

Nuclear Fission and Structure of Exotic Nuclei

JAEA, TOKAI, IBARAKI, JAPAN, MARCH 18-20,
2014

Systematics of fission-fragment yields in the $74 \leq Z \leq 94$ region and odd-even staggering

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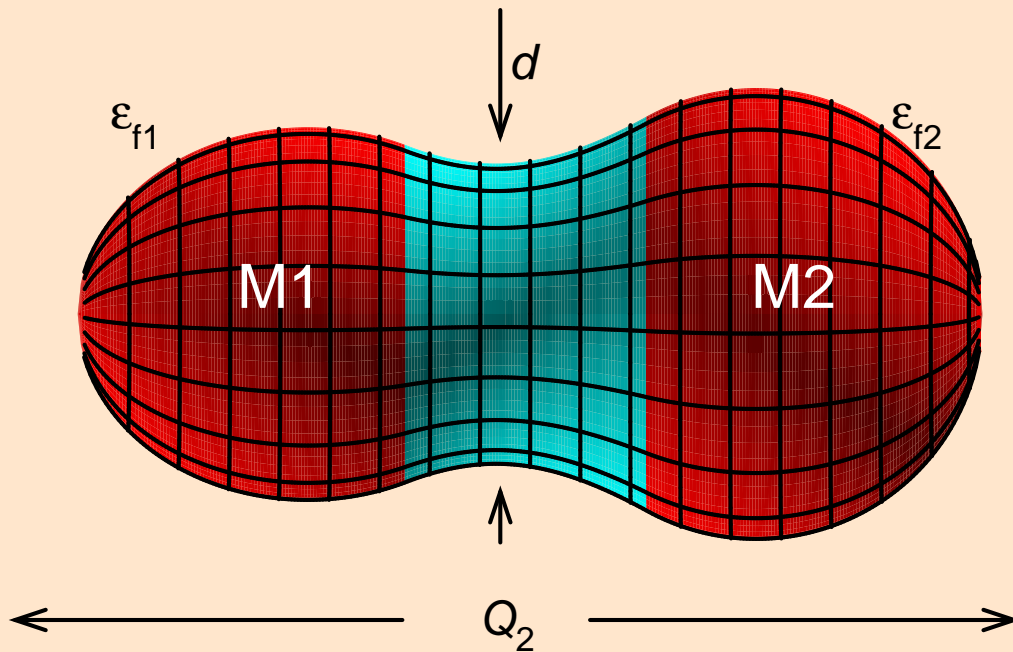
Collaborators on this and other projects:

W. D. Myers, J. Randrup(LBL), H. Sagawa (Aizu), S. Yoshida (Hosei), T. Ichikawa(YITP), A. J. Sierk(LANL), A. Iwamoto (JAEA), S. Aberg (Lund), R. Bengtsson (Lund), S. Gupta (IIT, Ropar), and many experimental groups (e. g. K.-L. Kratz (Mainz), H. Schatz (MSU), A. Andreyev (York), K. Nishio (JAEA) ...).

More details about masses, other projects (beta-decay, fission), associated ASCII data files, interactive access to data (type in Z, A and get specific data, contour maps) and figures are at

<http://t2.lanl.gov/nis/molleretal/>

Five Essential Fission Shape Coordinates

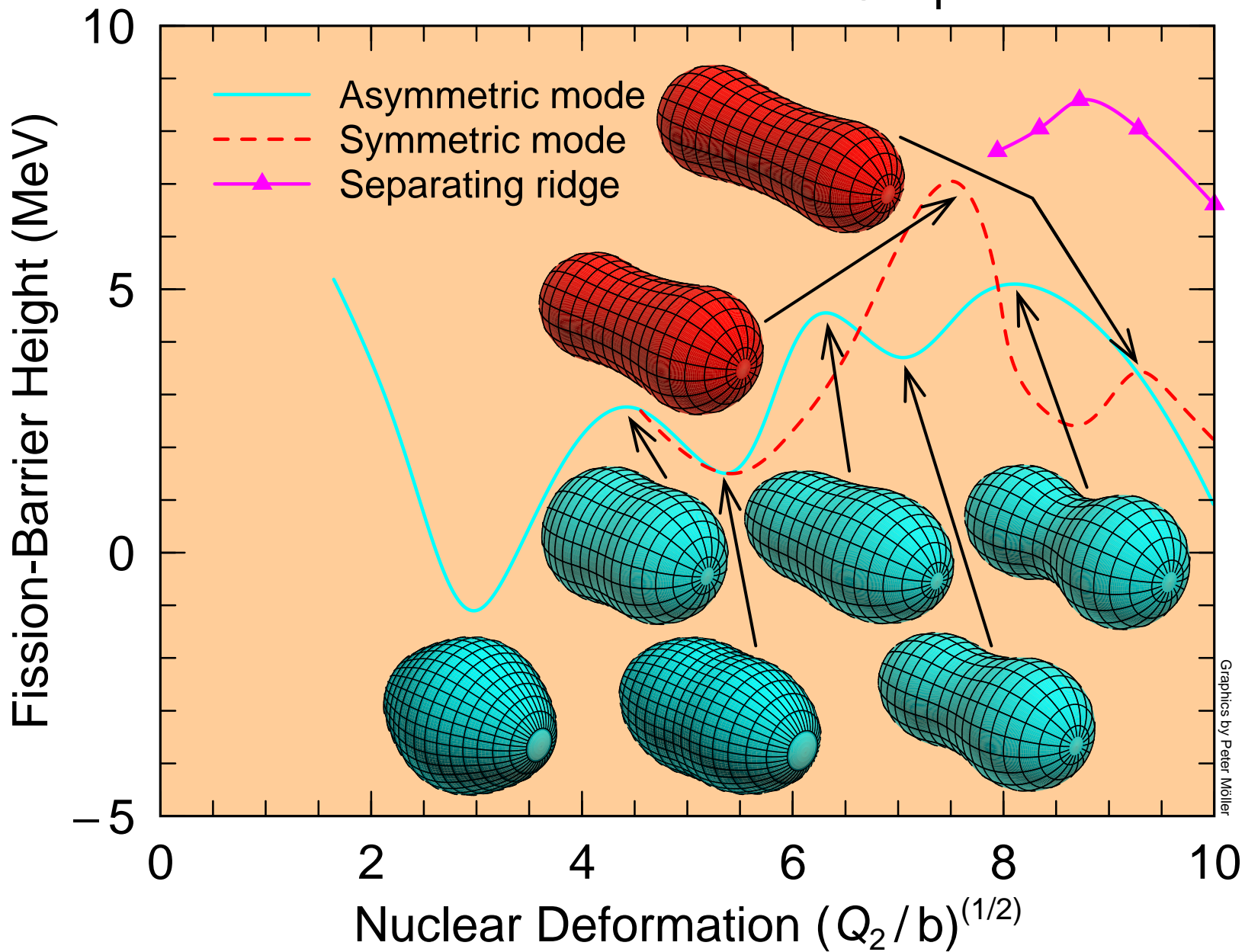


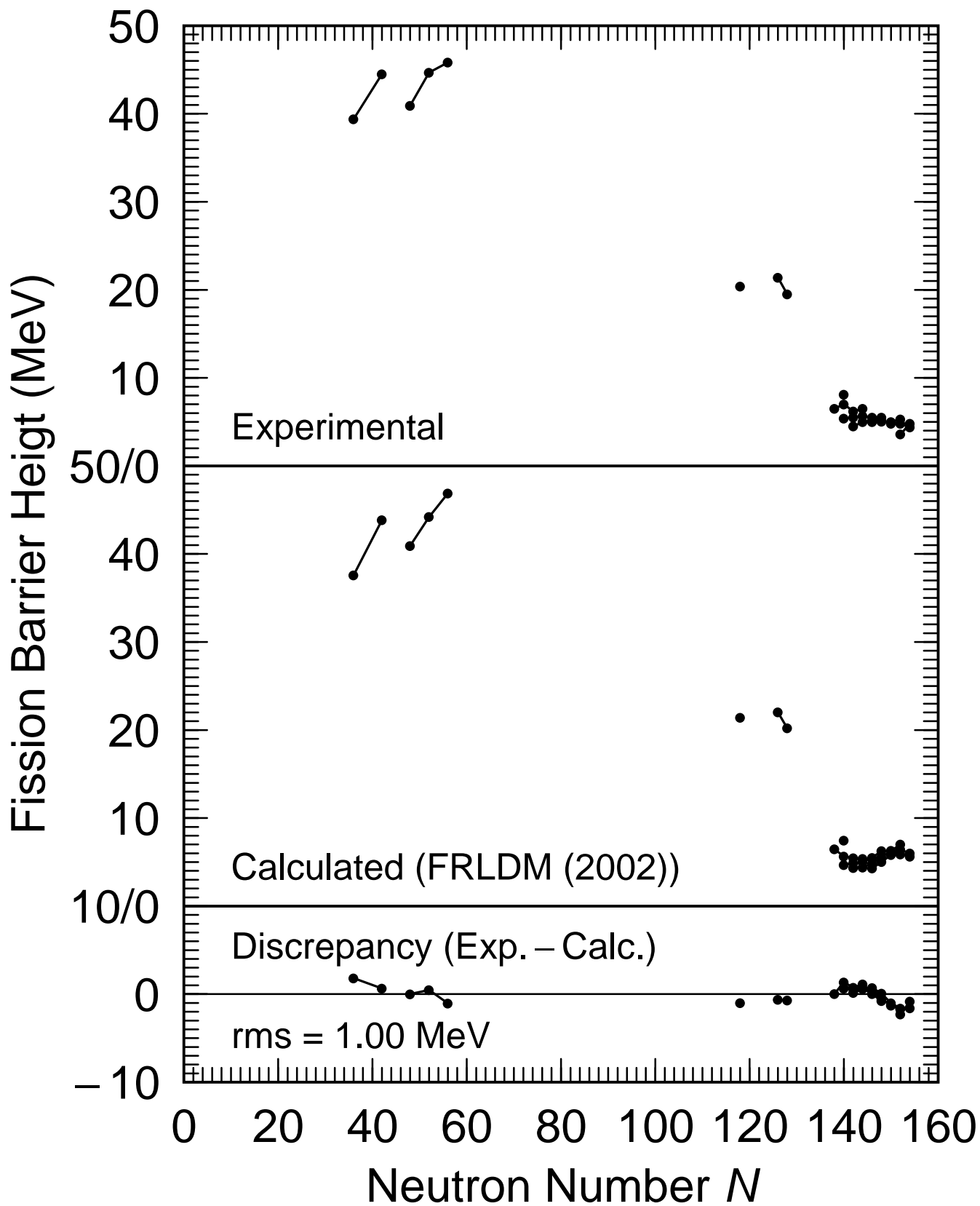
45	Q_2 ~ Elongation (fission direction)
⊗	
35	α_g ~ $(M1-M2)/(M1+M2)$ Mass asymmetry
⊗	
15	ϵ_{f1} ~ Left fragment deformation
⊗	
15	ϵ_{f2} ~ Right fragment deformation
⊗	
15	d ~ Neck

⇒ 5 315 625 grid points – 306 300 unphysical points

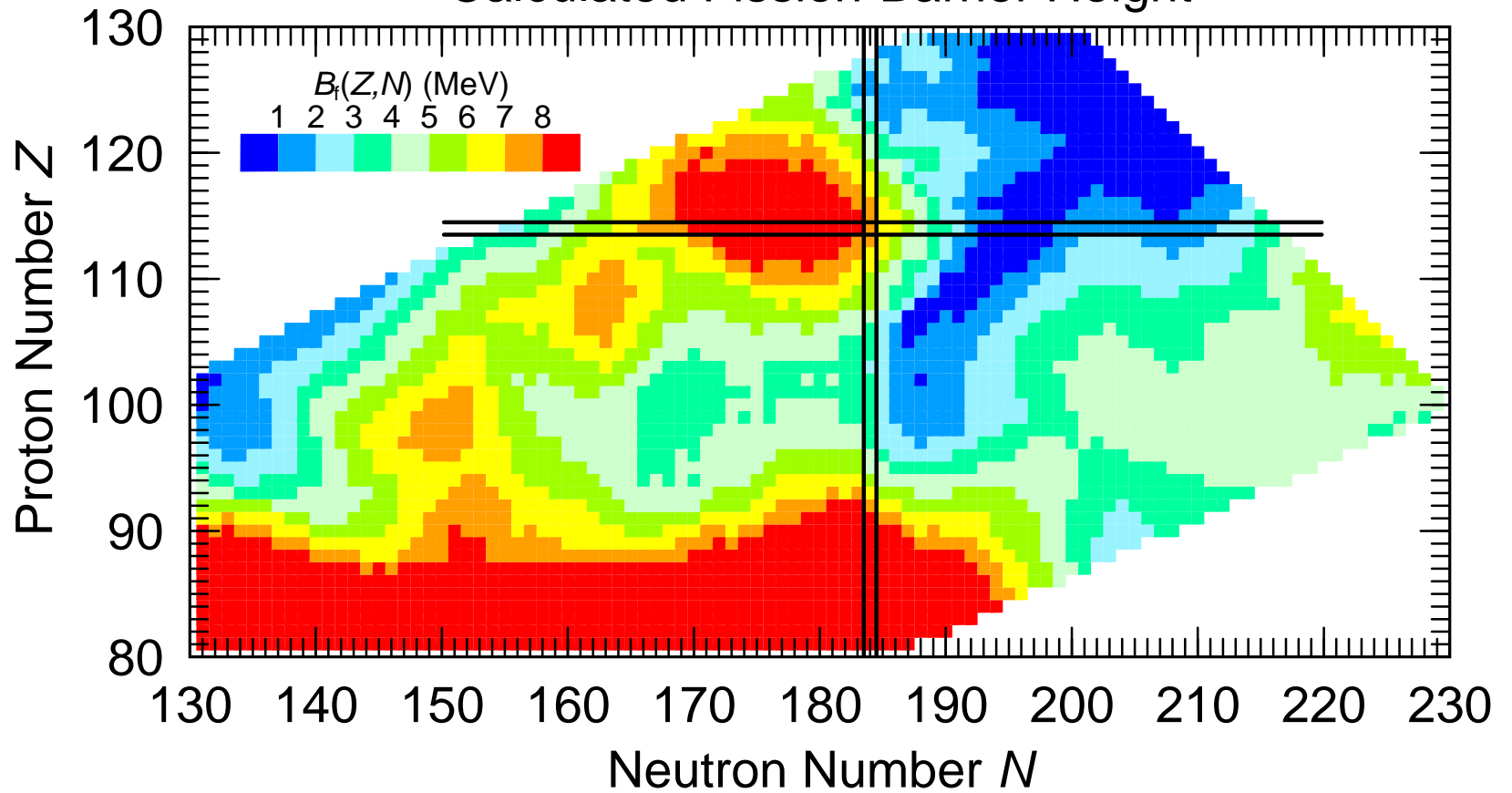
⇒ **5 009 325 physical grid points**

Fission Barrier and Associated Shapes for ^{232}Th

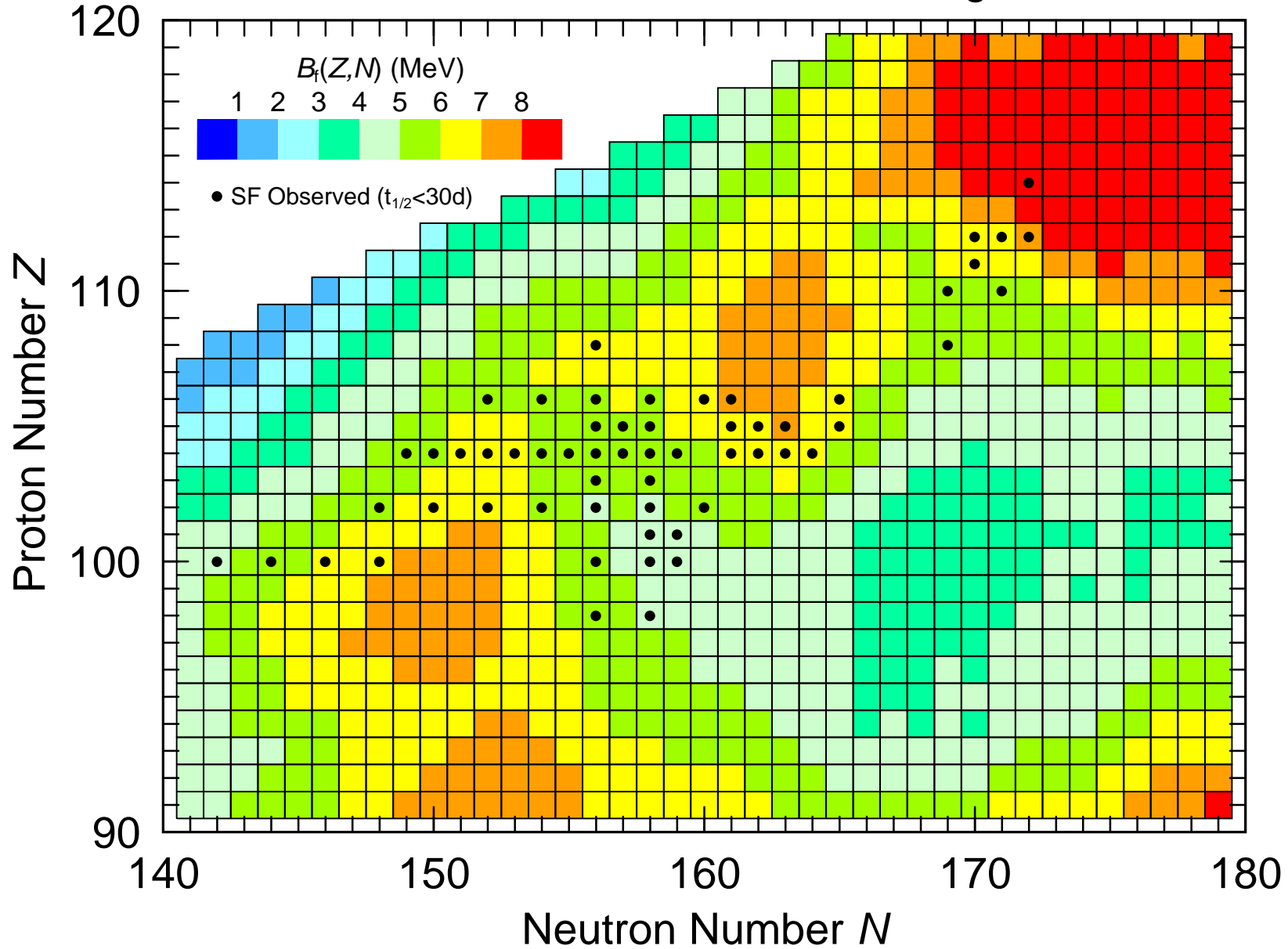




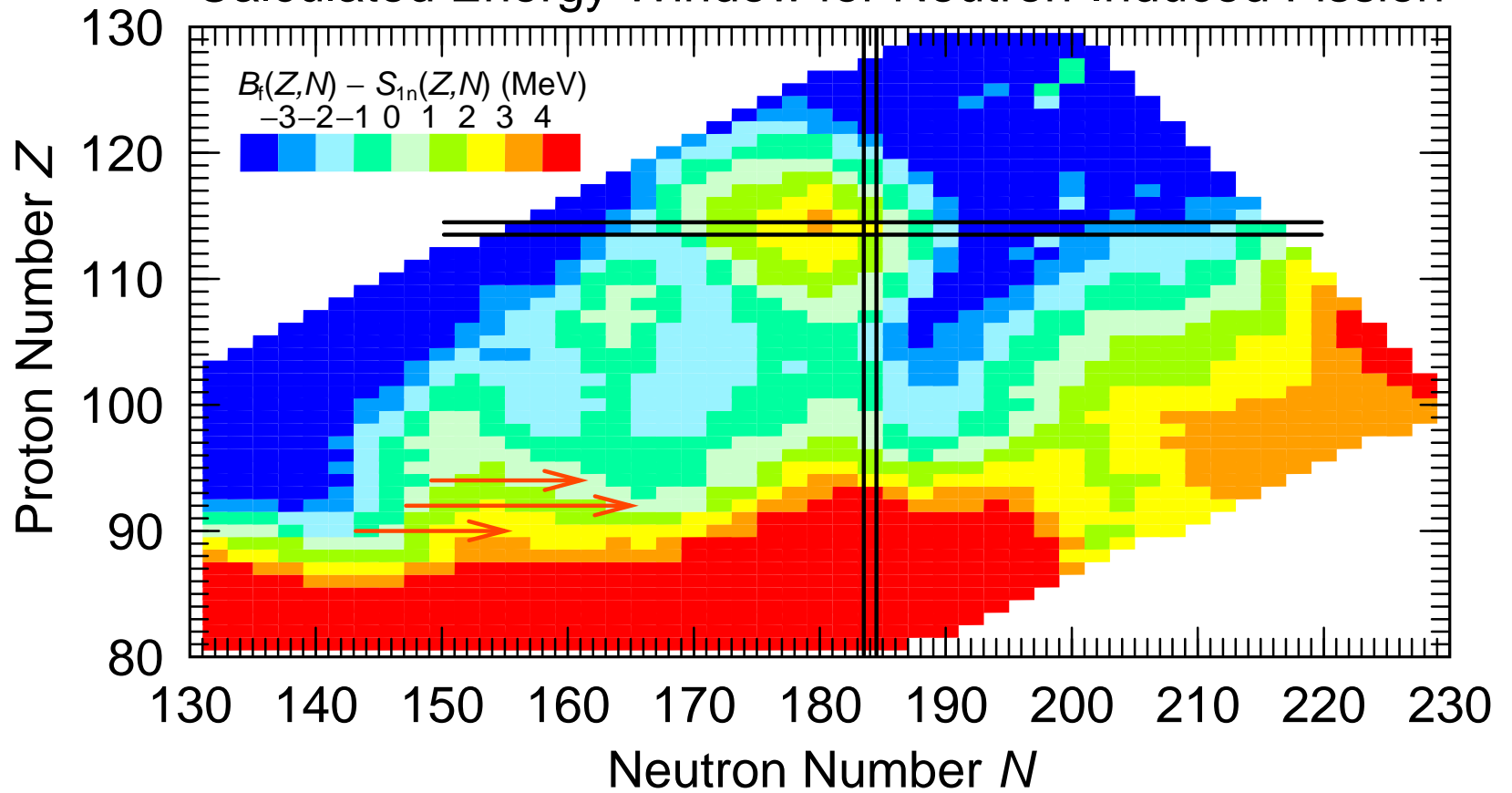
Calculated Fission-Barrier Height

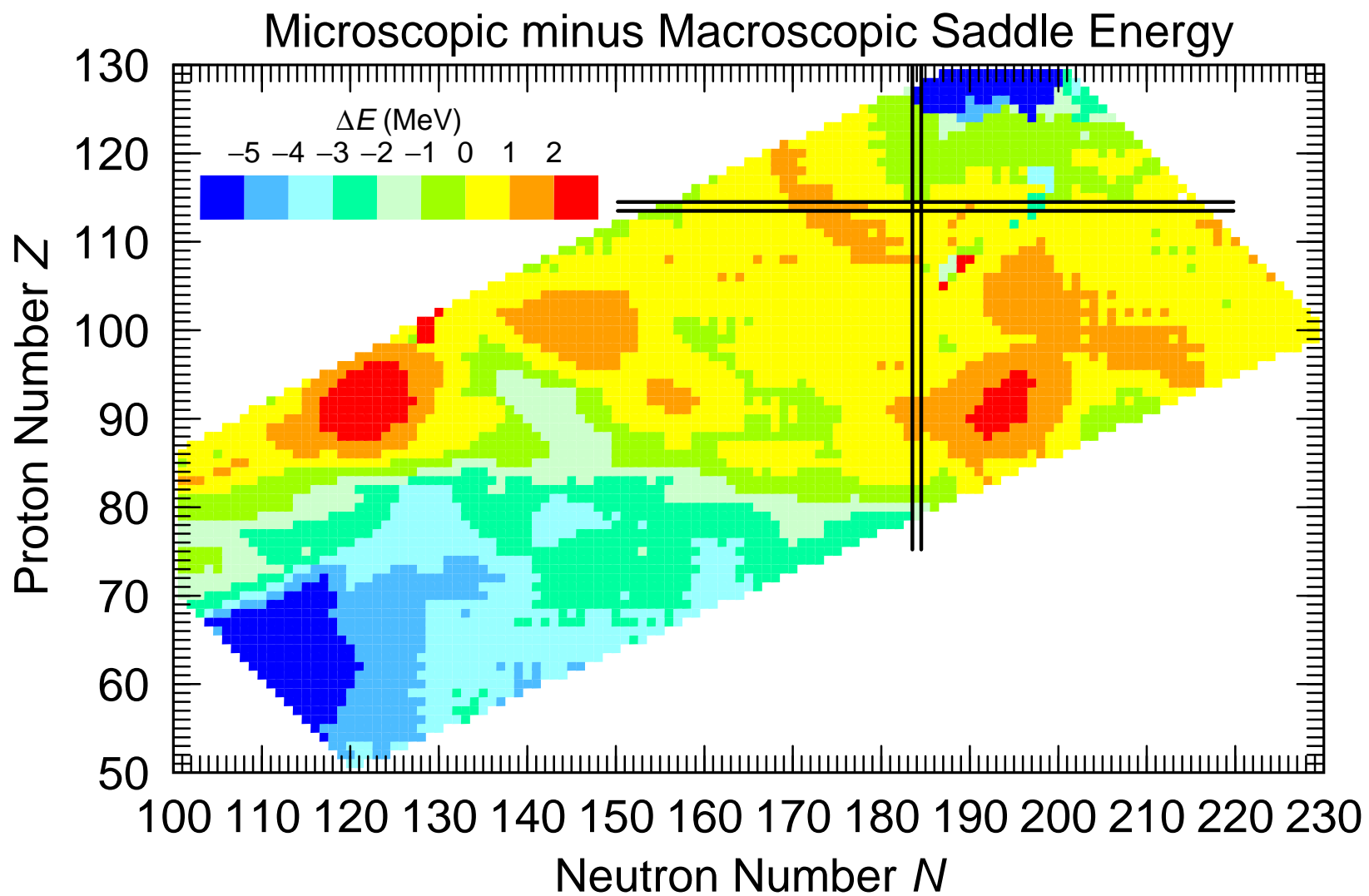


Calculated Fission-Barrier Height

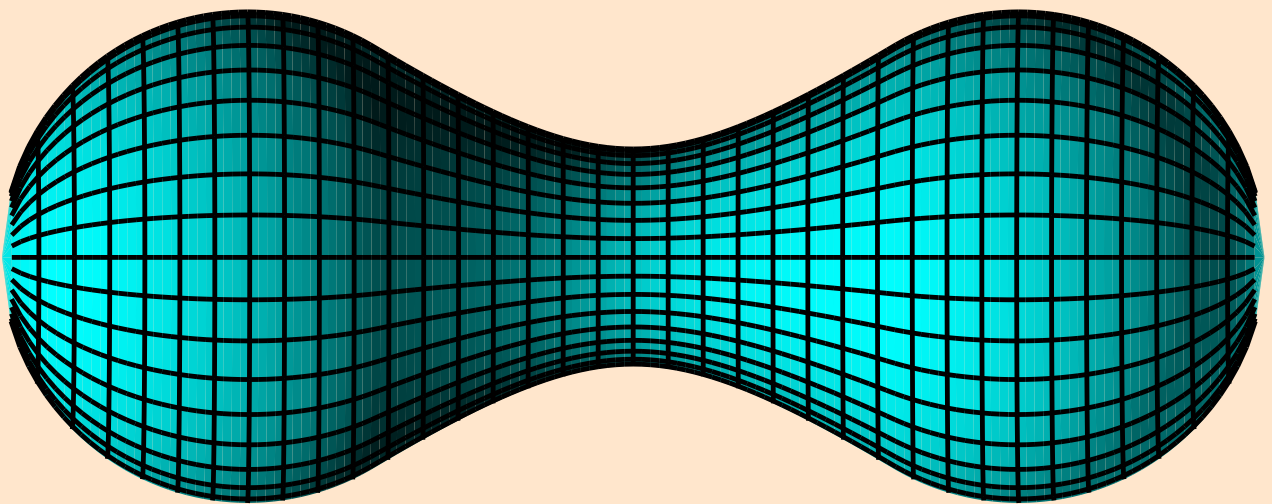


Calculated Energy Window for Neutron-Induced Fission

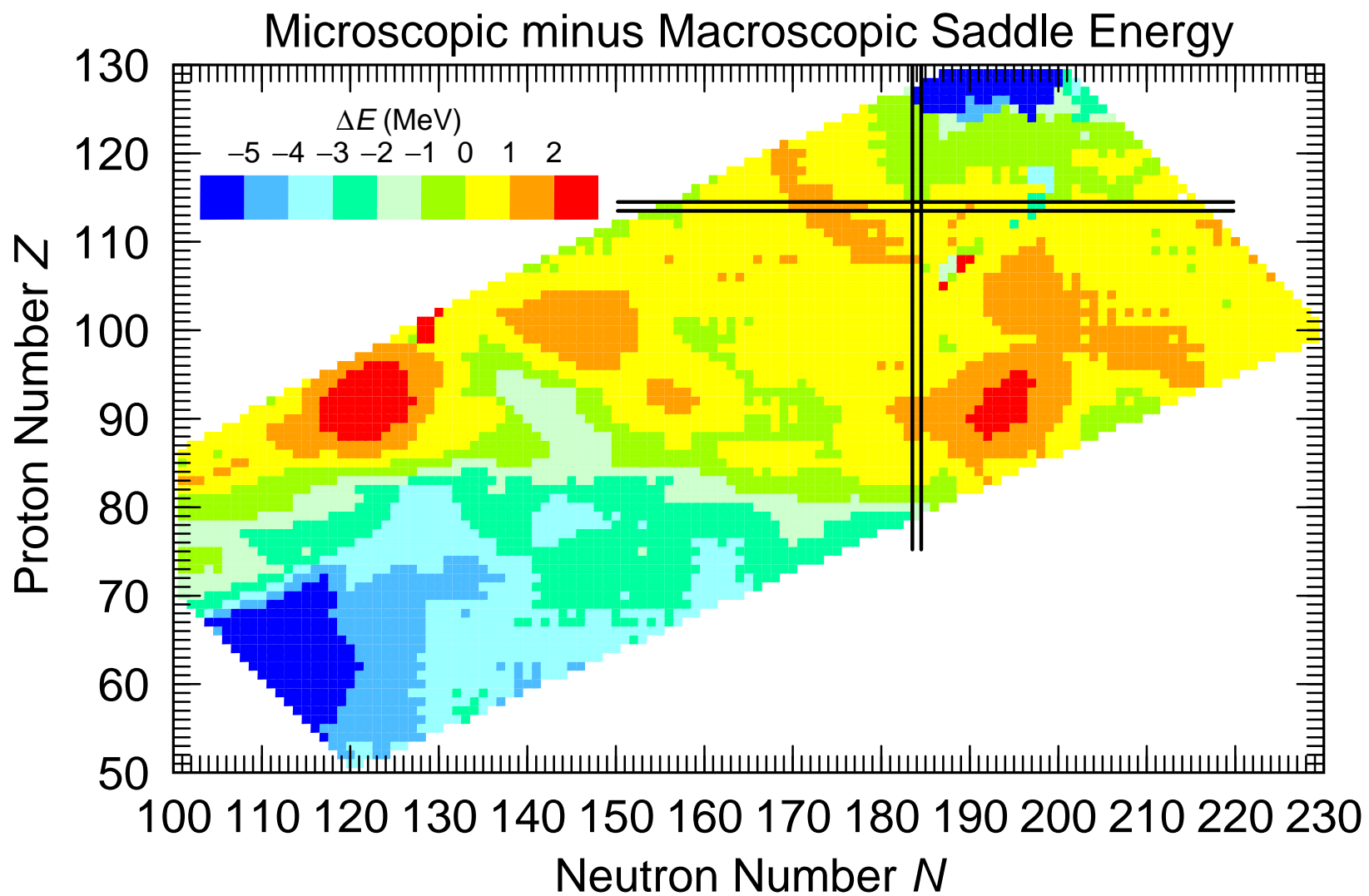




¹⁷¹Nd Saddle Shape

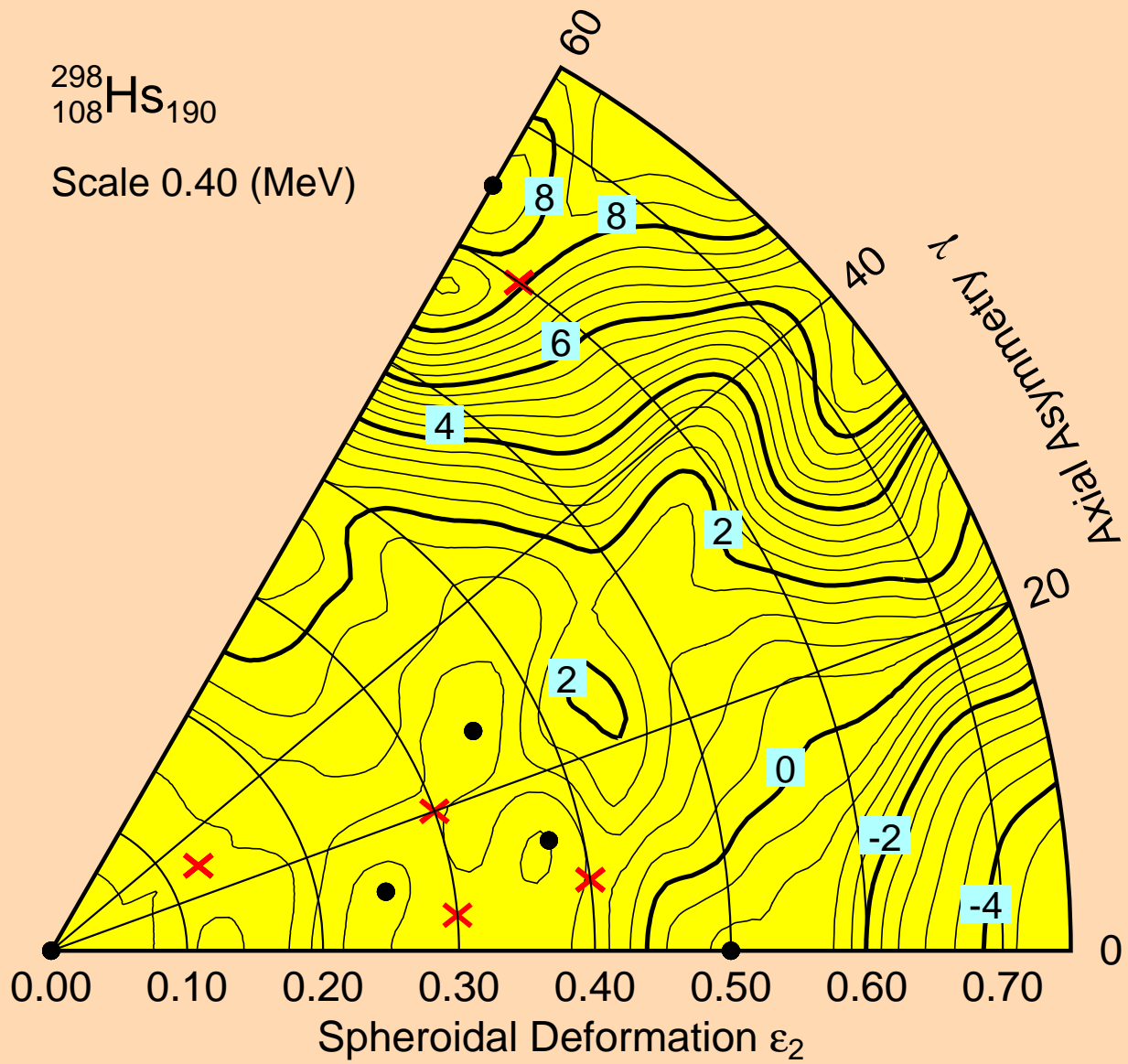


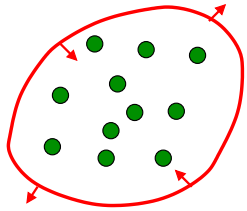
$$\sigma_1 = 3.1404 \quad \sigma_2 = -0.4848 \quad \sigma_3 = 1.0000 \quad \alpha_2 = 0.0000 \quad \alpha_3 = 0.0000$$



$^{298}_{108}\text{Hs}_{190}$

Scale 0.40 (MeV)





Brownian shape motion

Nuclear deformation energy: $E_{\text{def}}(i,j,k,l,m)$

Bias potential: $V_{\text{bias}}(i) = V_0 (Q_0/Q_2)^2$

Level density parameter: $a_A = A/(8 \text{ MeV})$

Temperature T : $E^* - E_{\text{def}} = a_A T^2$

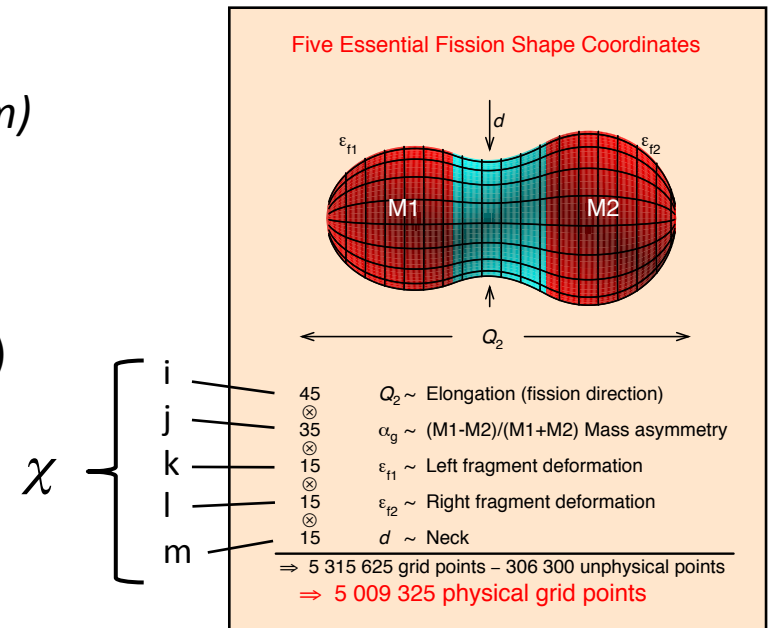
$$\Rightarrow V(\chi) = E_{\text{def}} + V_{\text{bias}}$$

Metropolis walk:

Change shape: $\chi \rightarrow \chi'$?

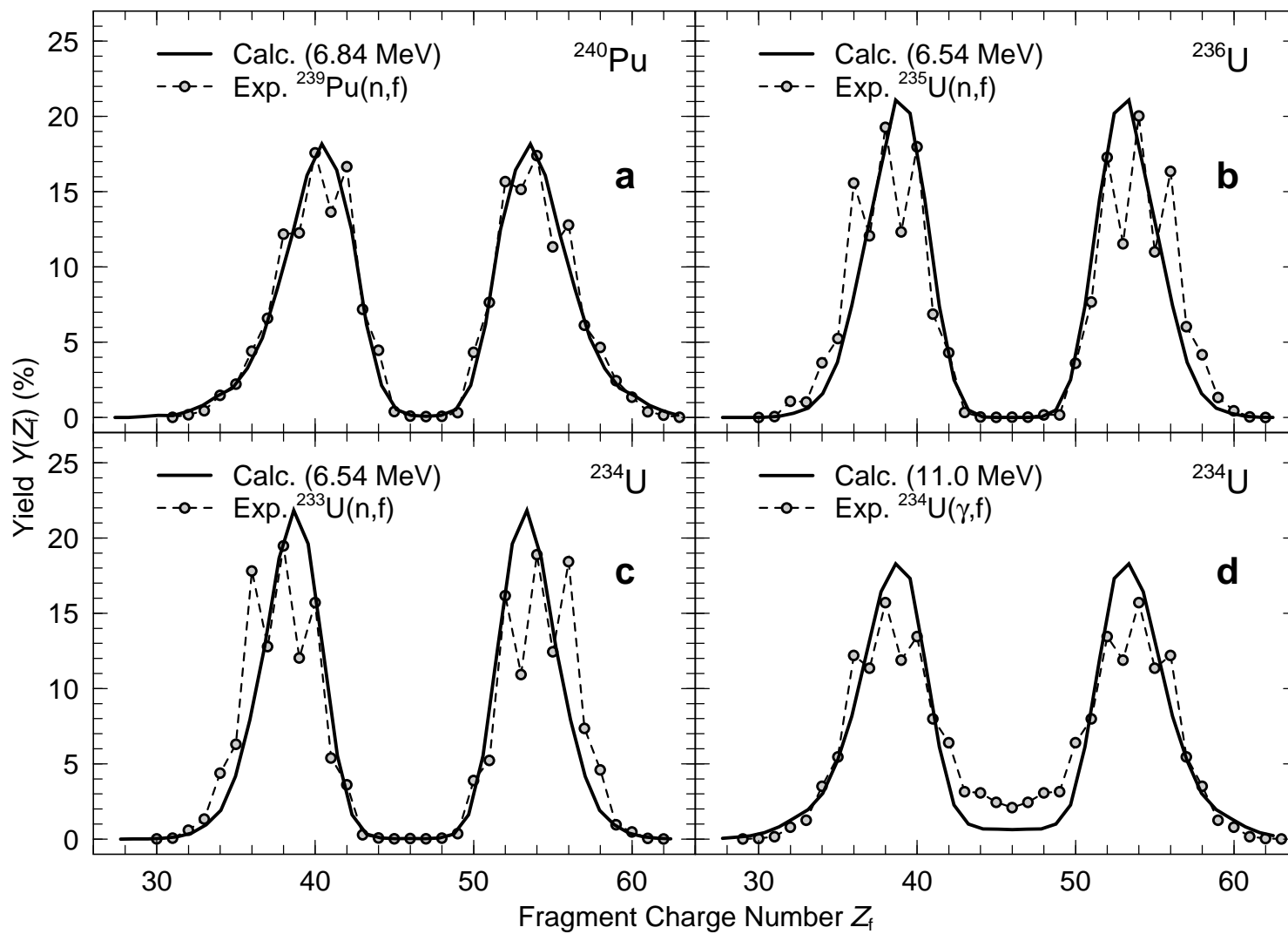
$$\begin{cases} V(\chi') < V(\chi): \text{ move with } P = 1 \\ V(\chi') > V(\chi): \text{ move with } P = \exp(-\Delta V/T) \end{cases}$$

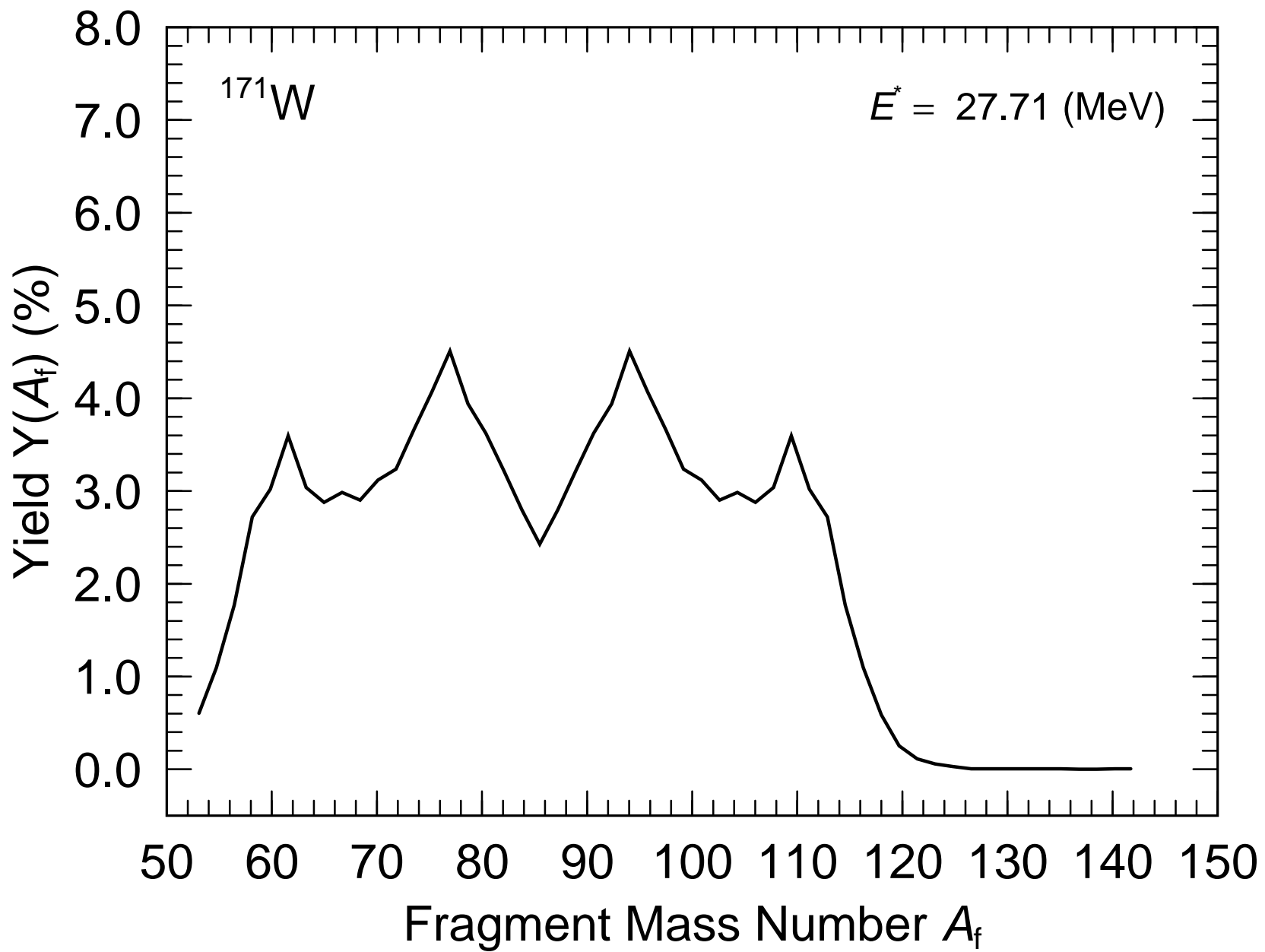
Scission: Critical neck radius $c_0 \approx 2.5 \text{ fm}$

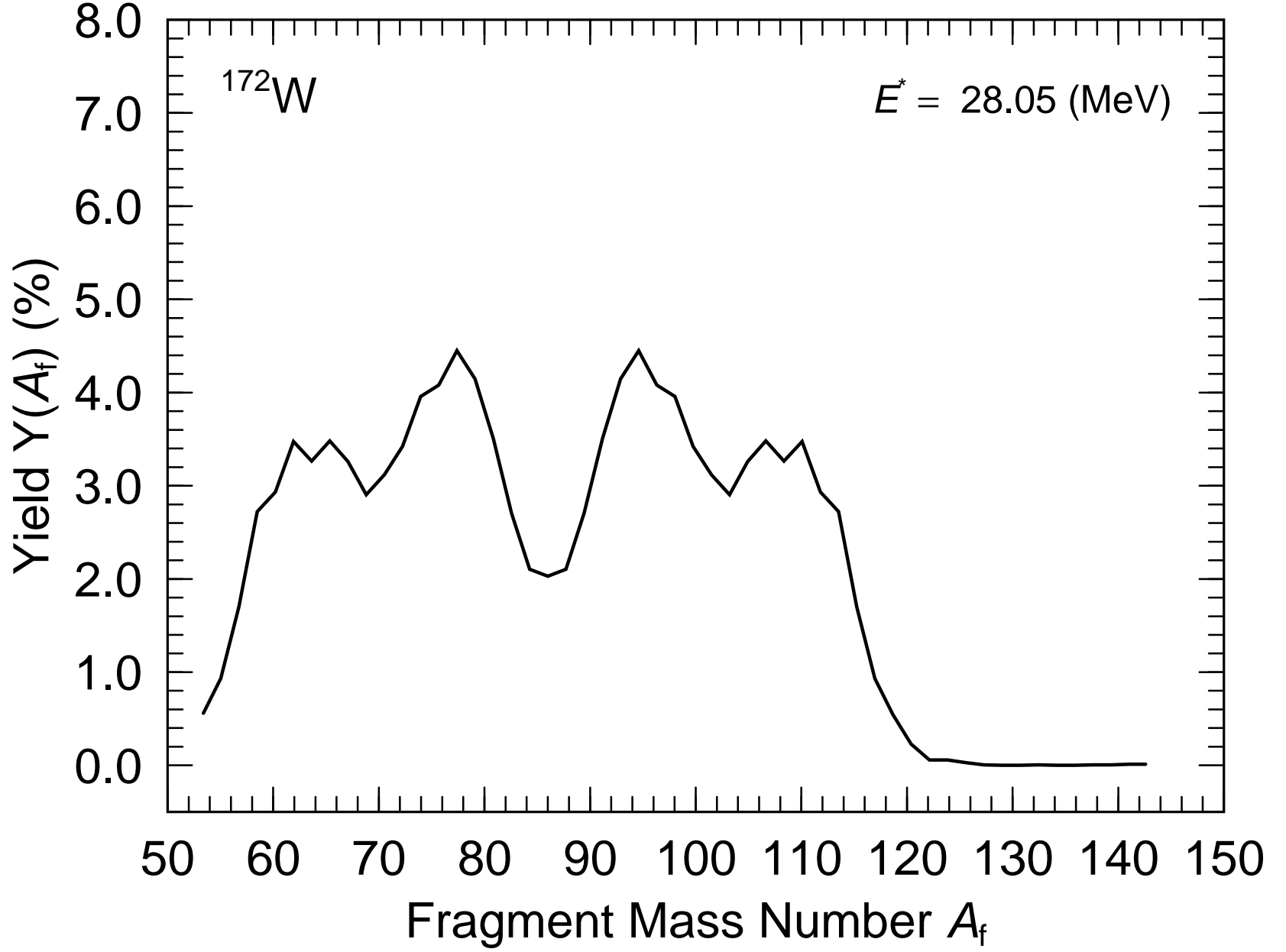


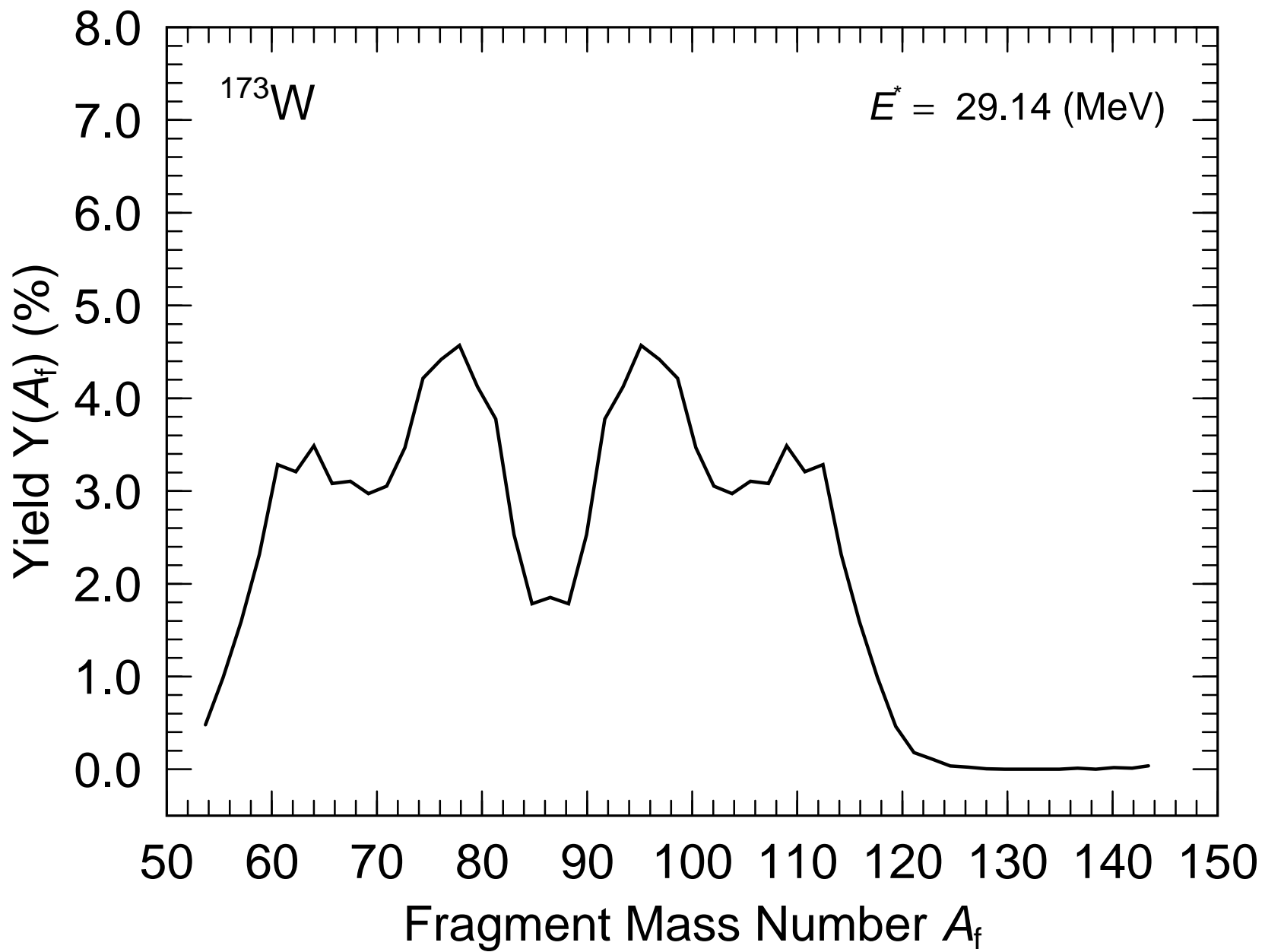
P. Möller *et al*, Nature 409 (2001) 785

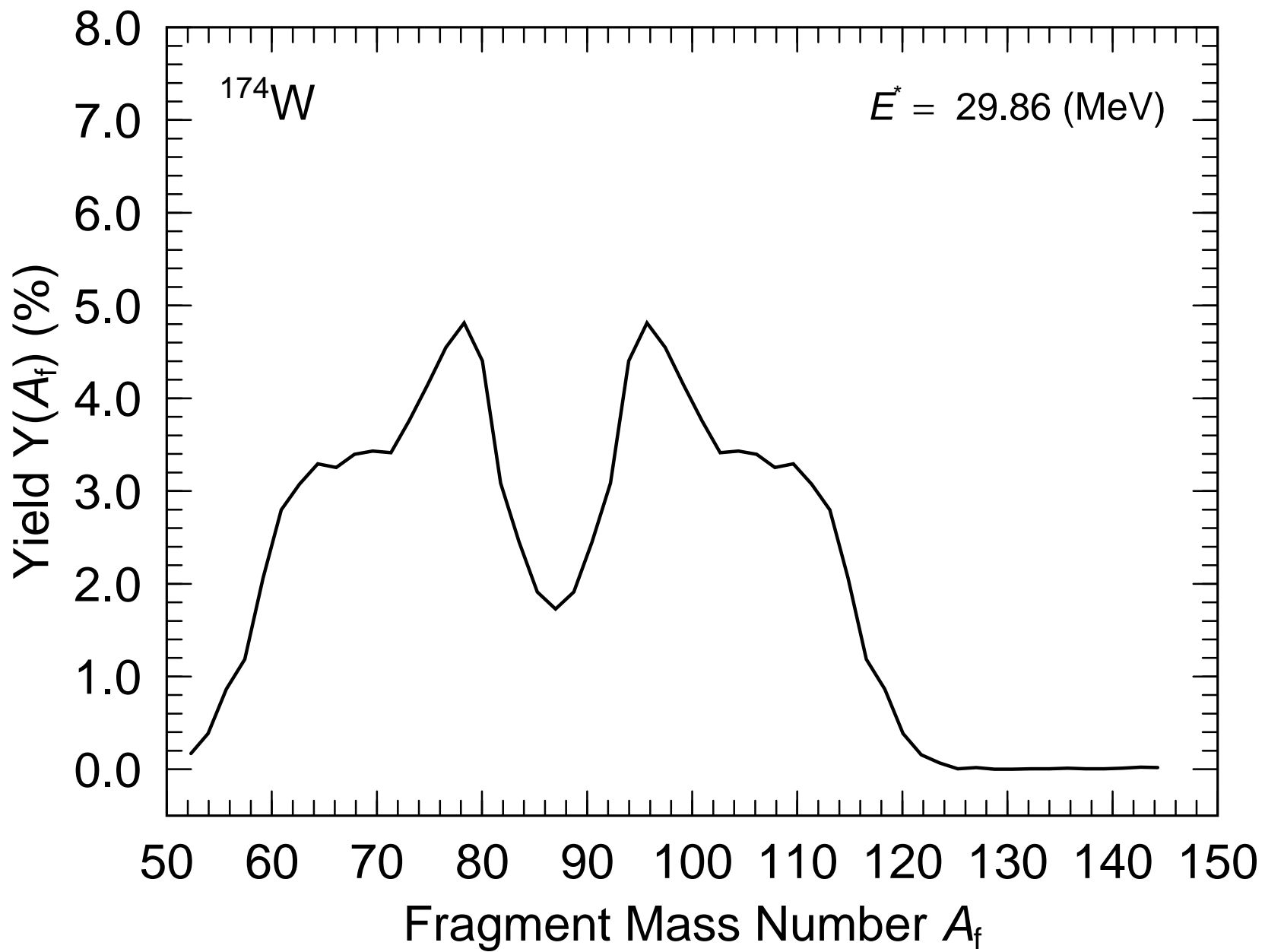
N. Metropolis *et al*, J Chem Phys 26 (1953) 1087

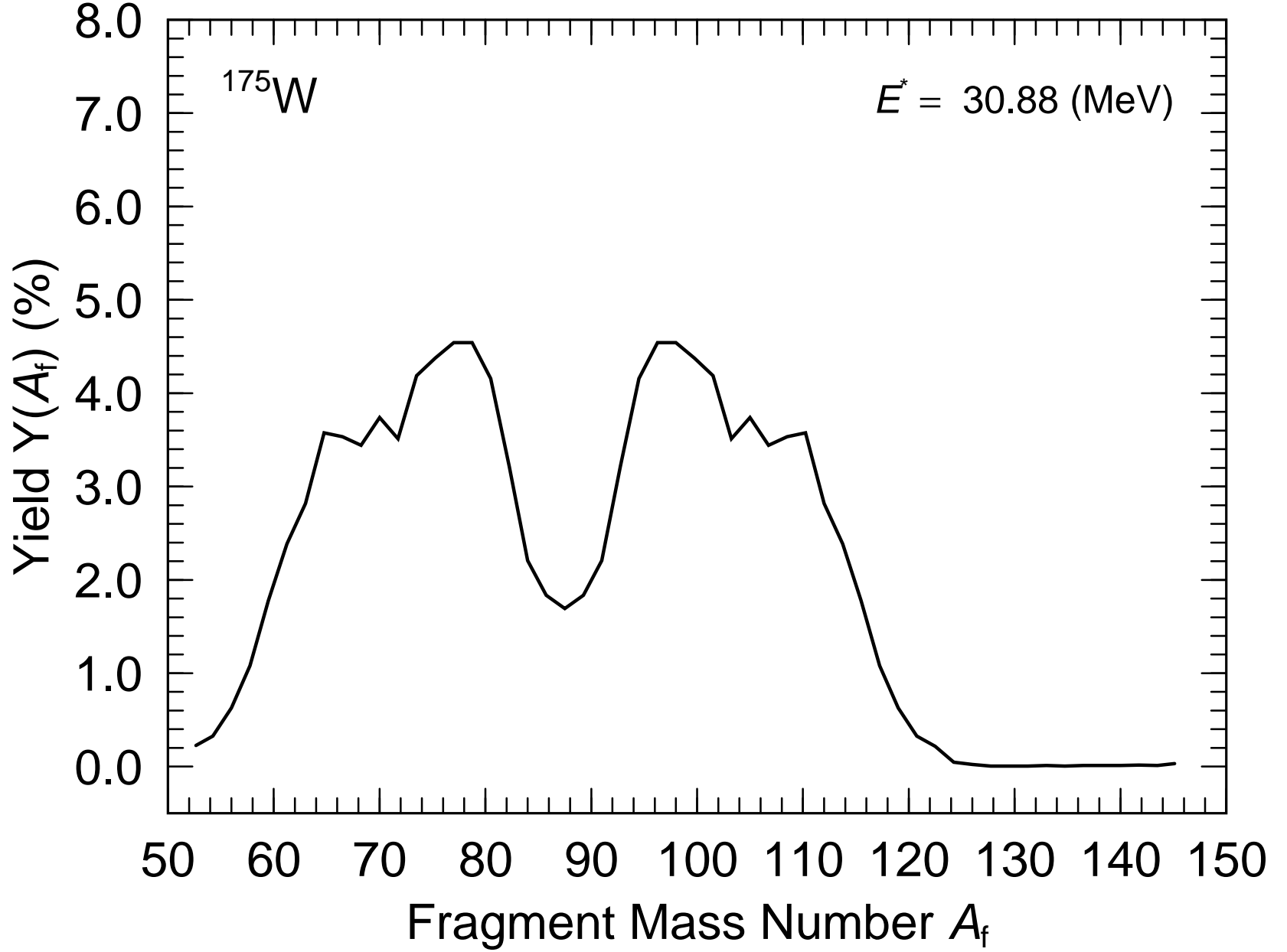


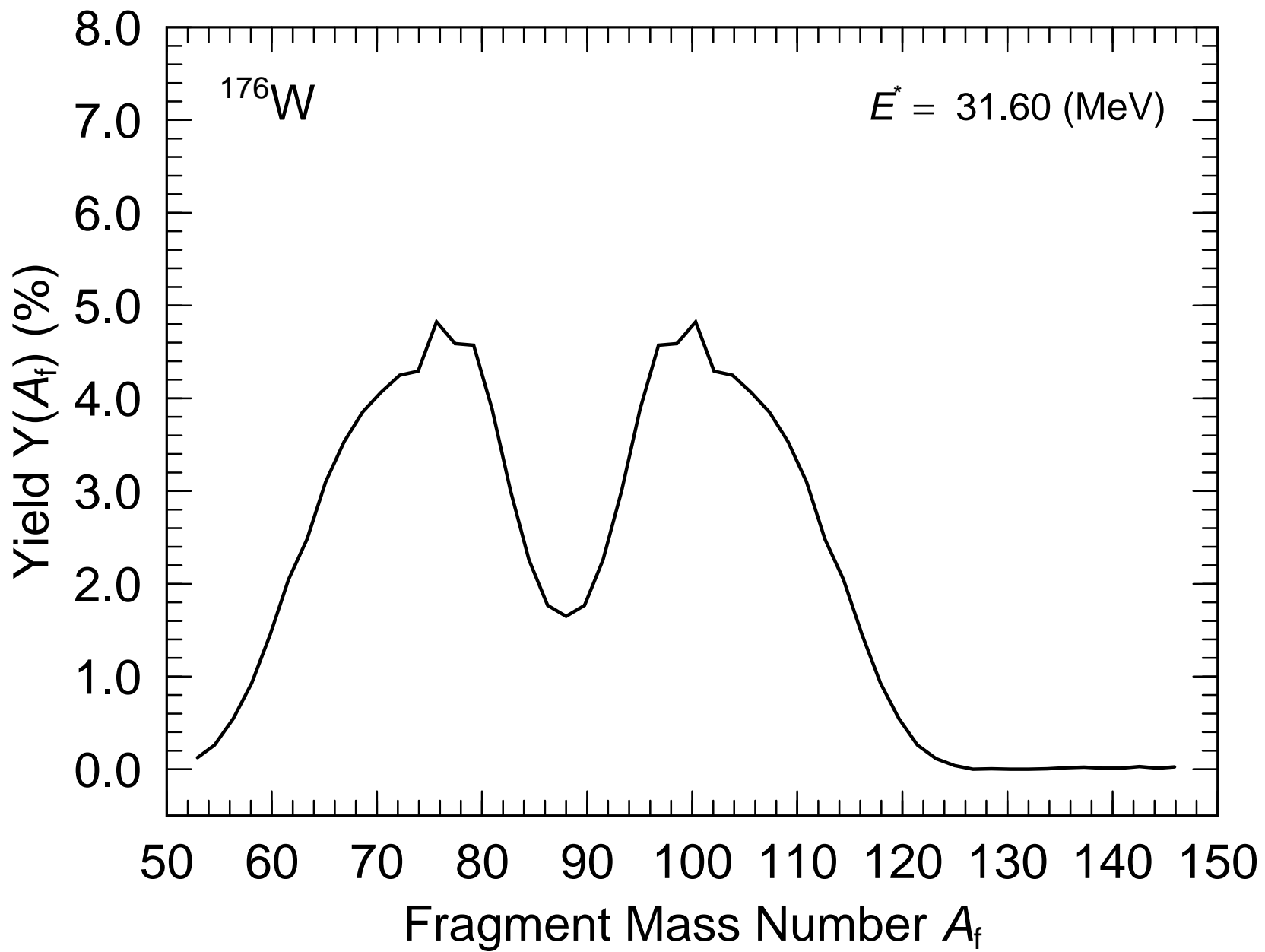


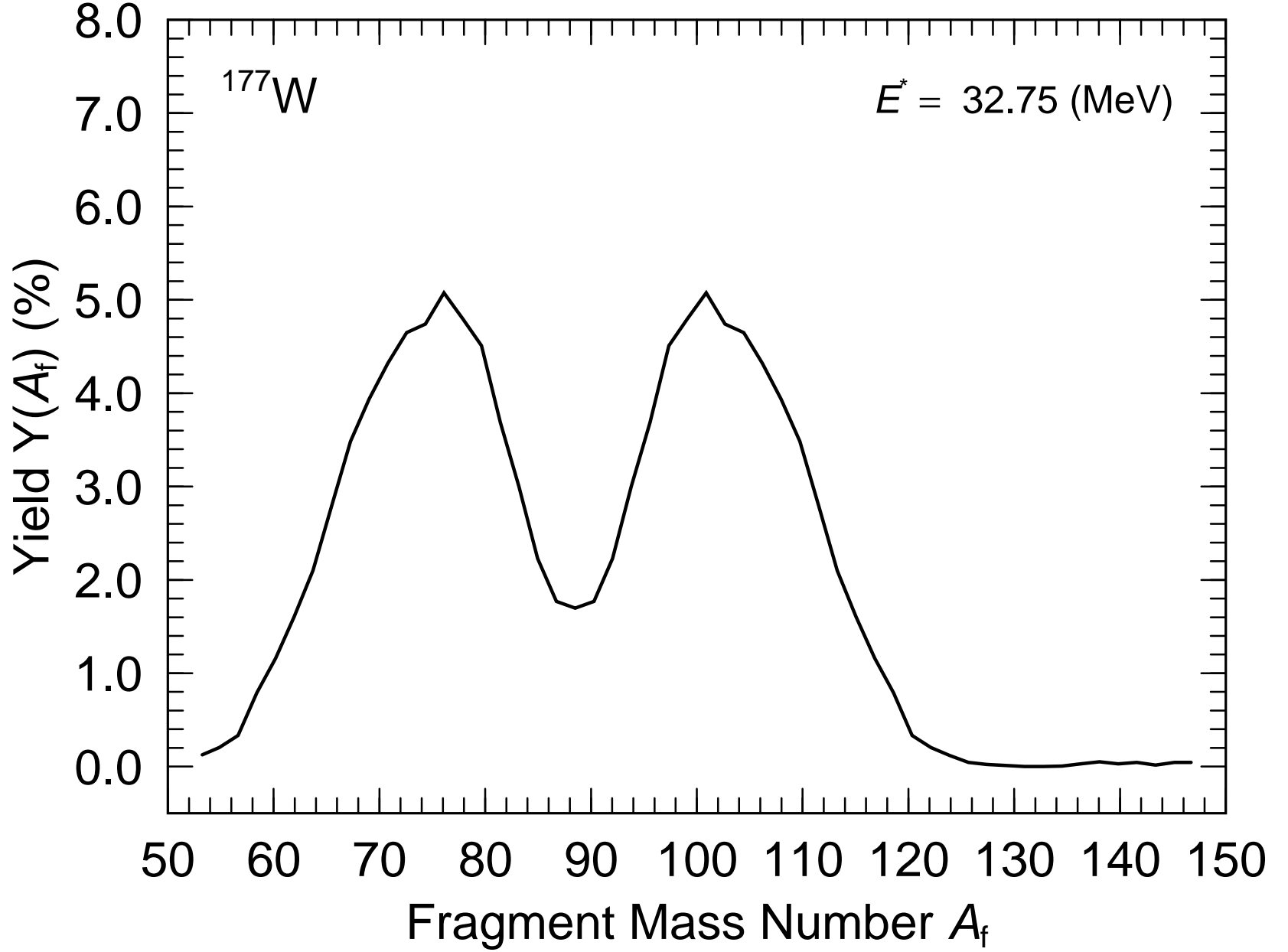


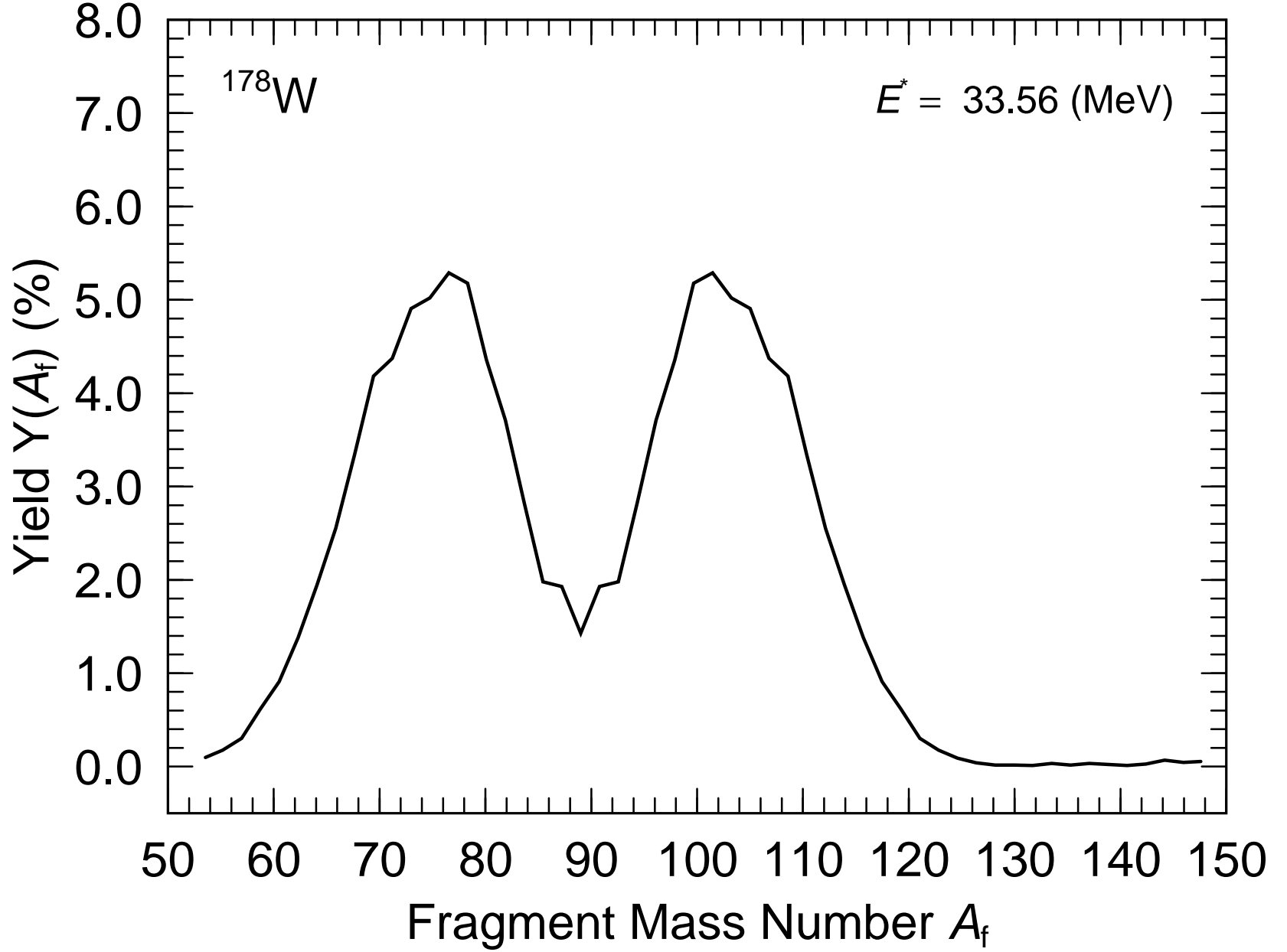


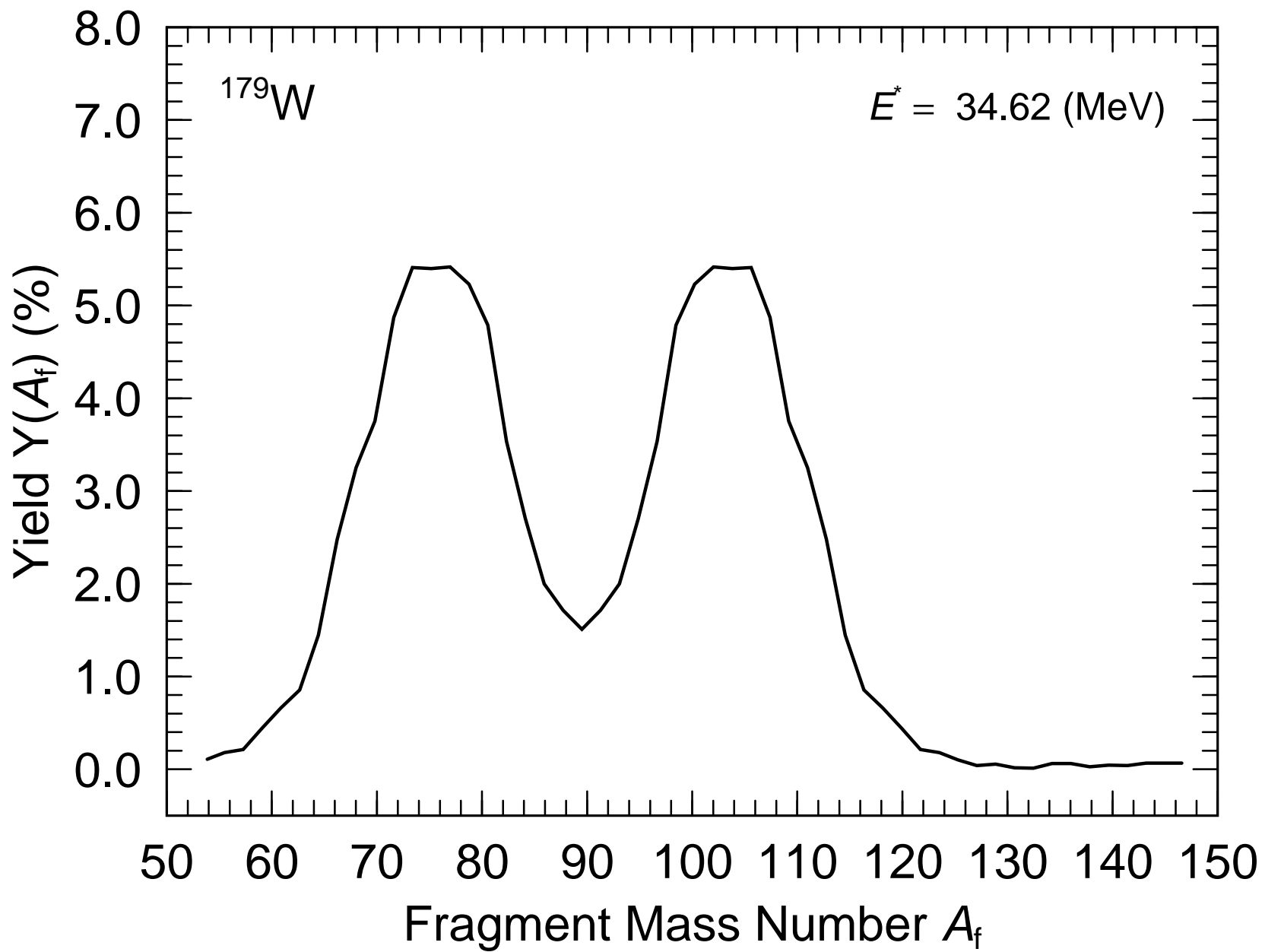


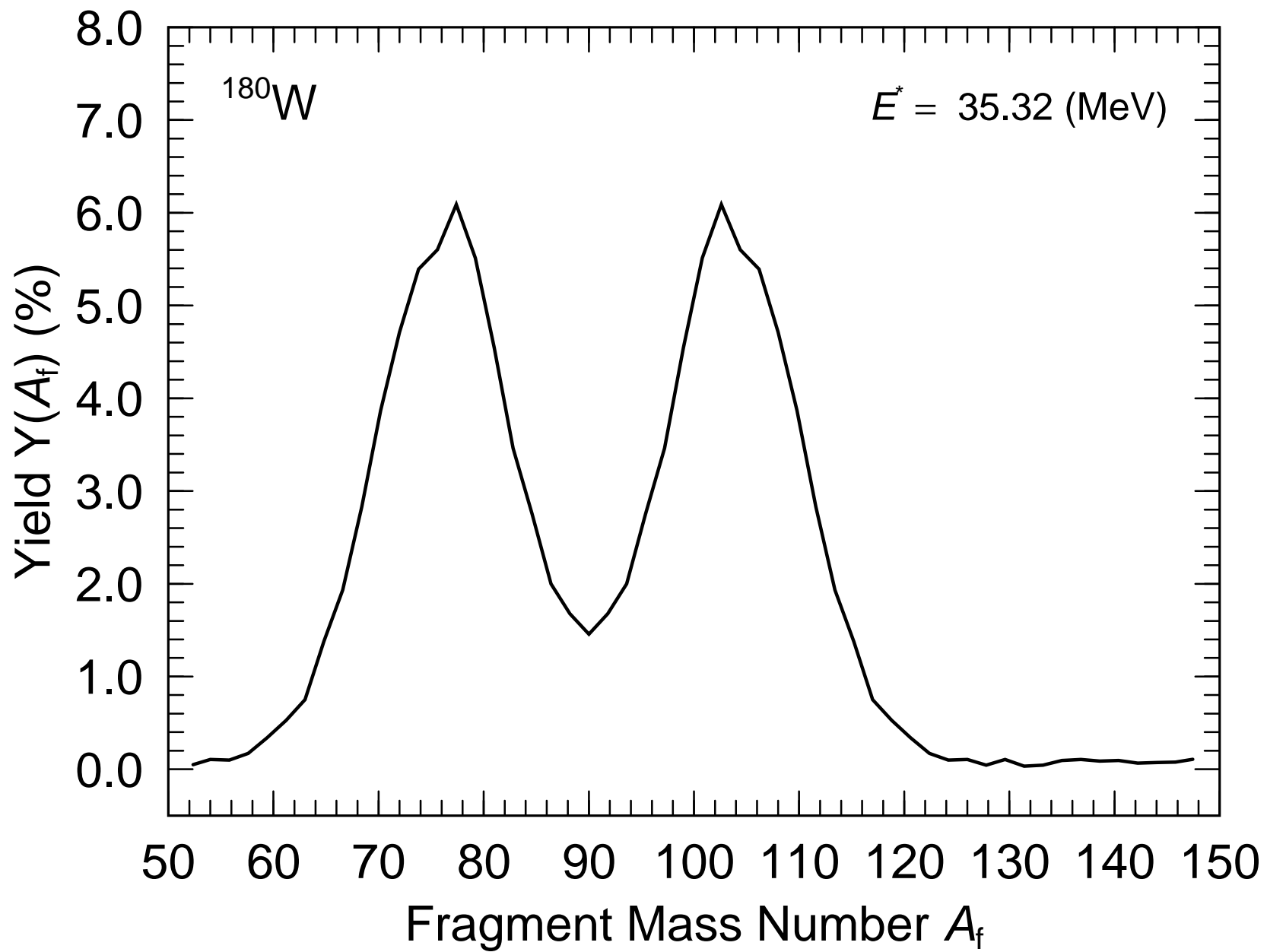


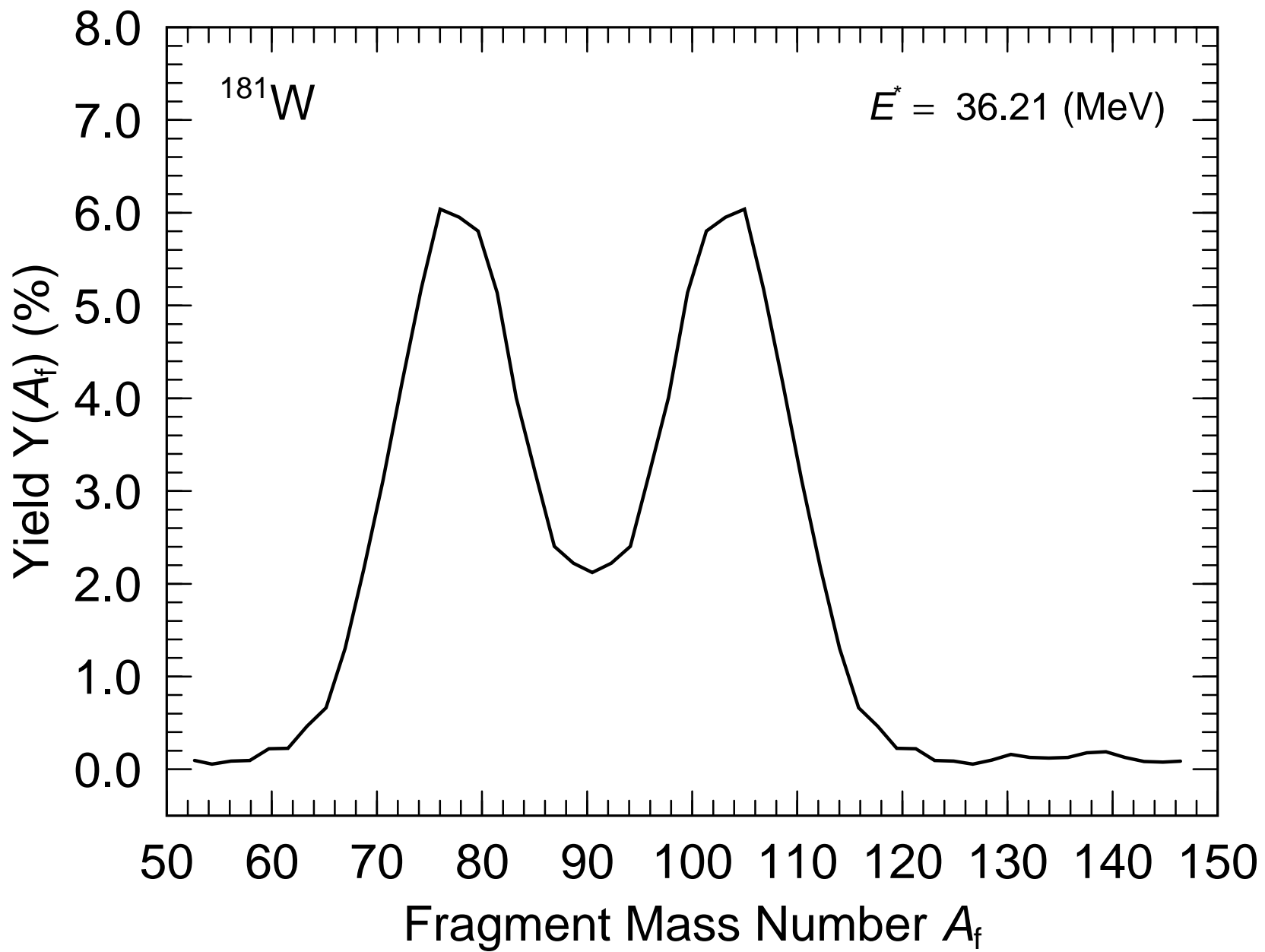


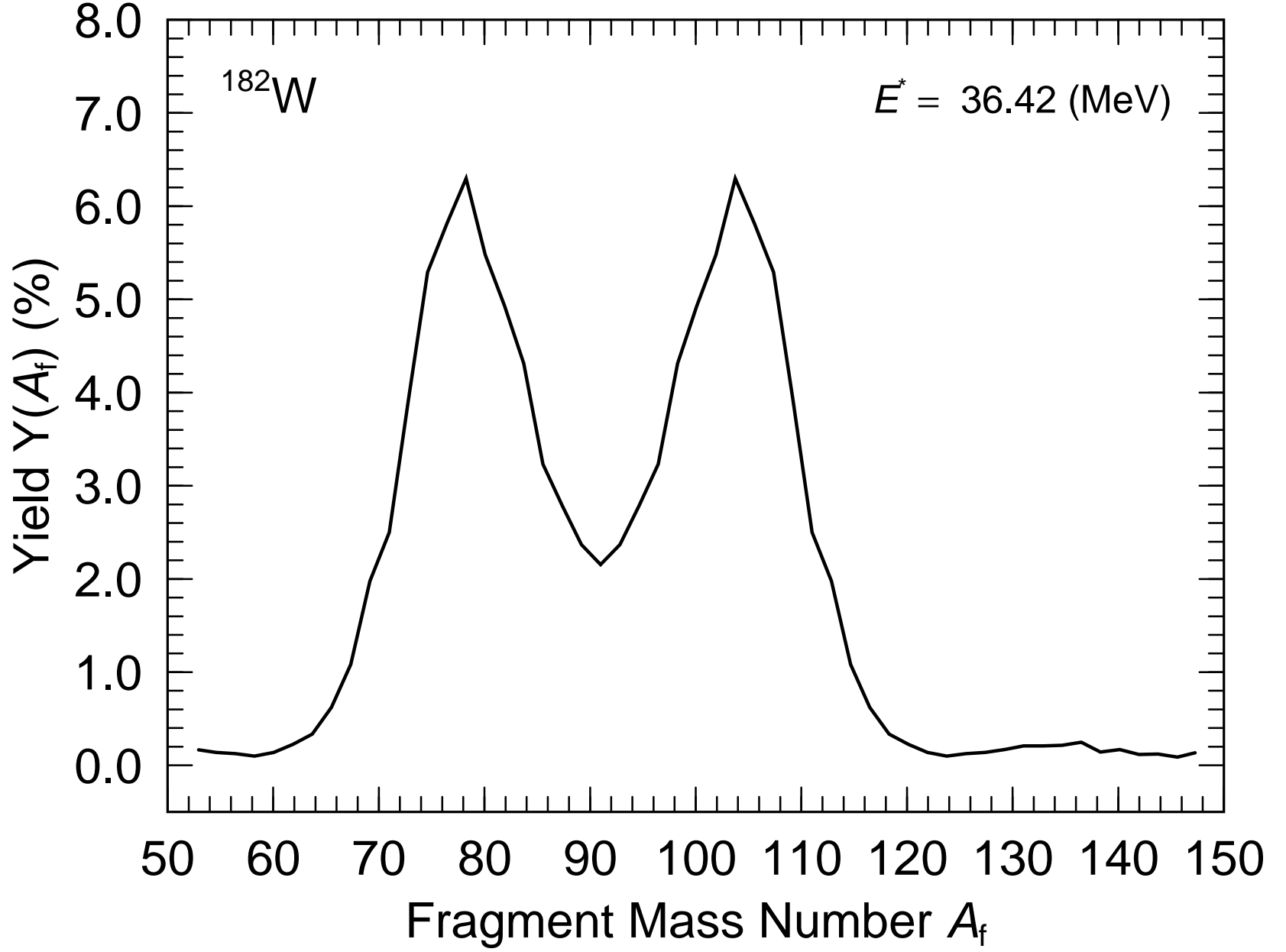


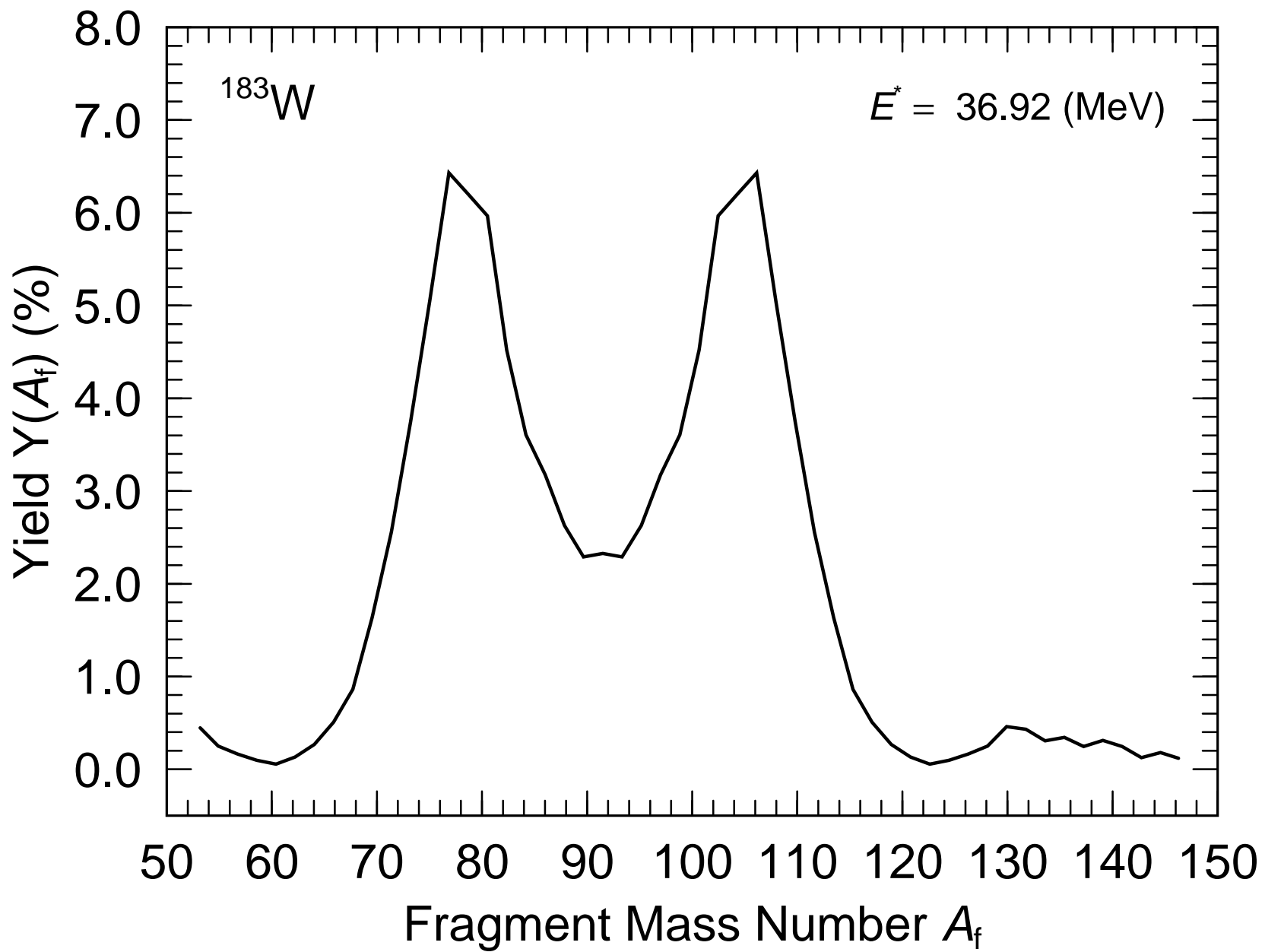


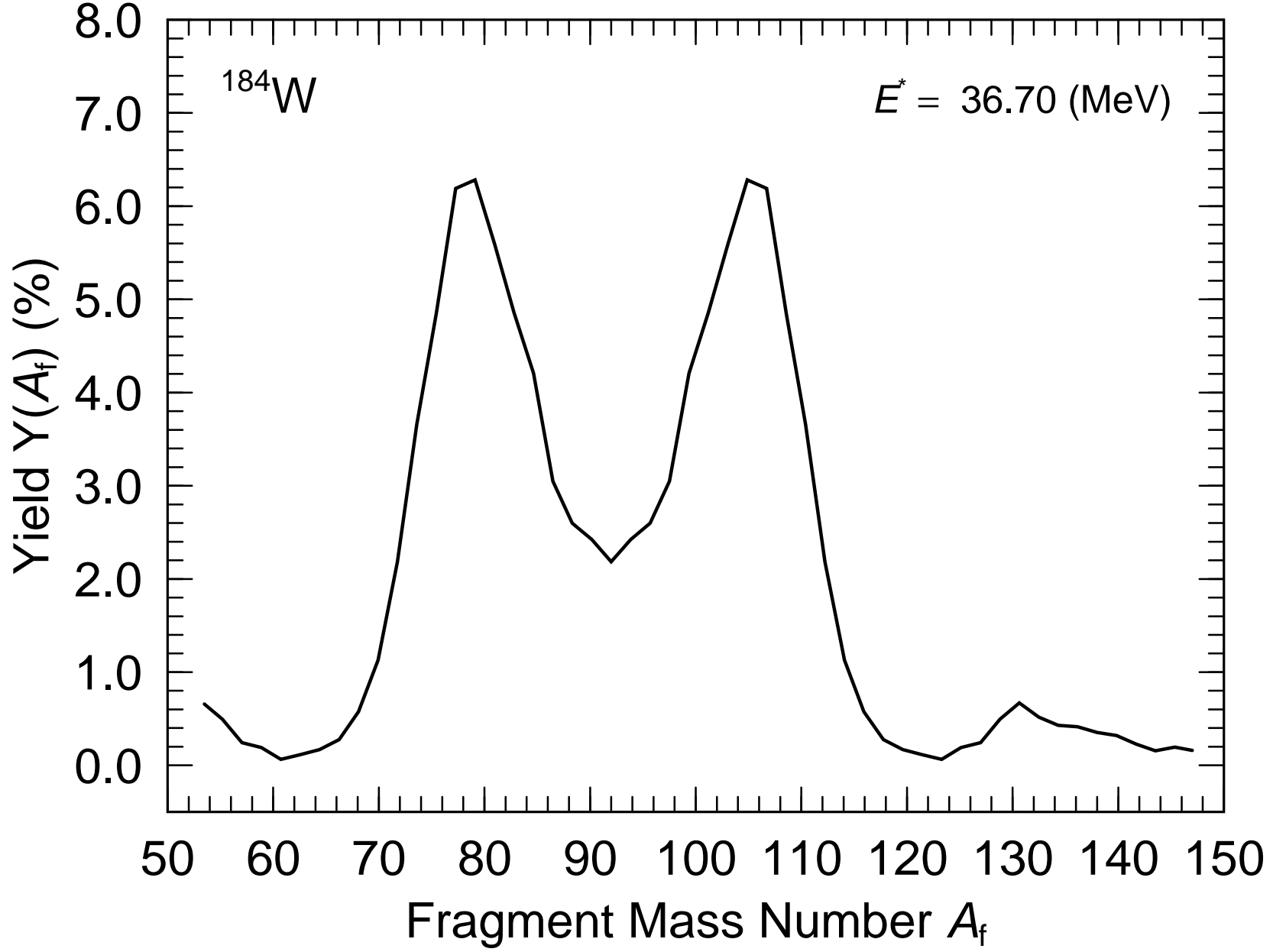


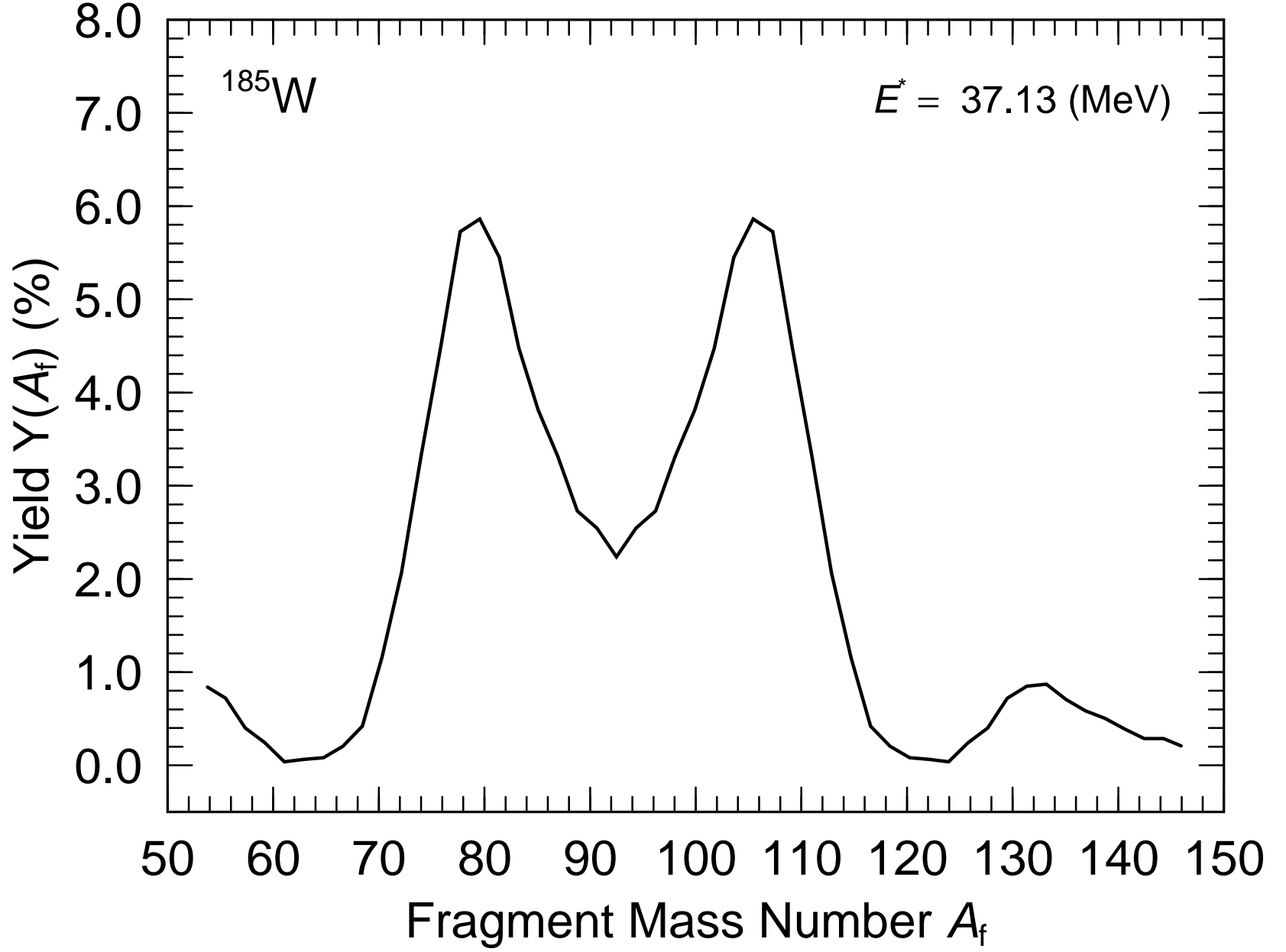


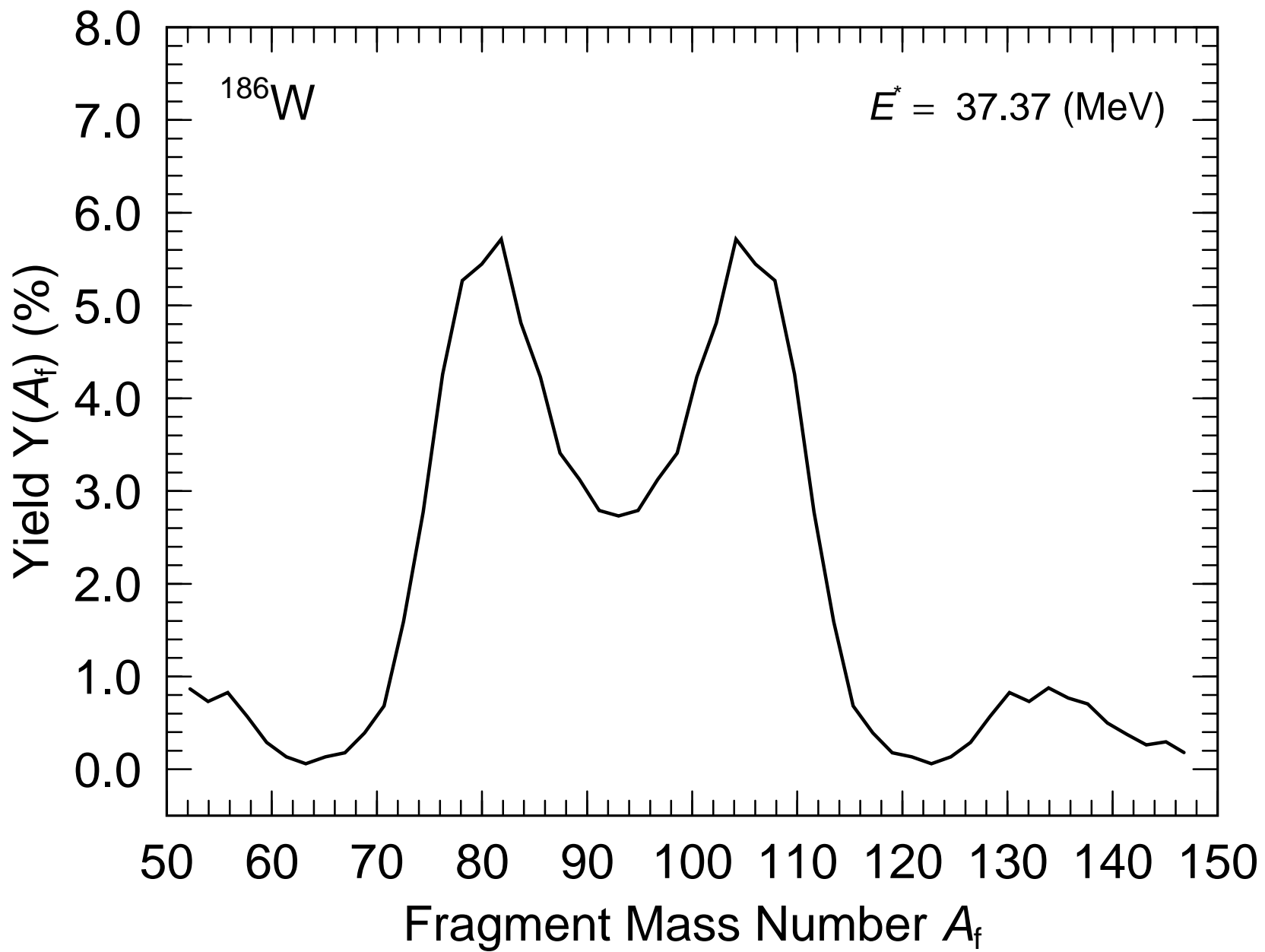


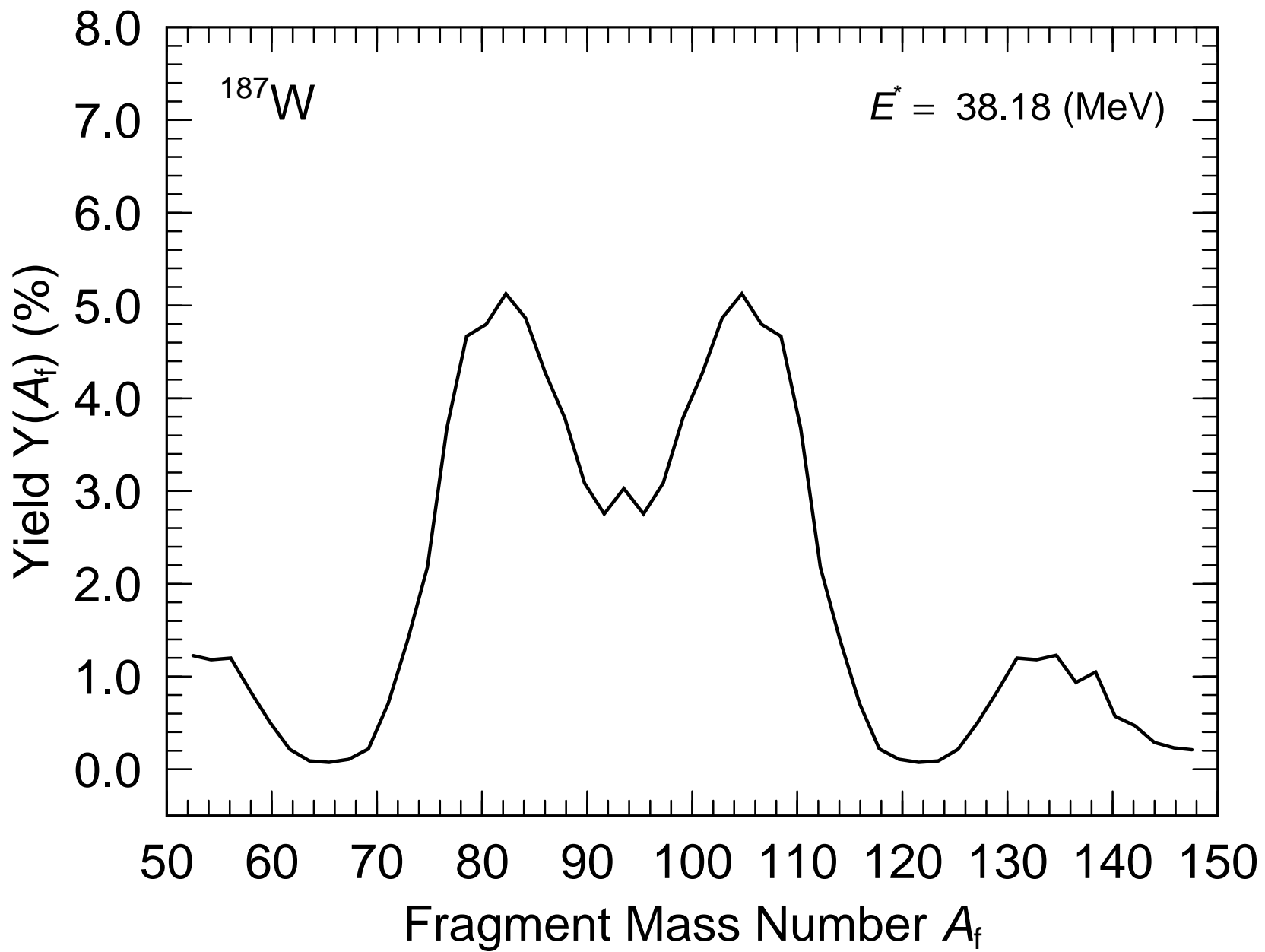


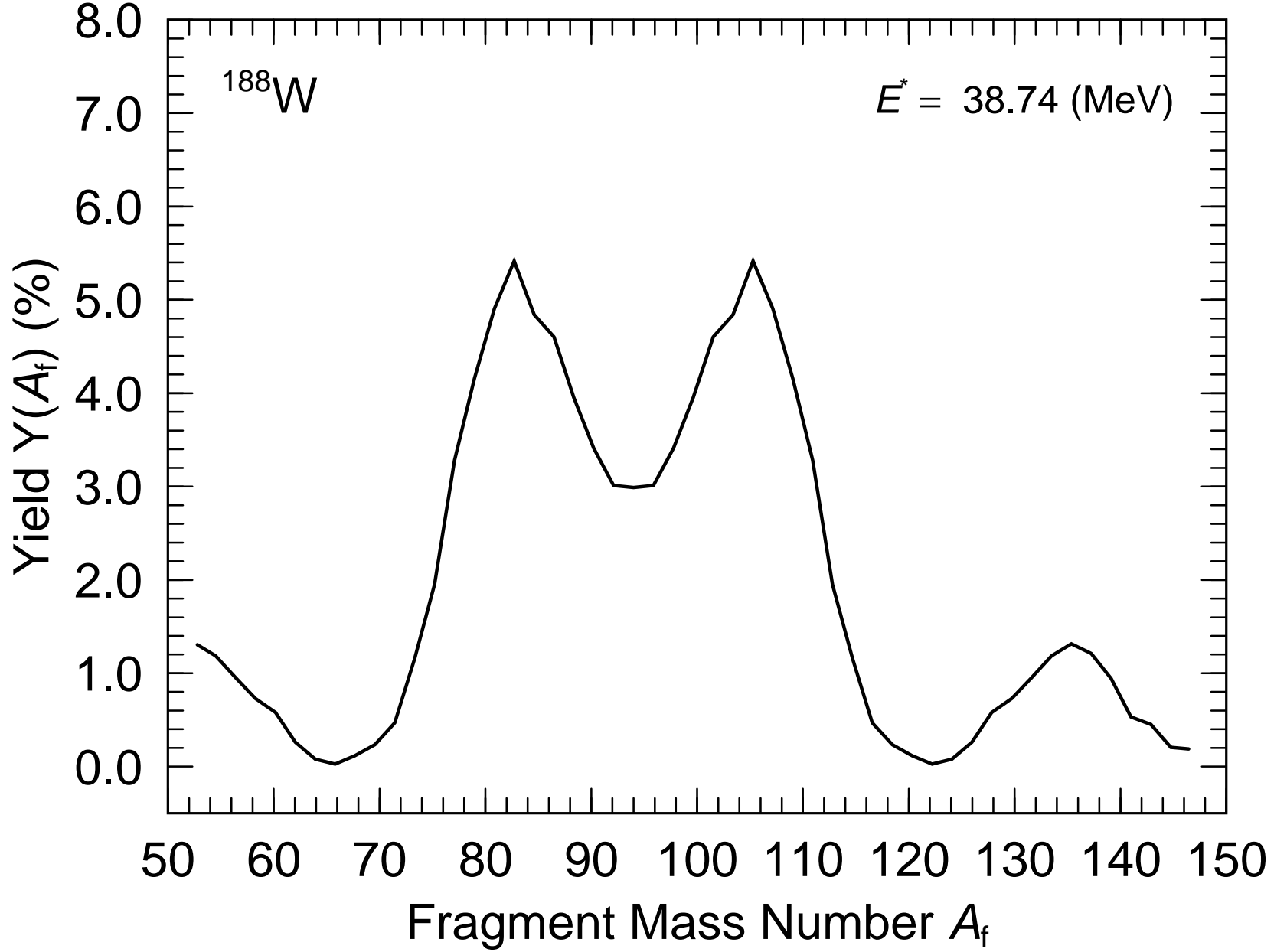


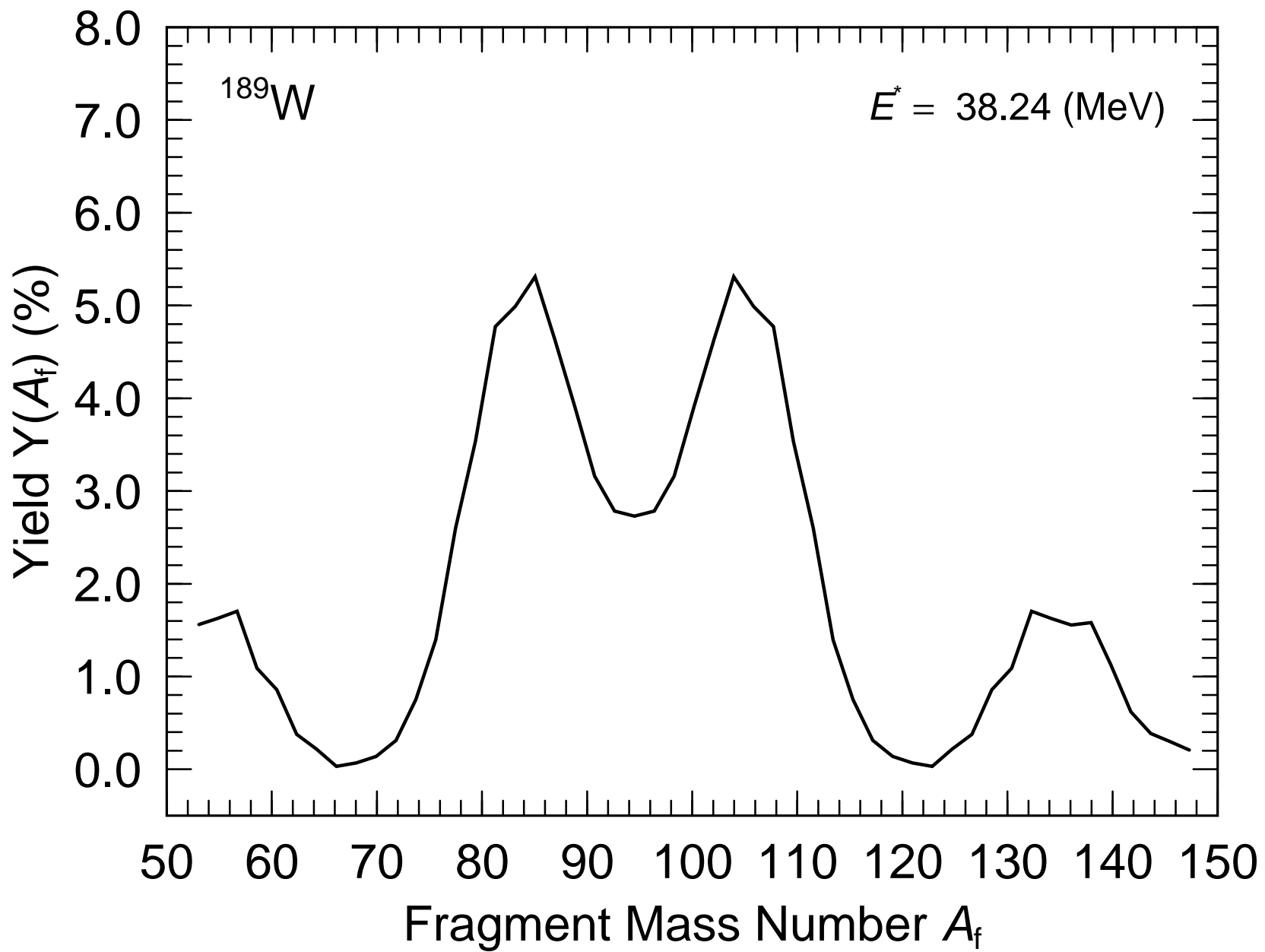


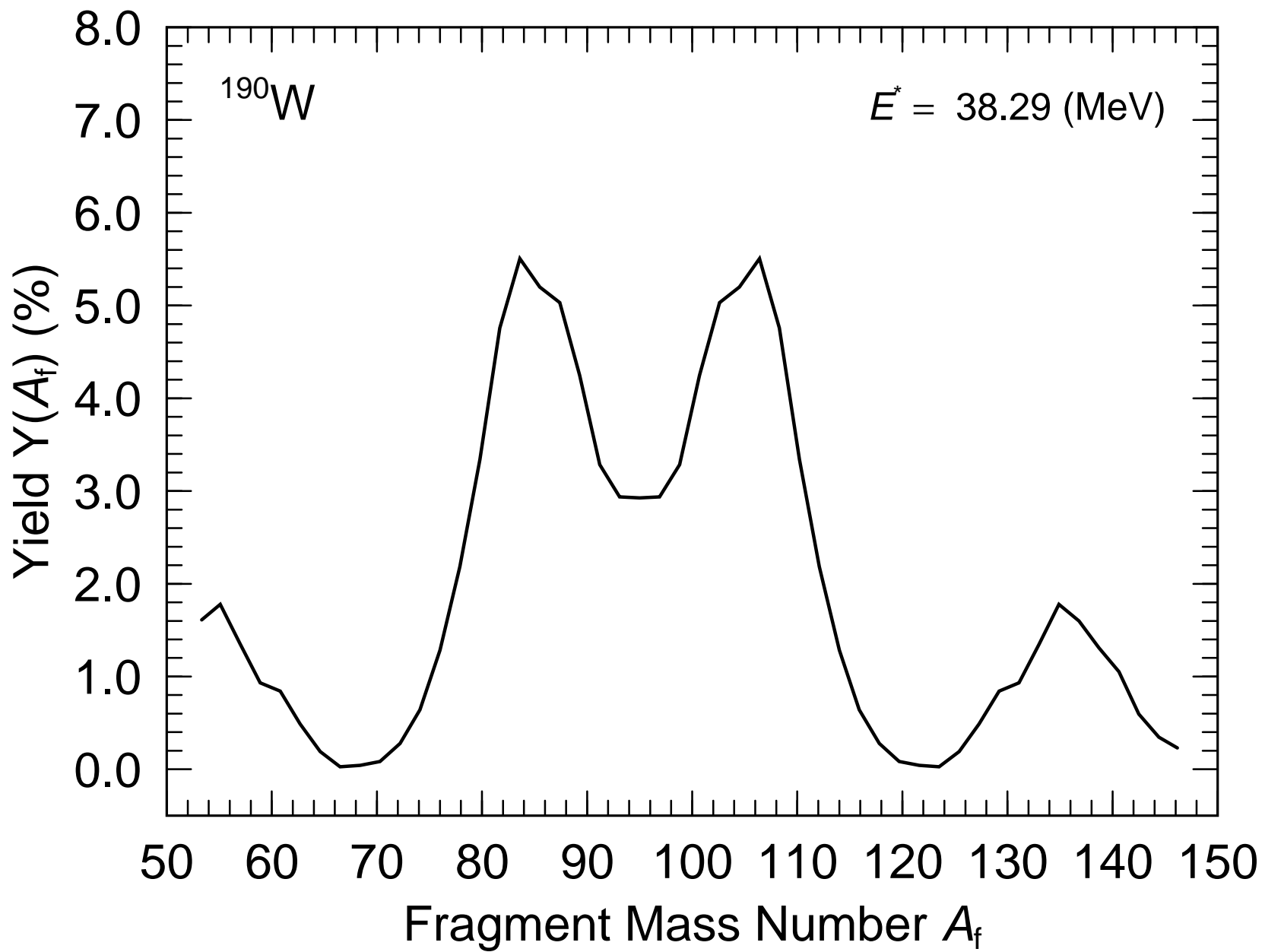


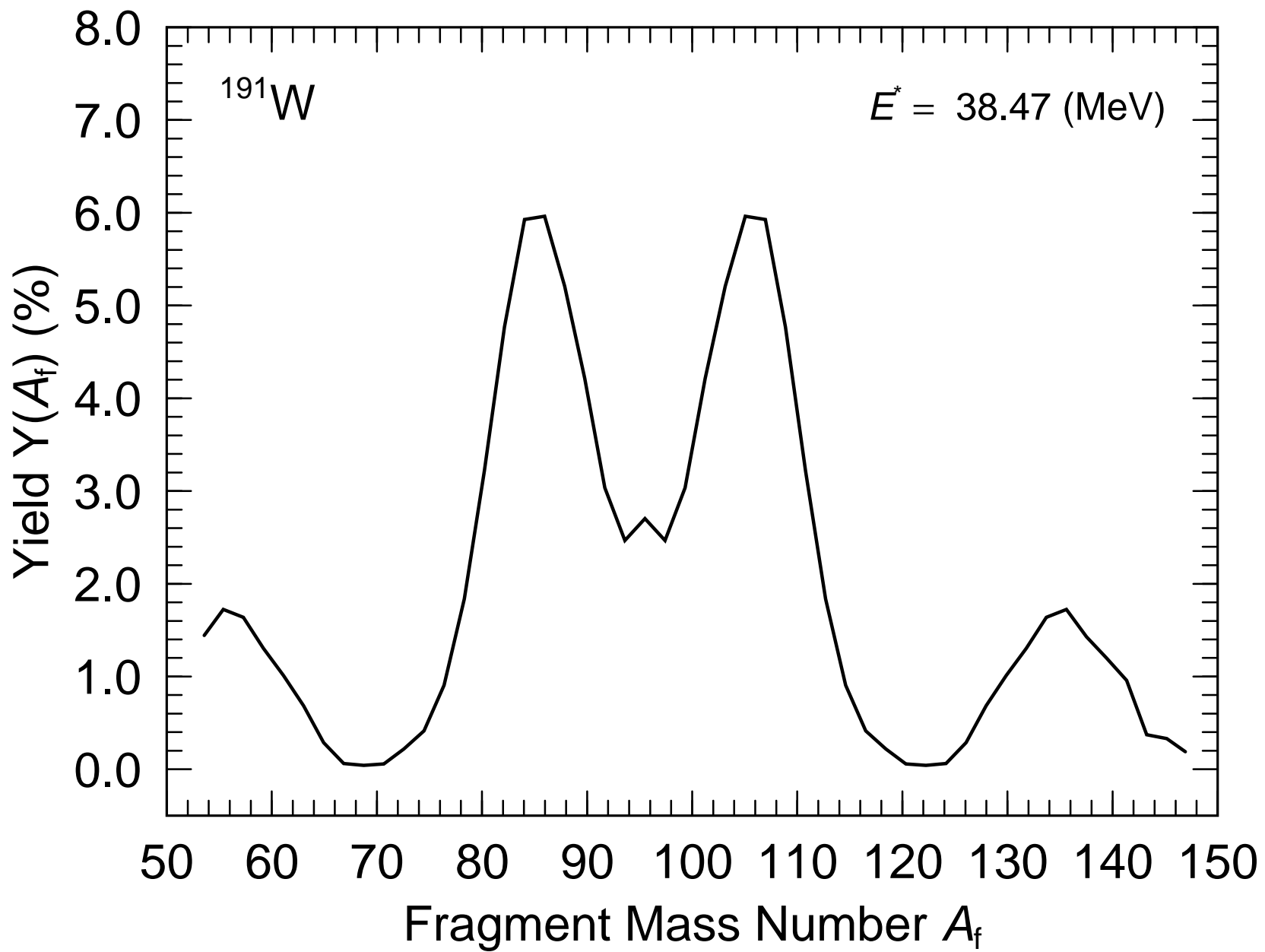


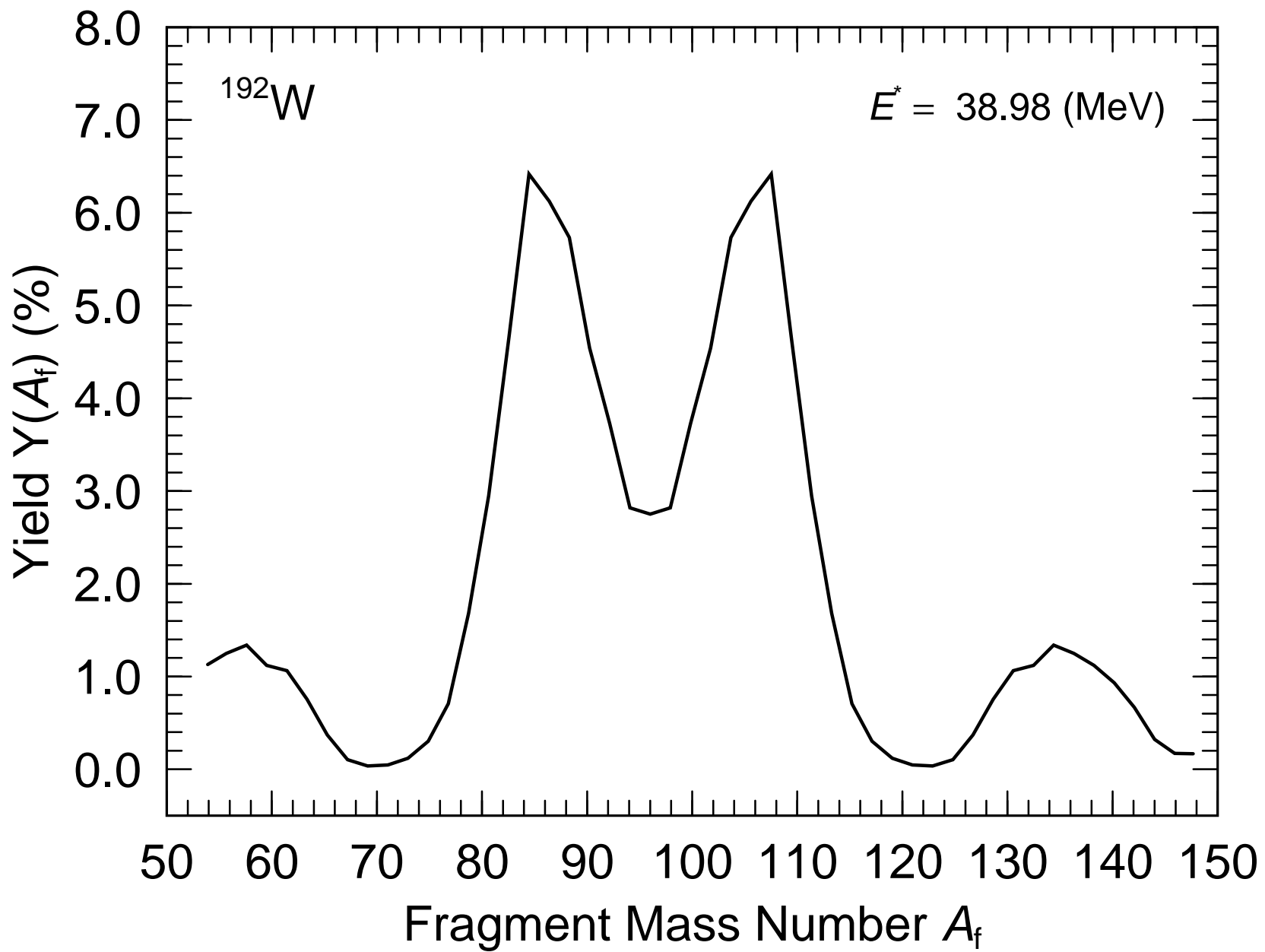


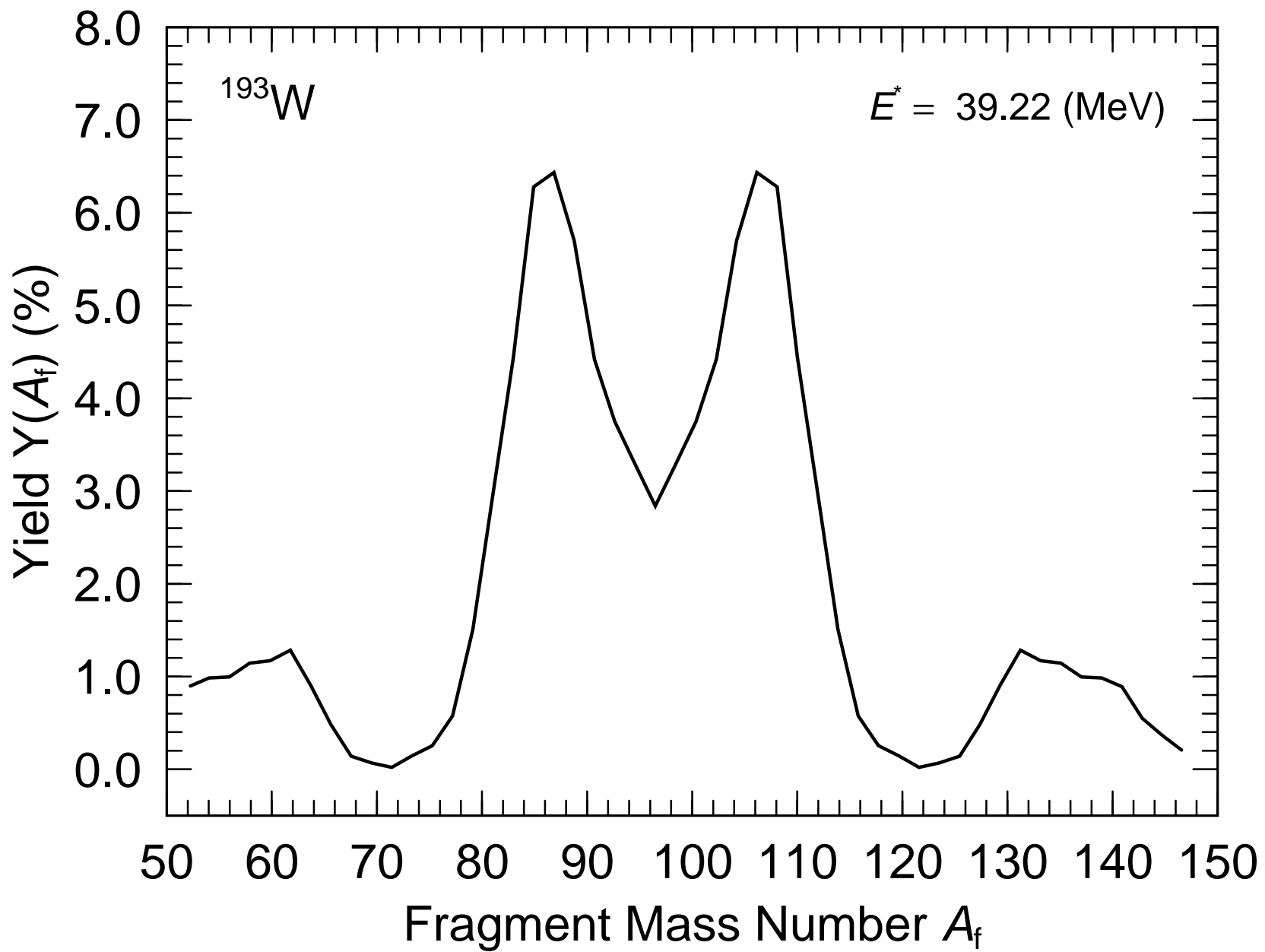


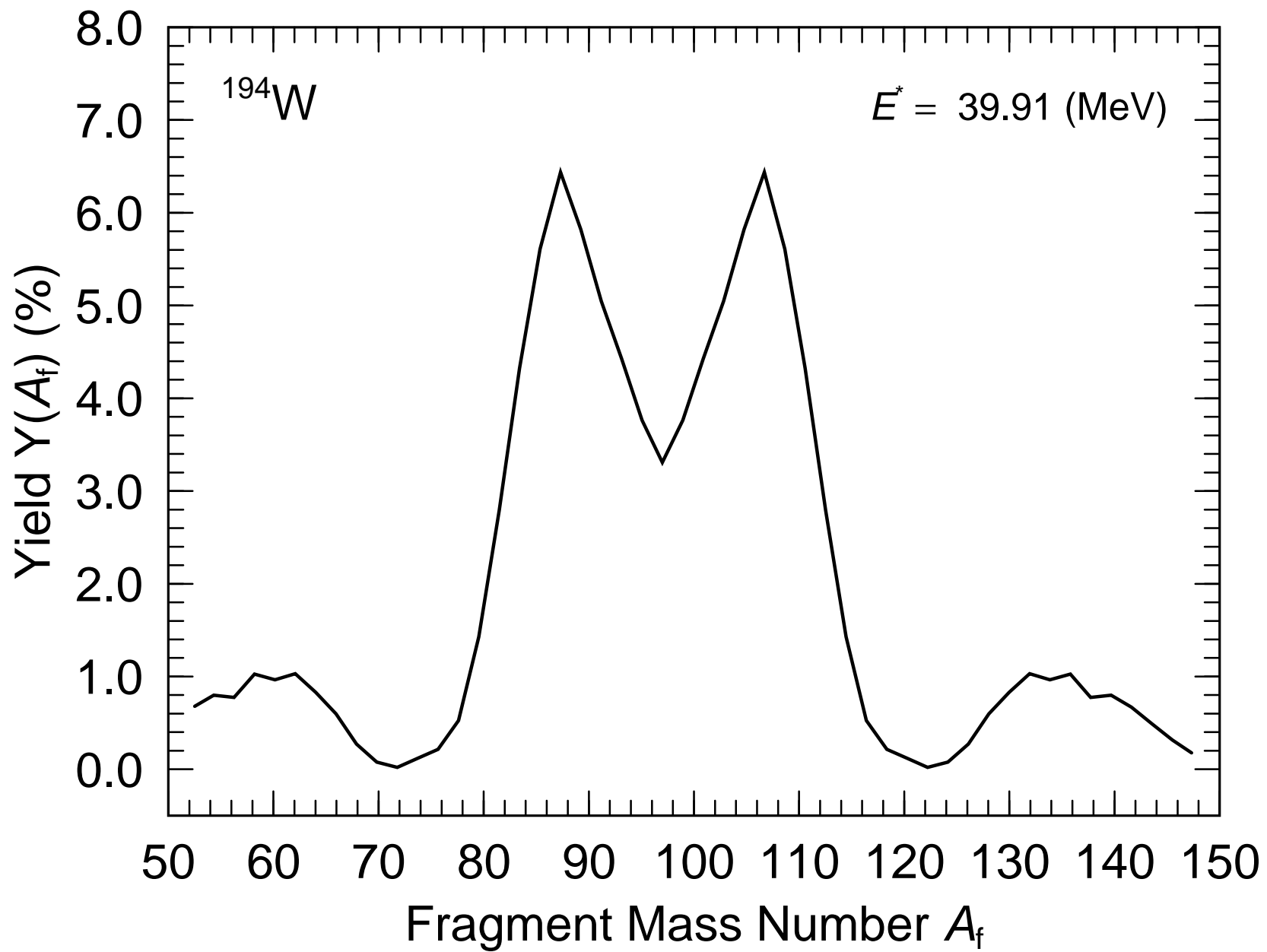


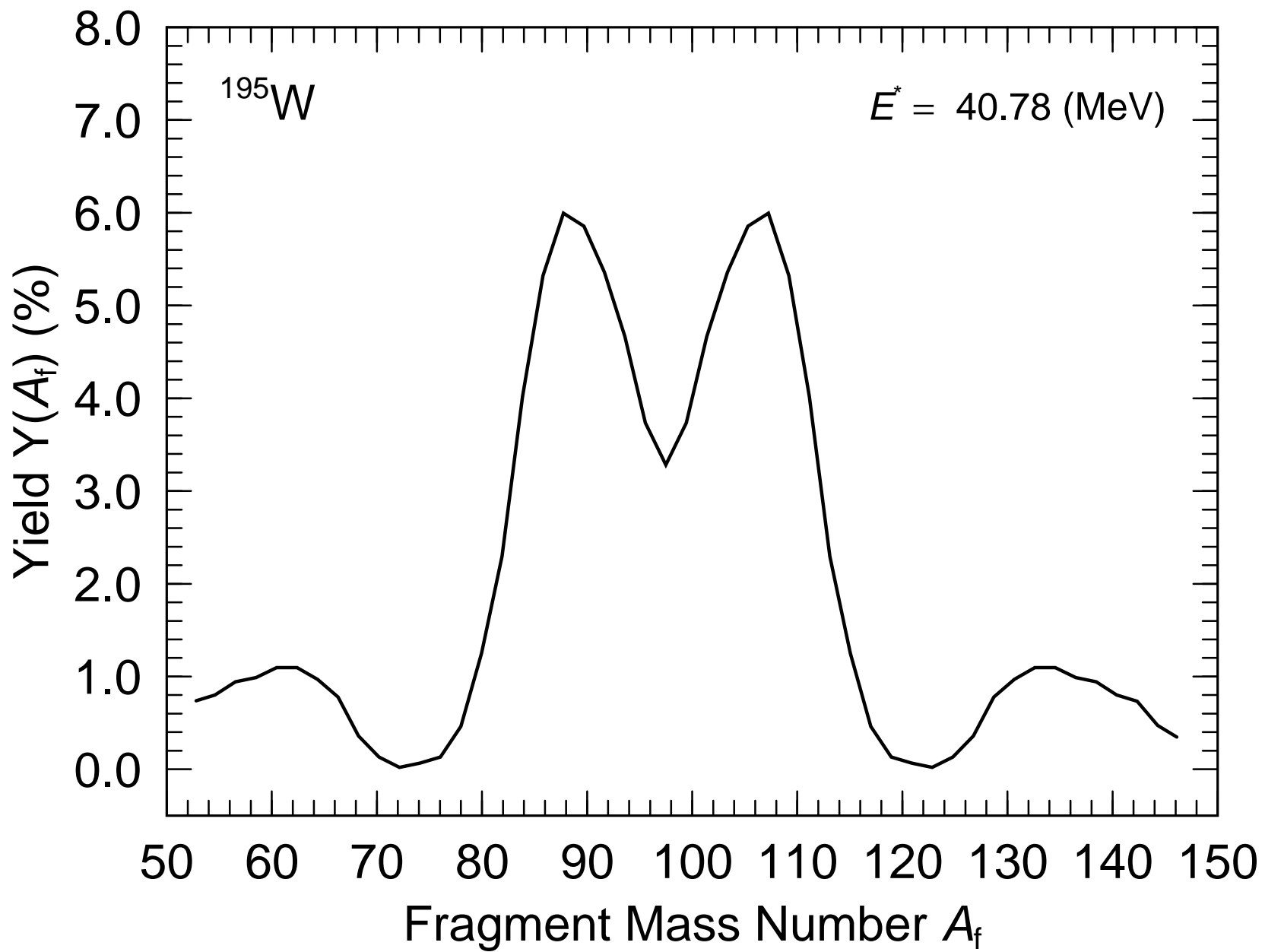


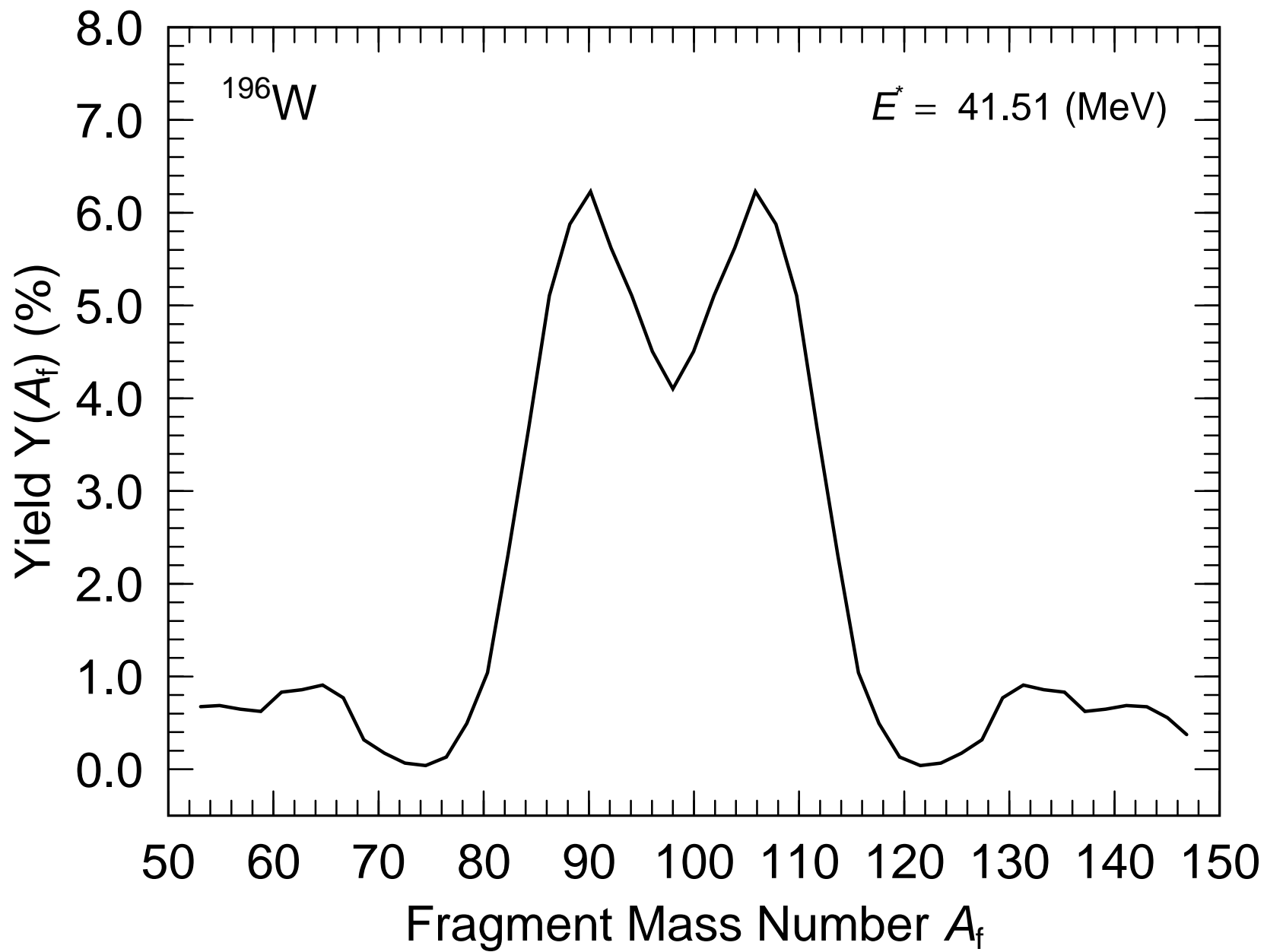


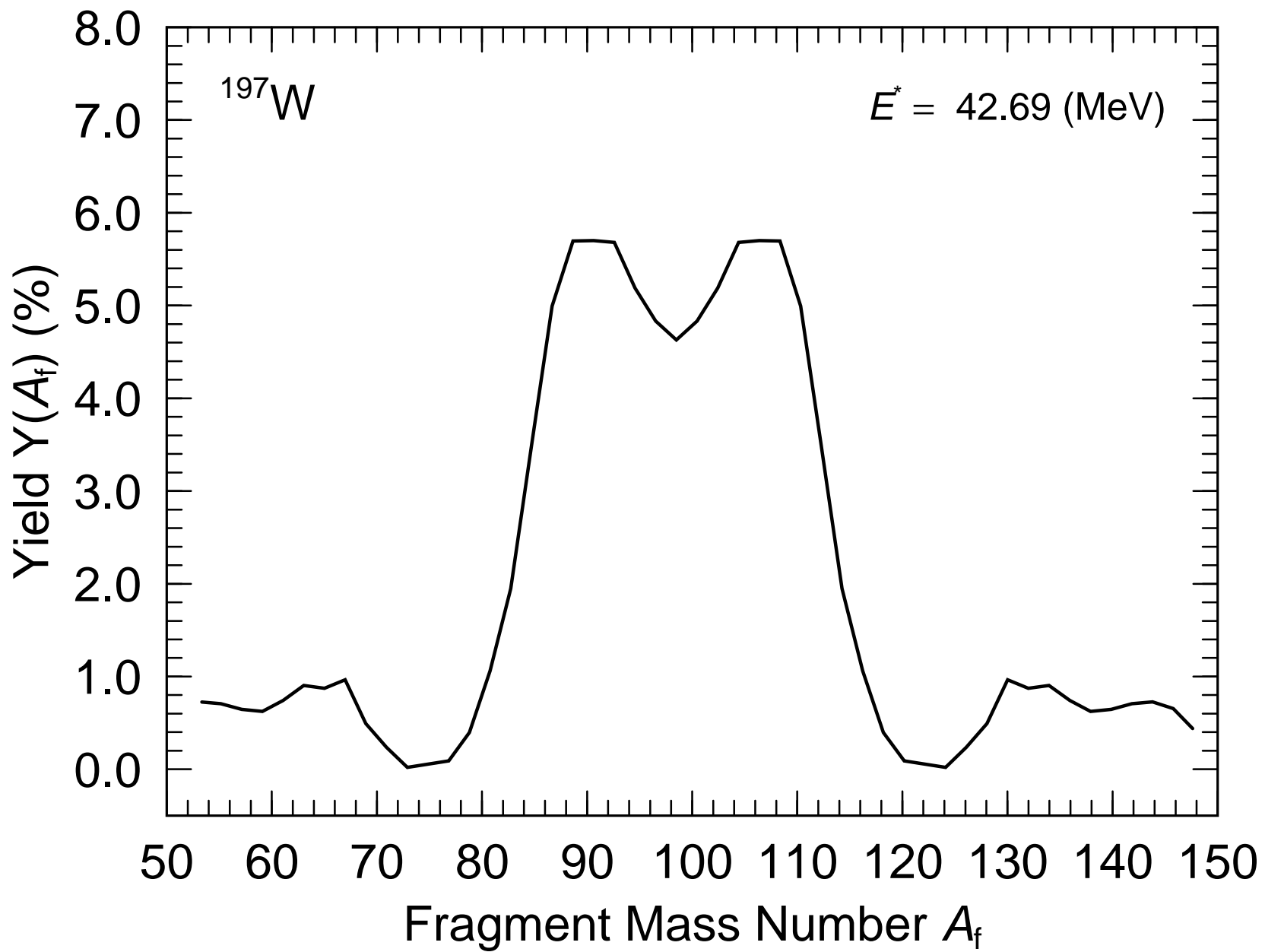


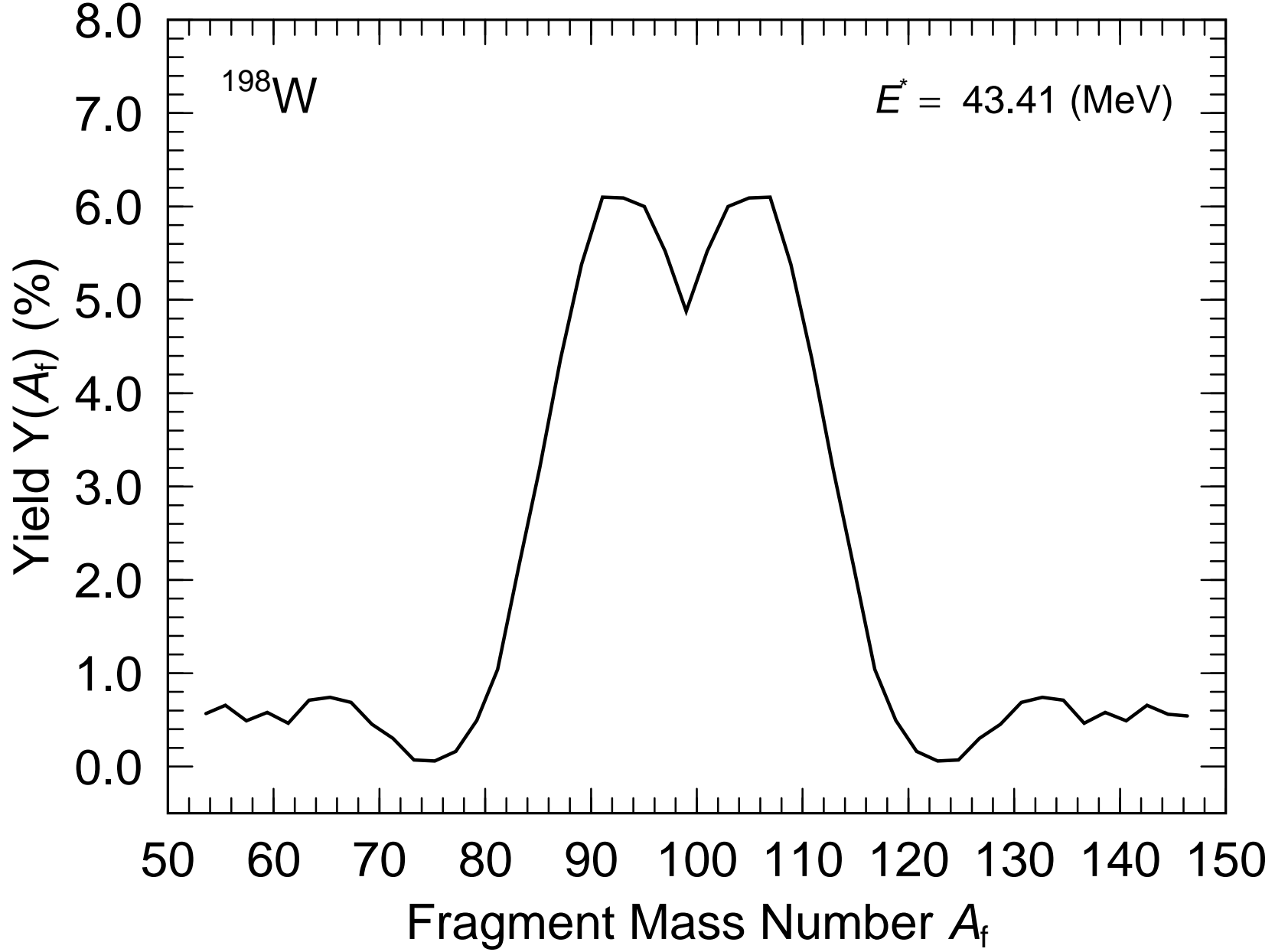


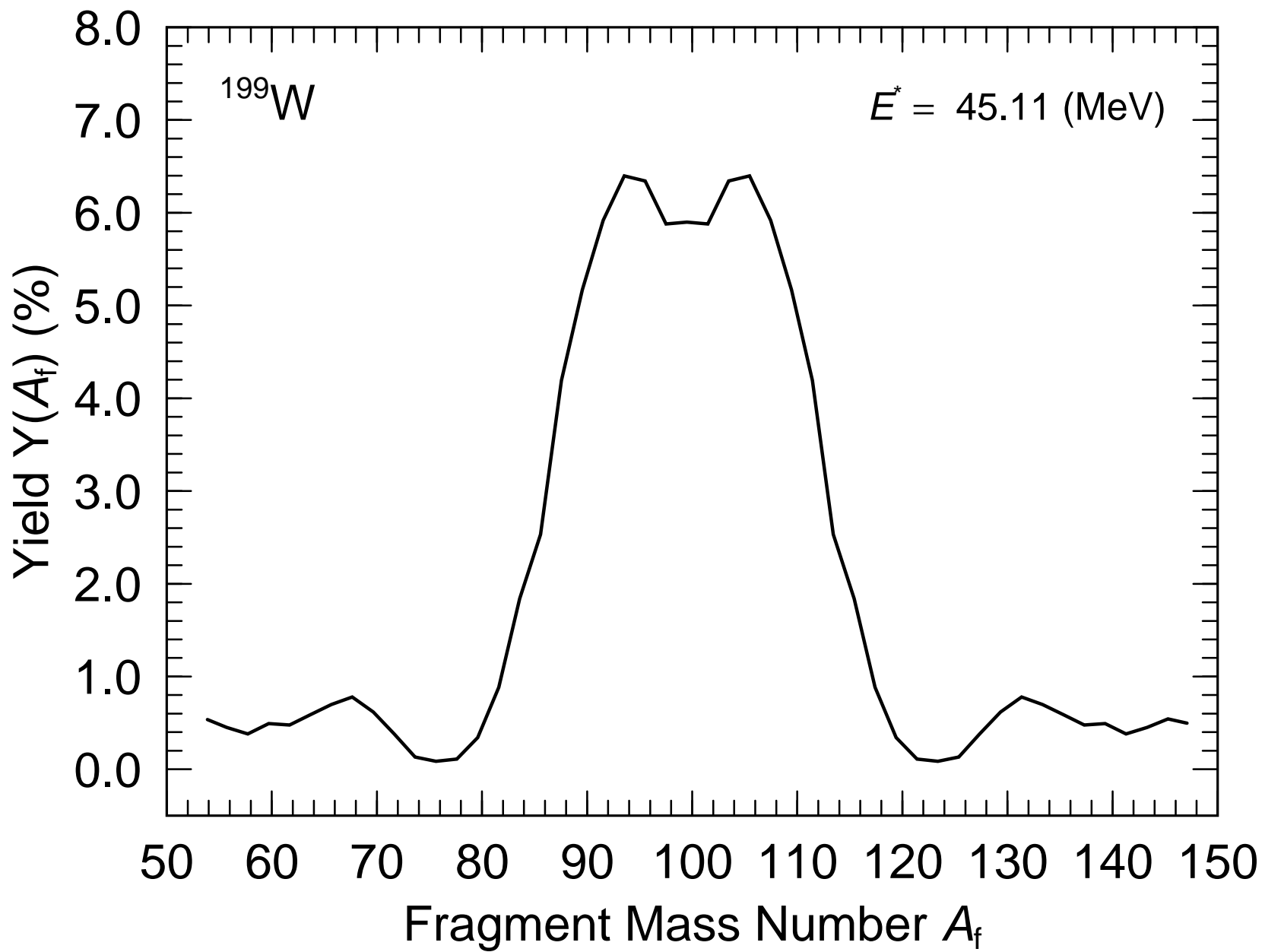


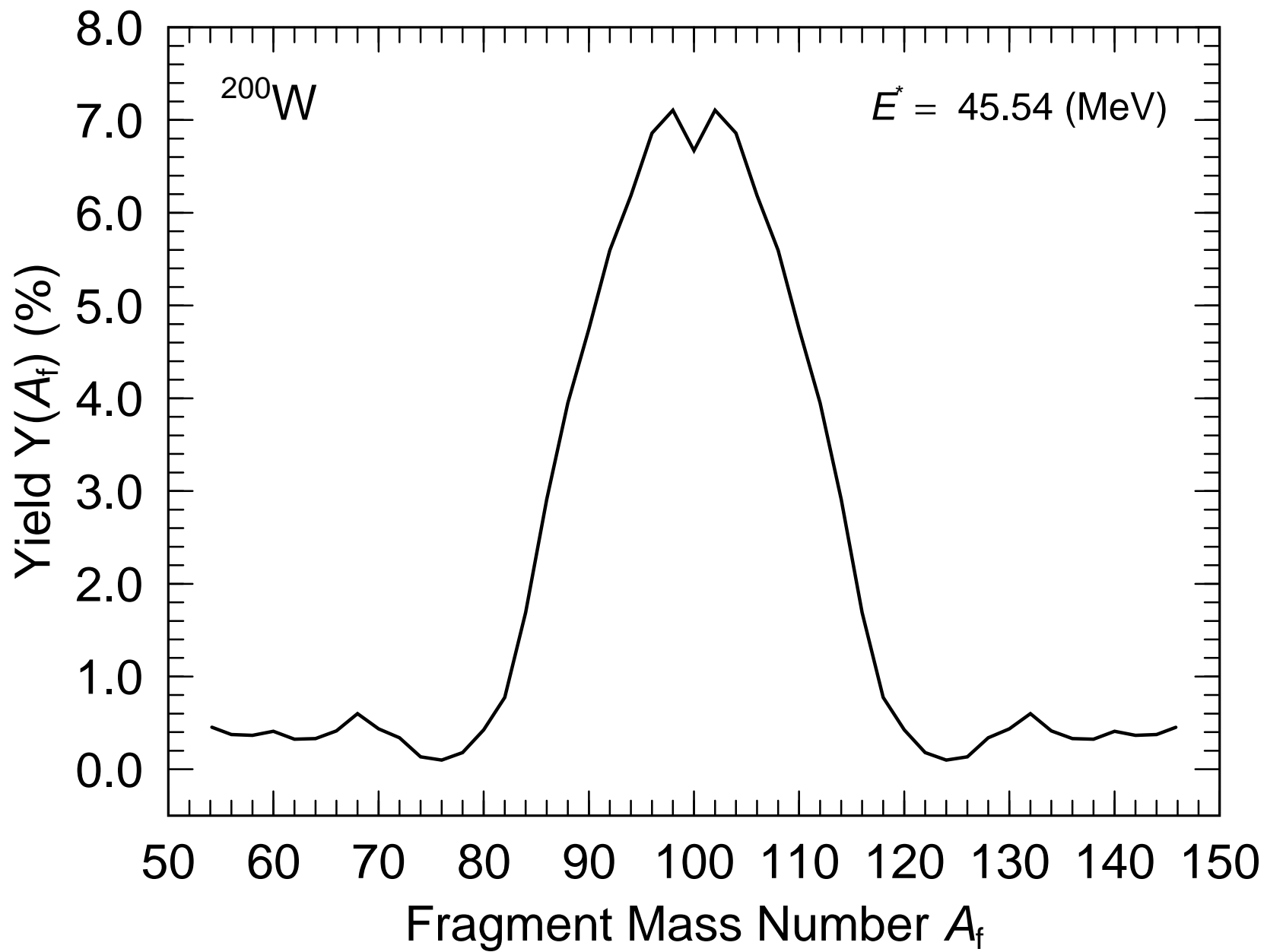


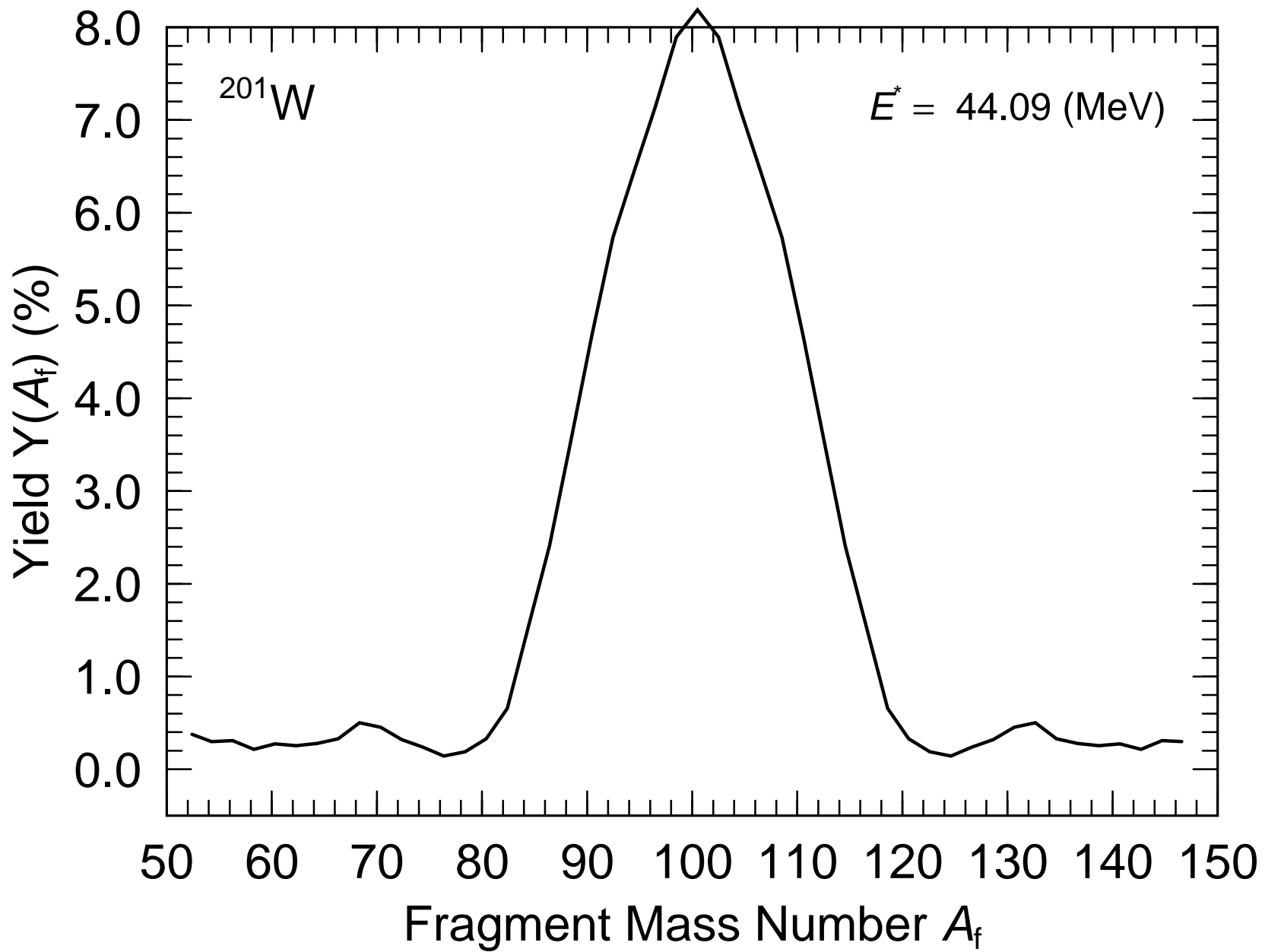


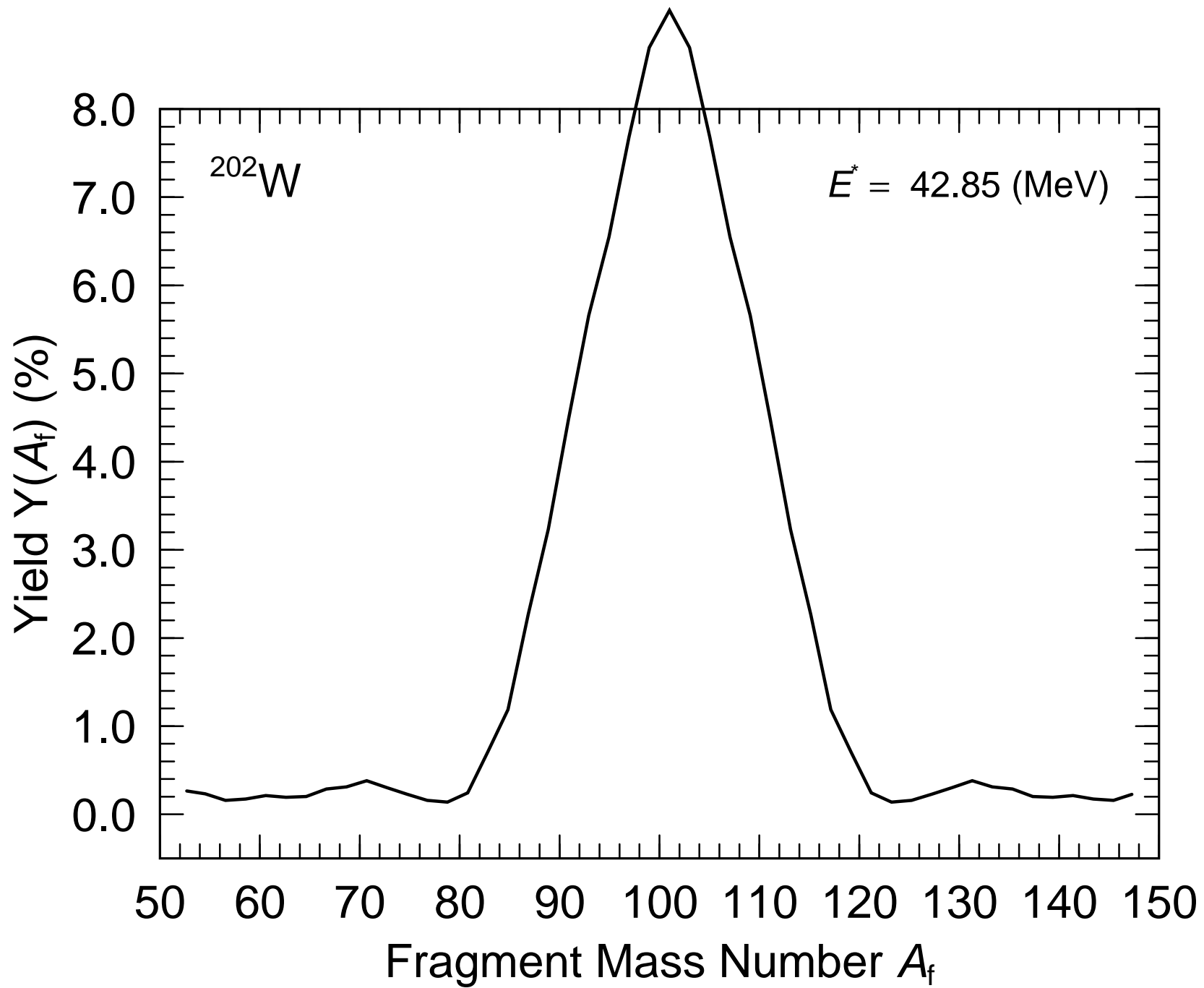


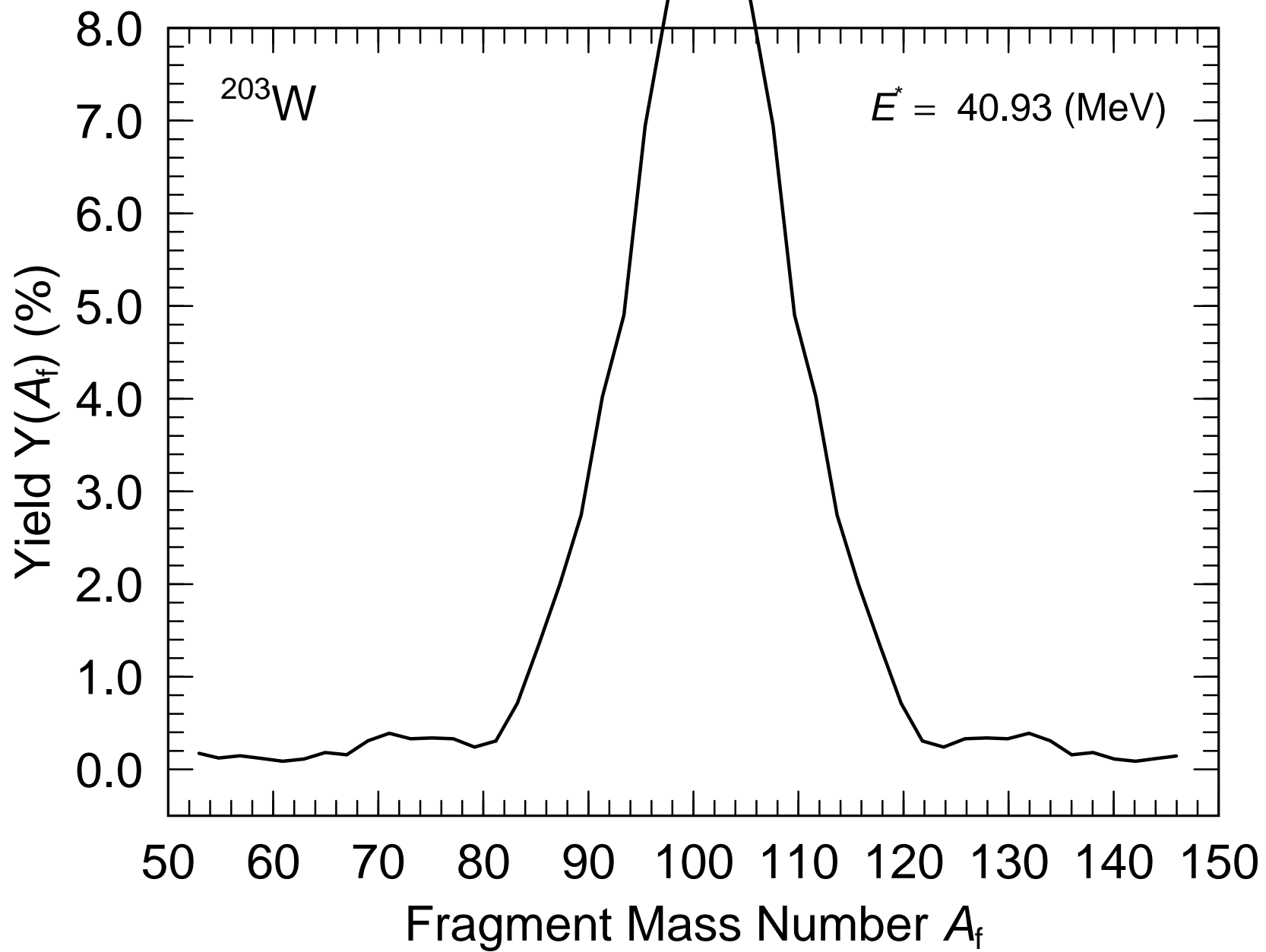


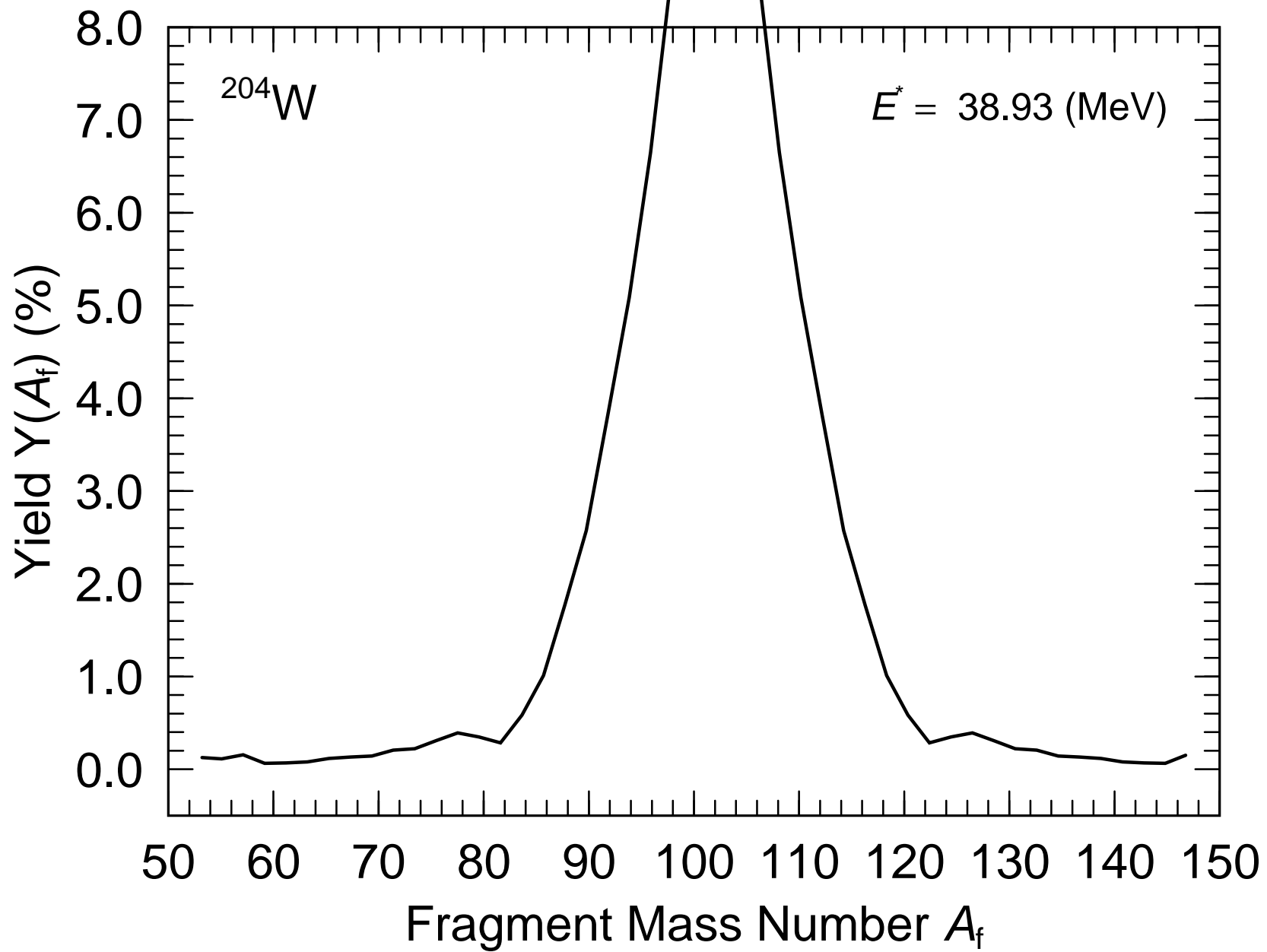


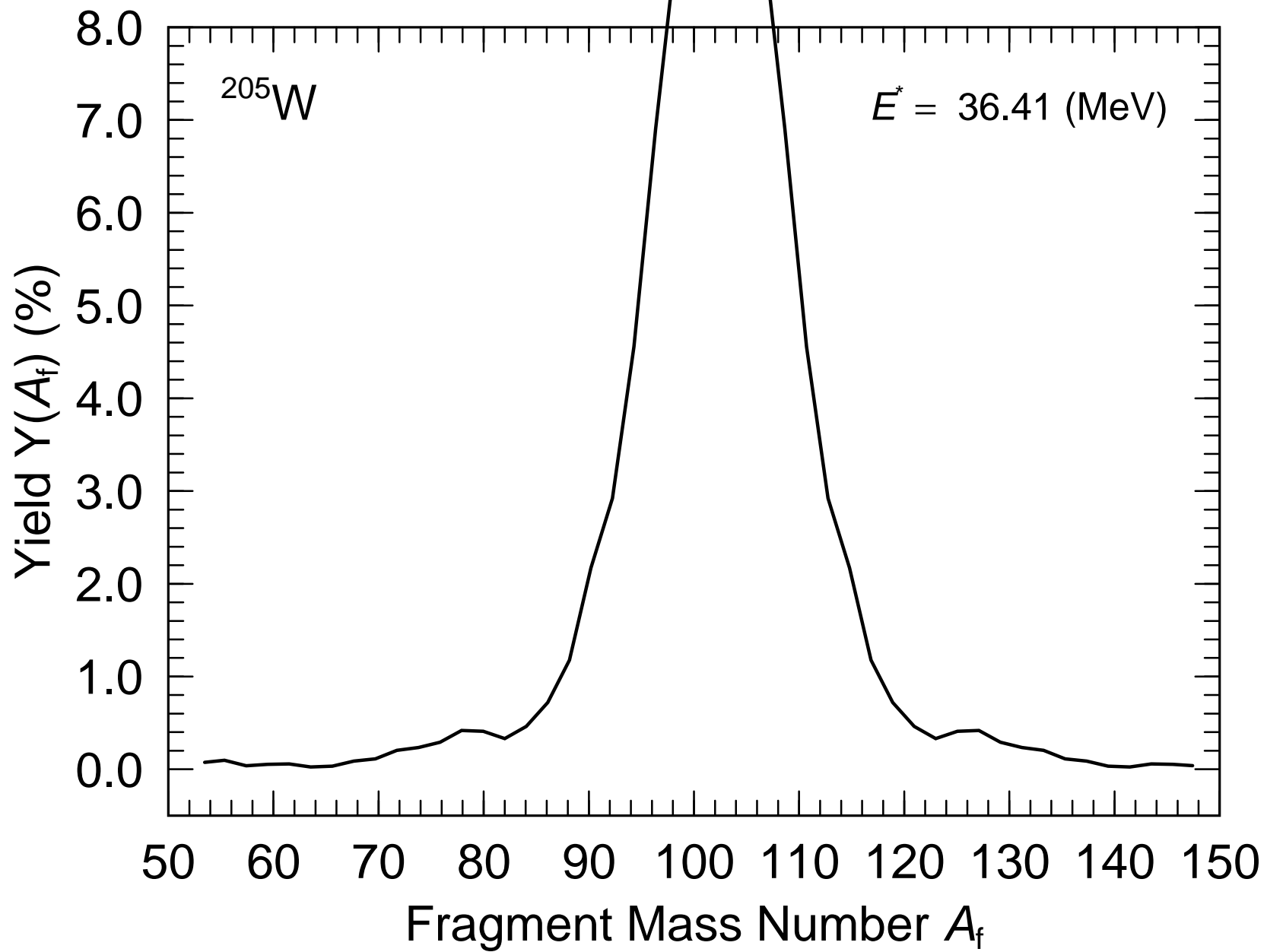


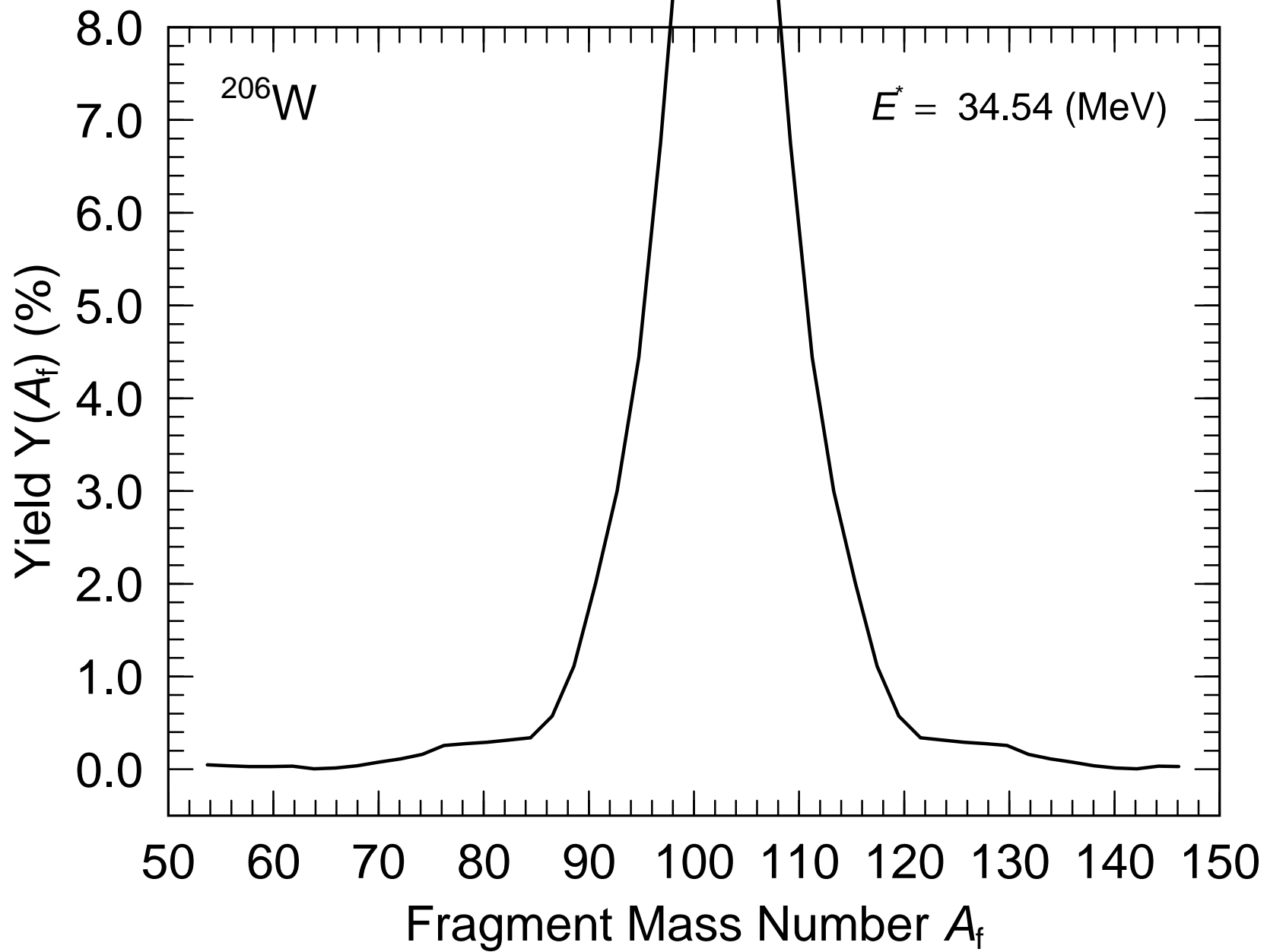


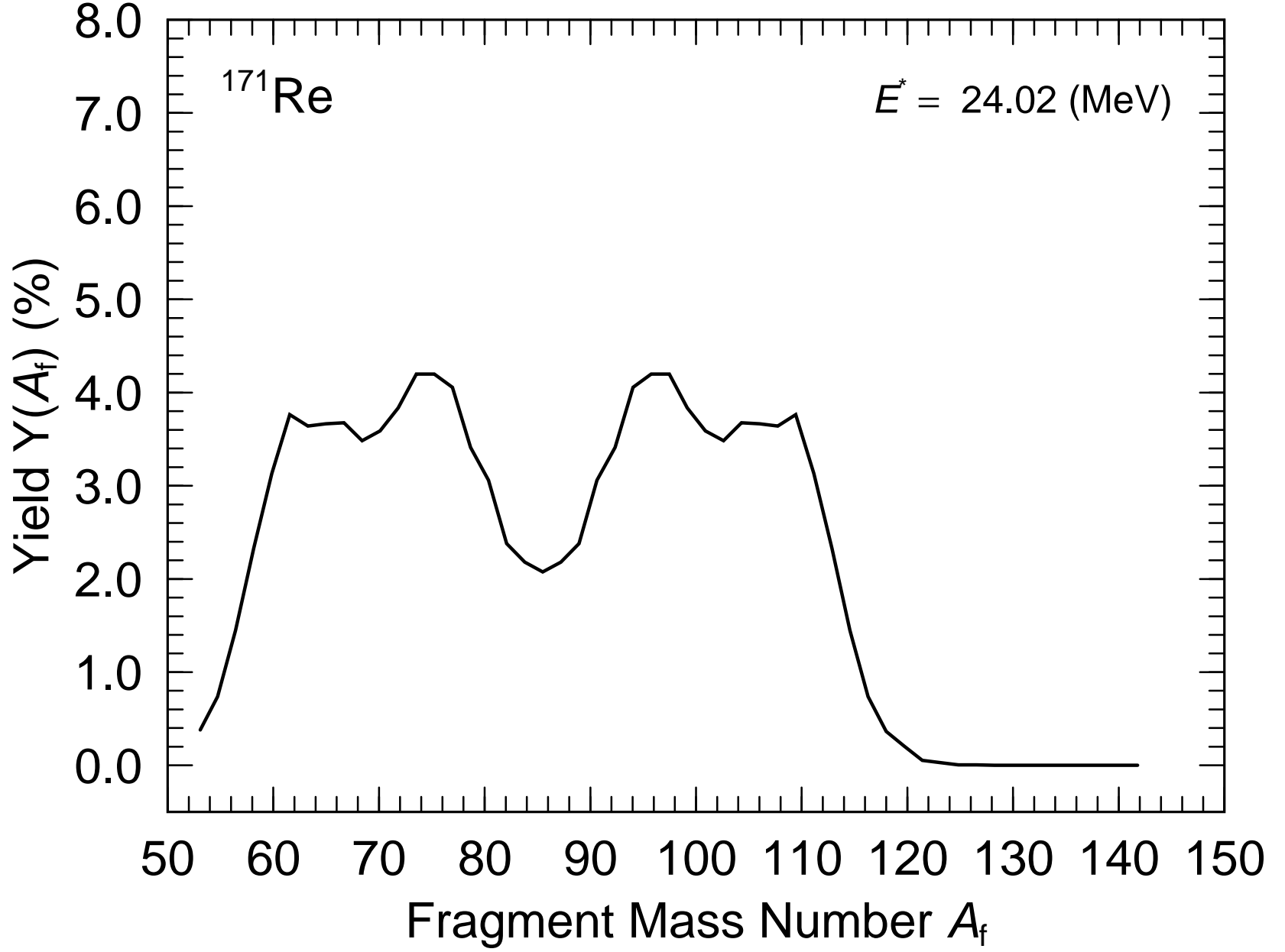


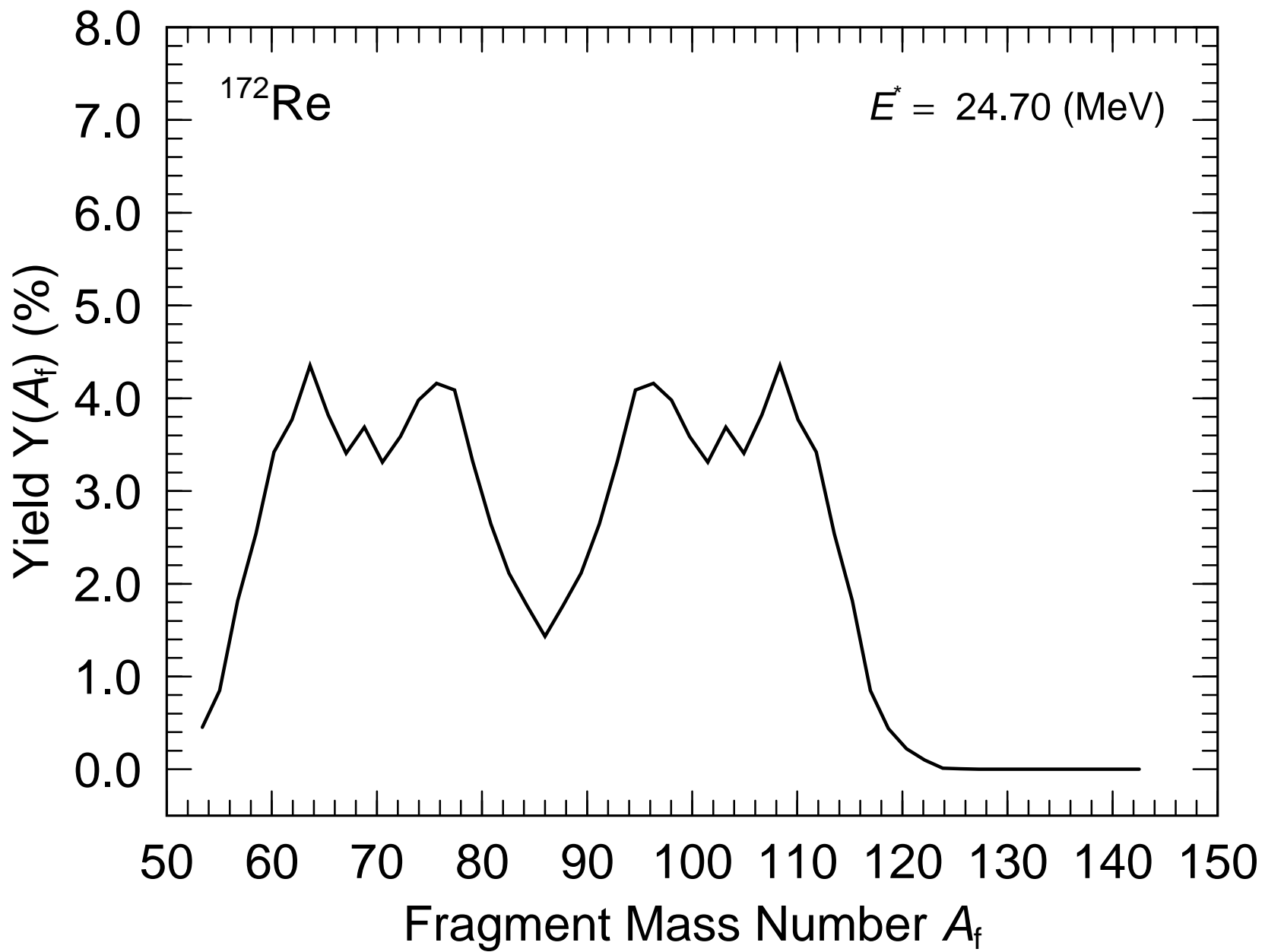


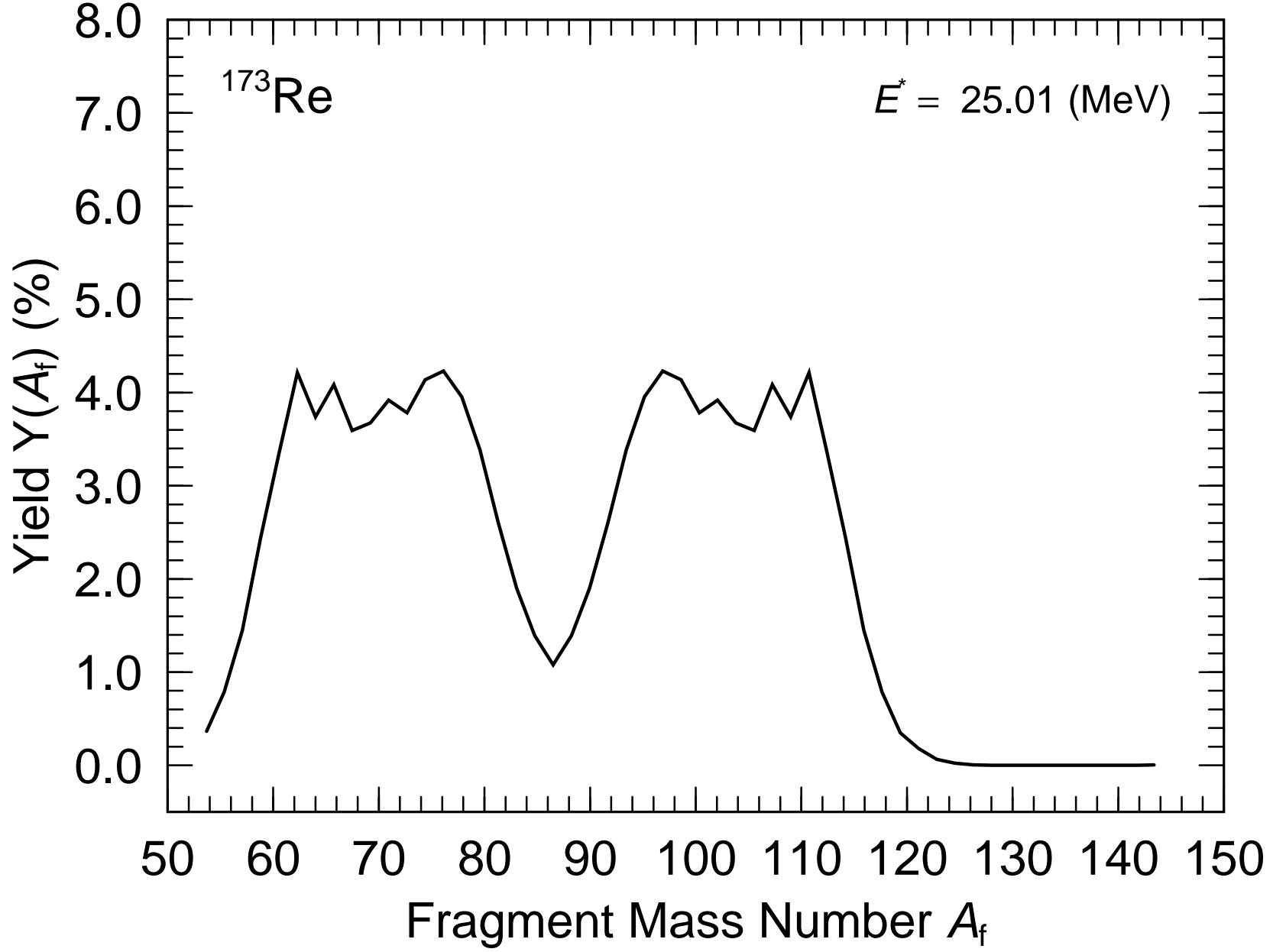


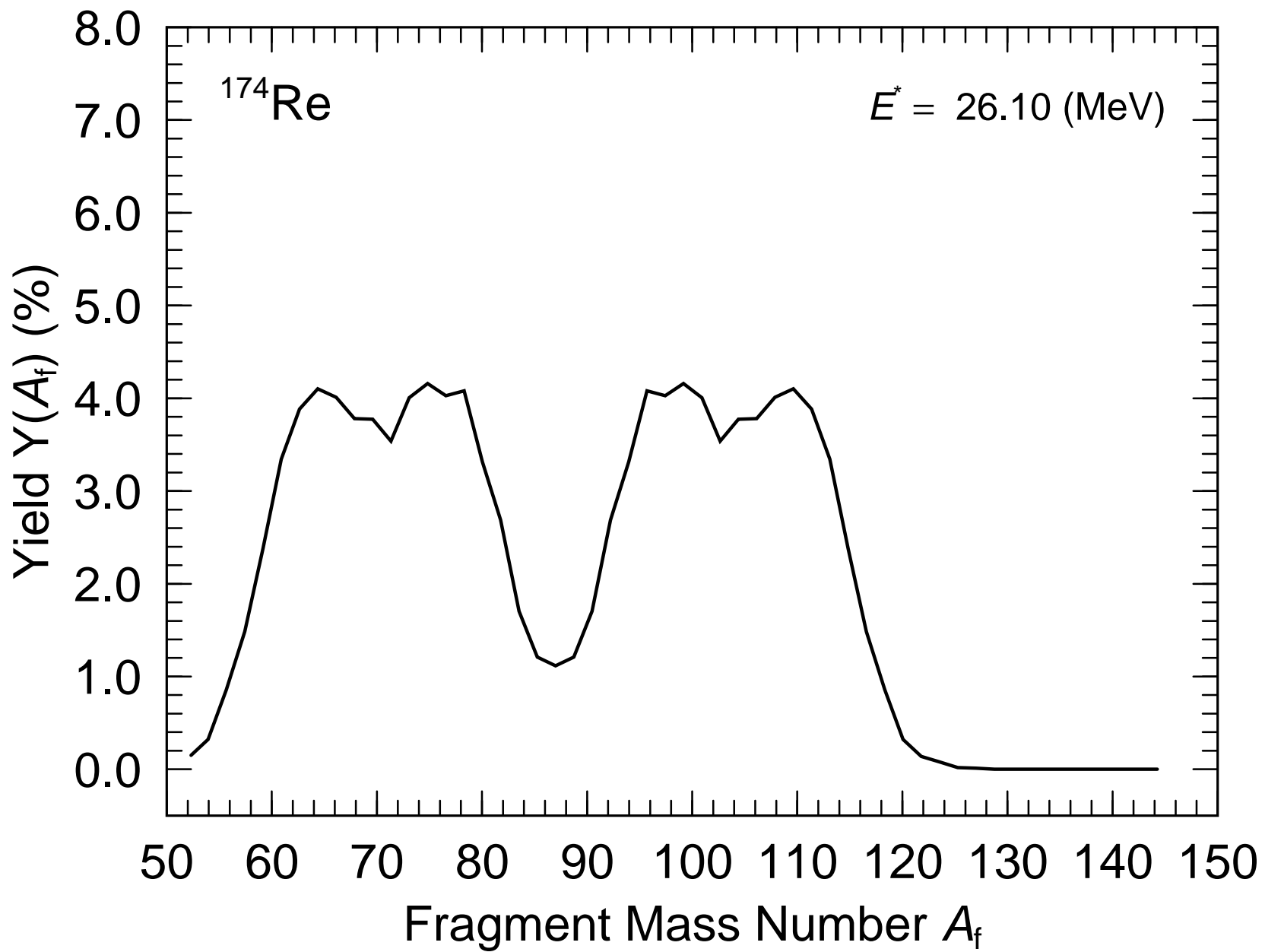


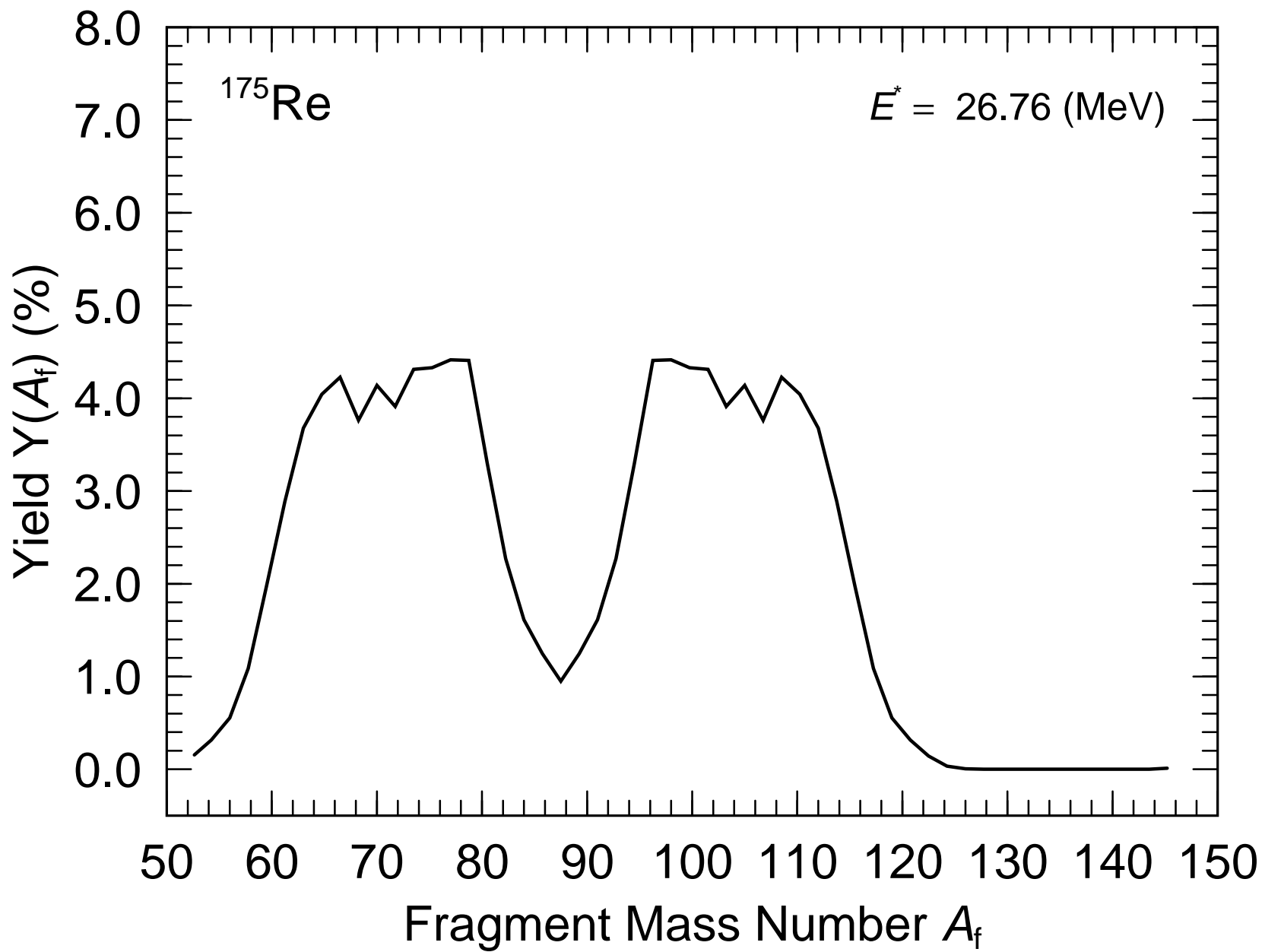


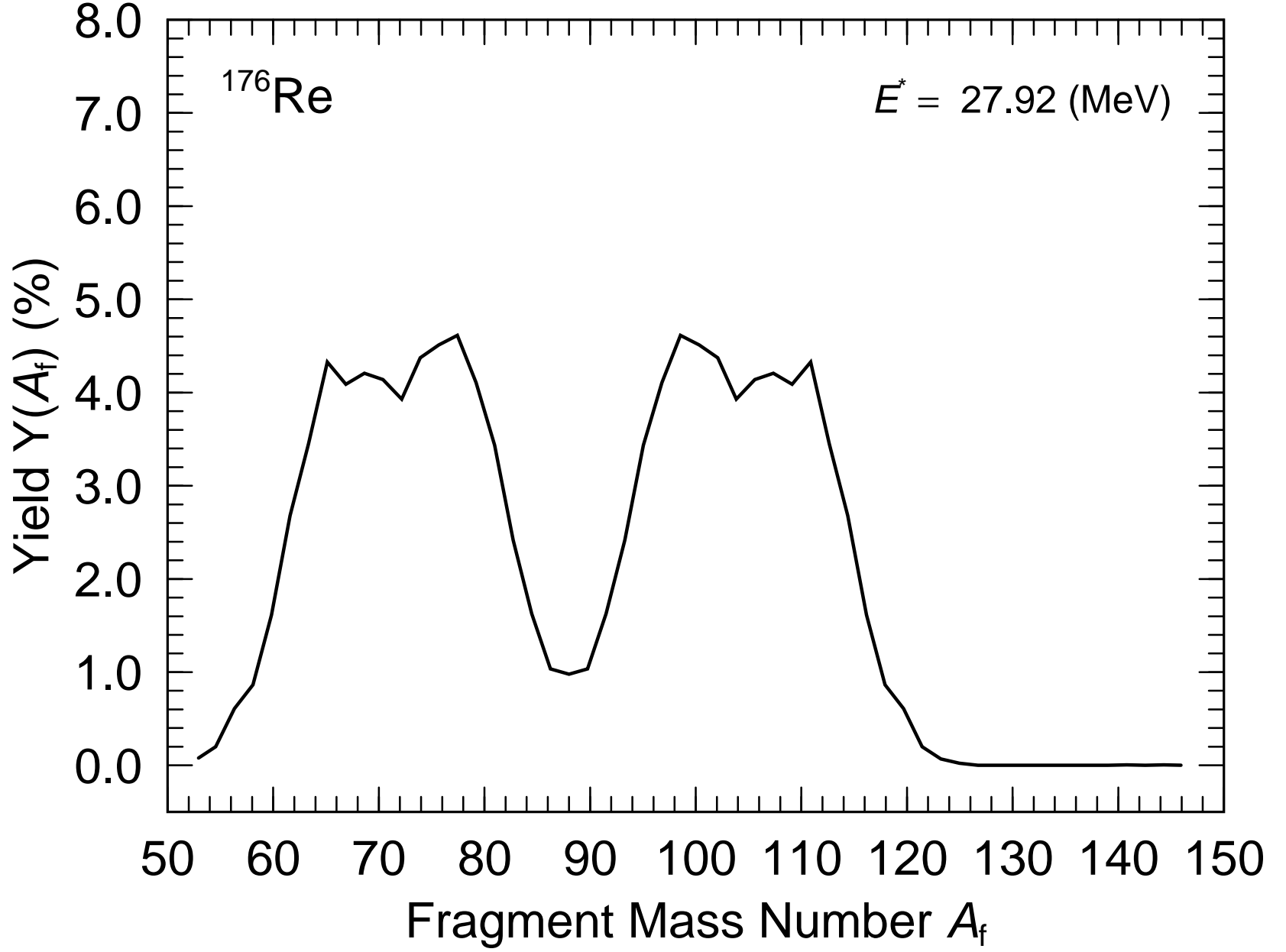


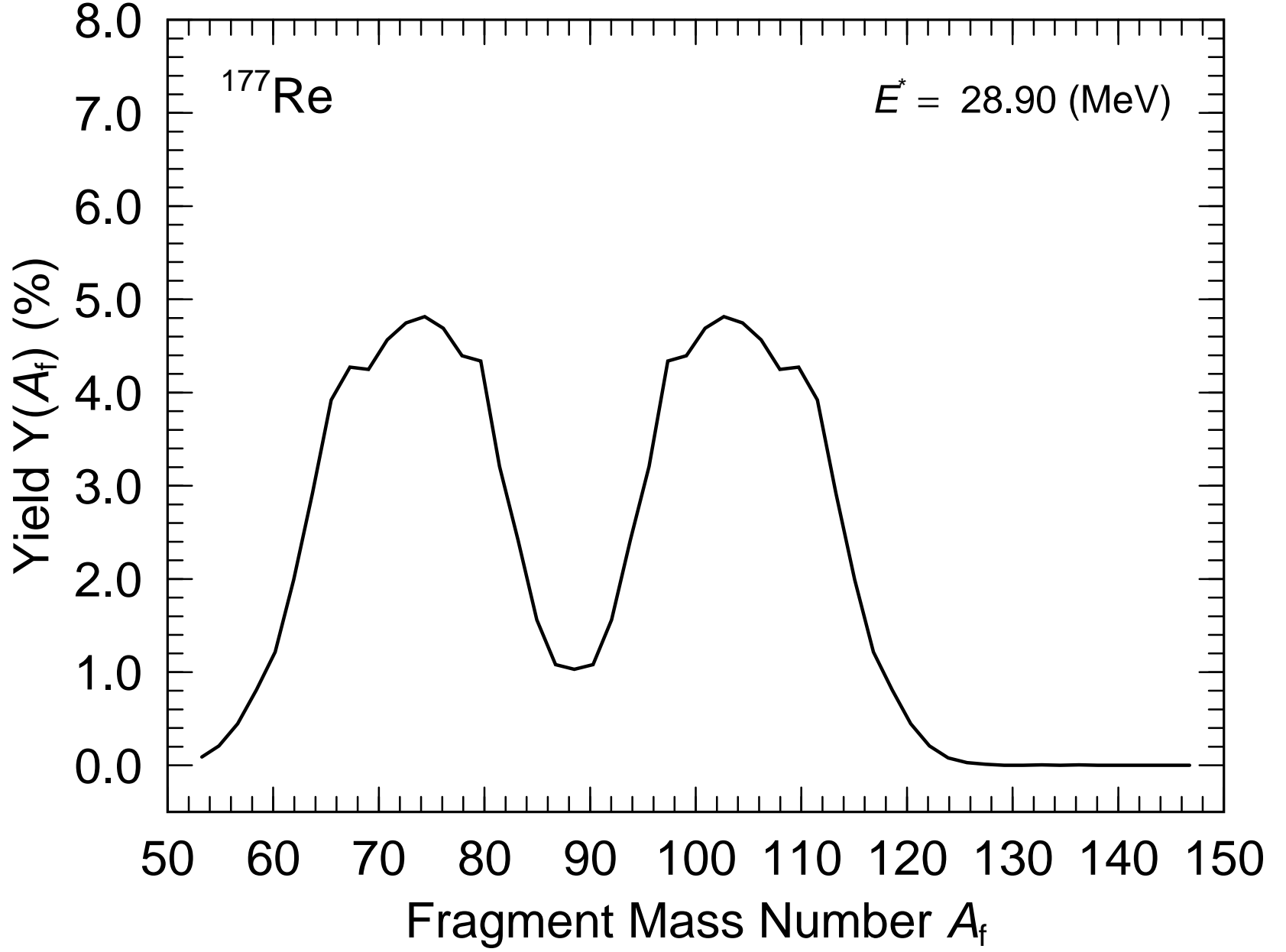


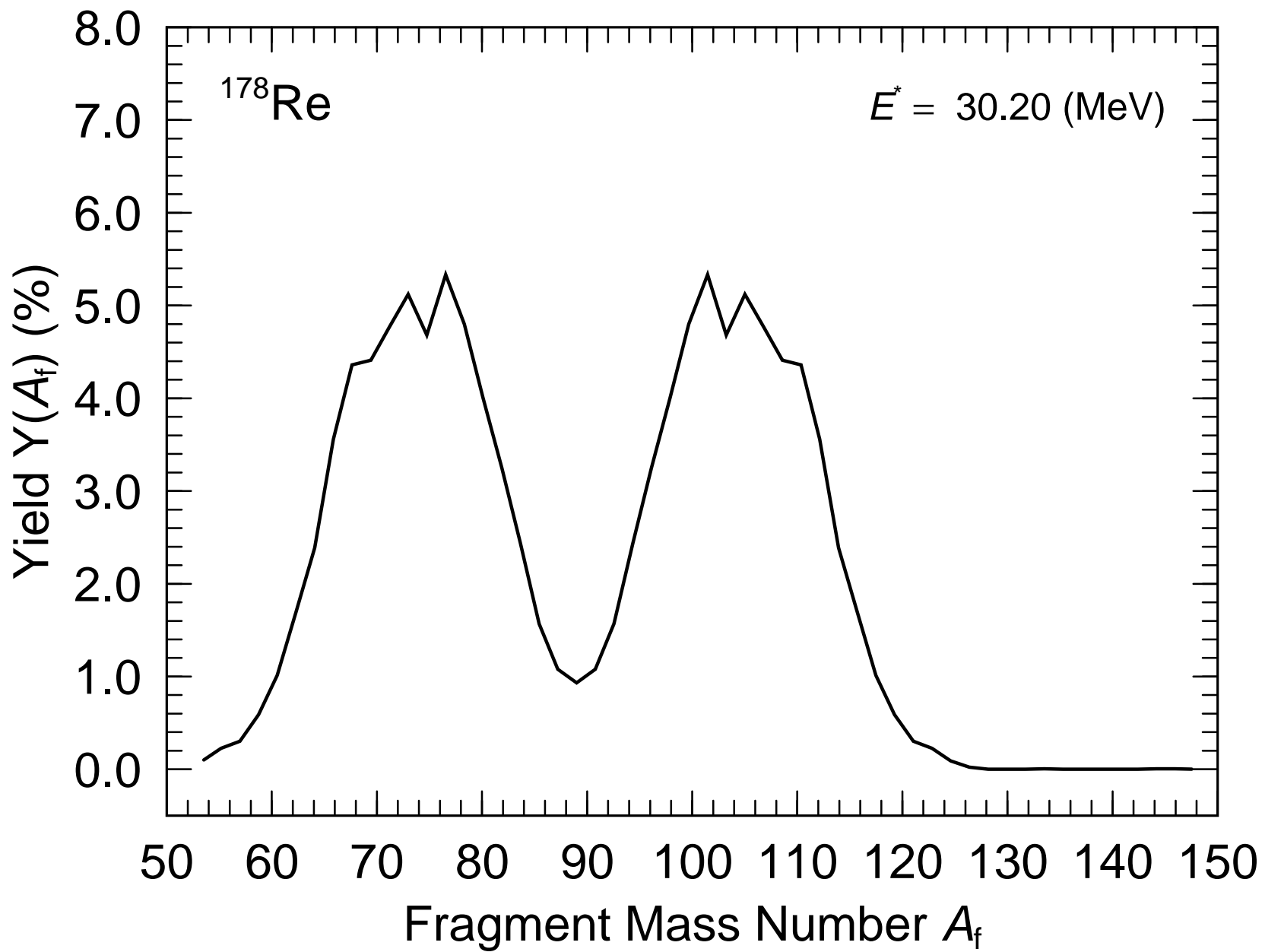


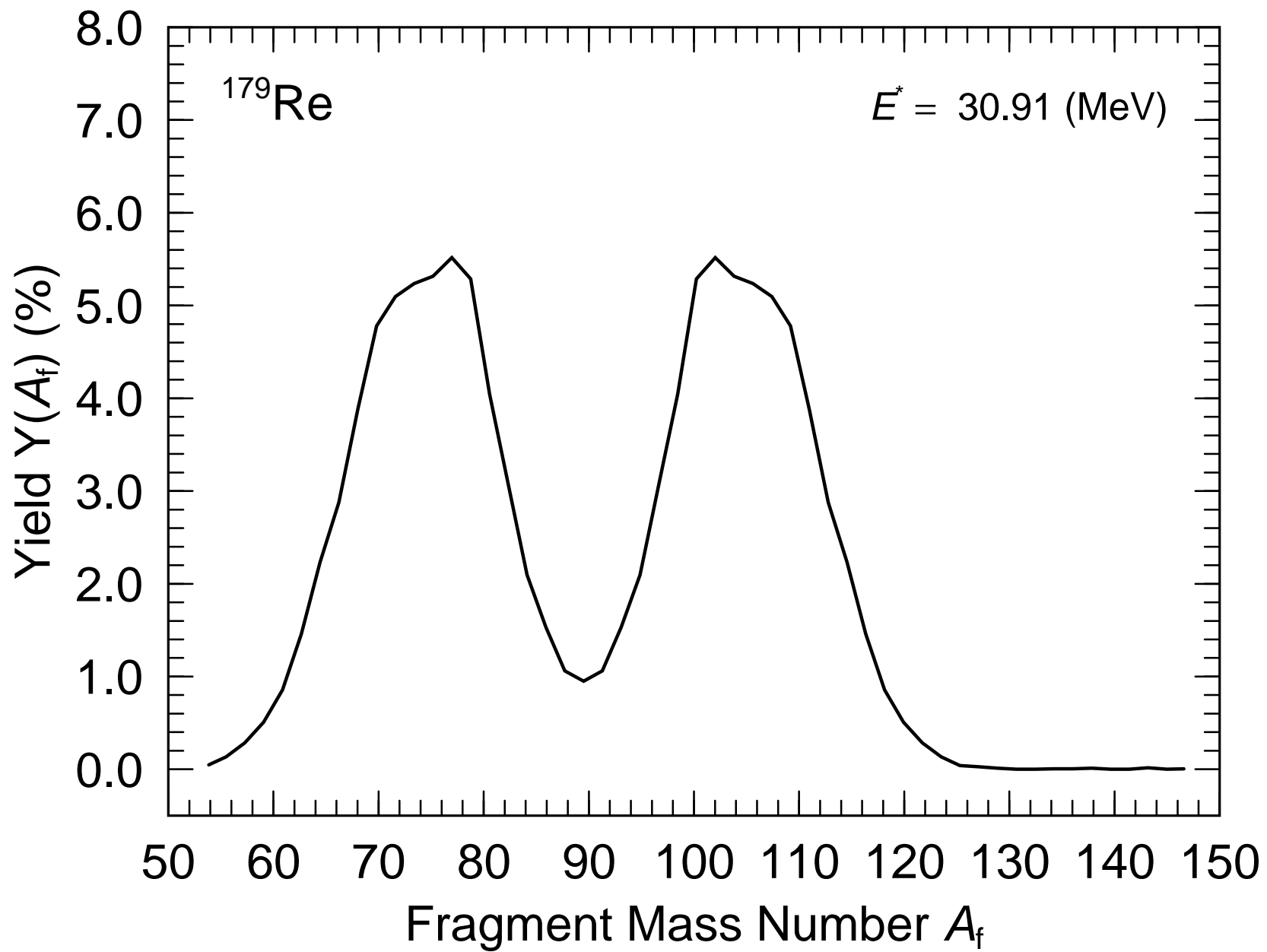


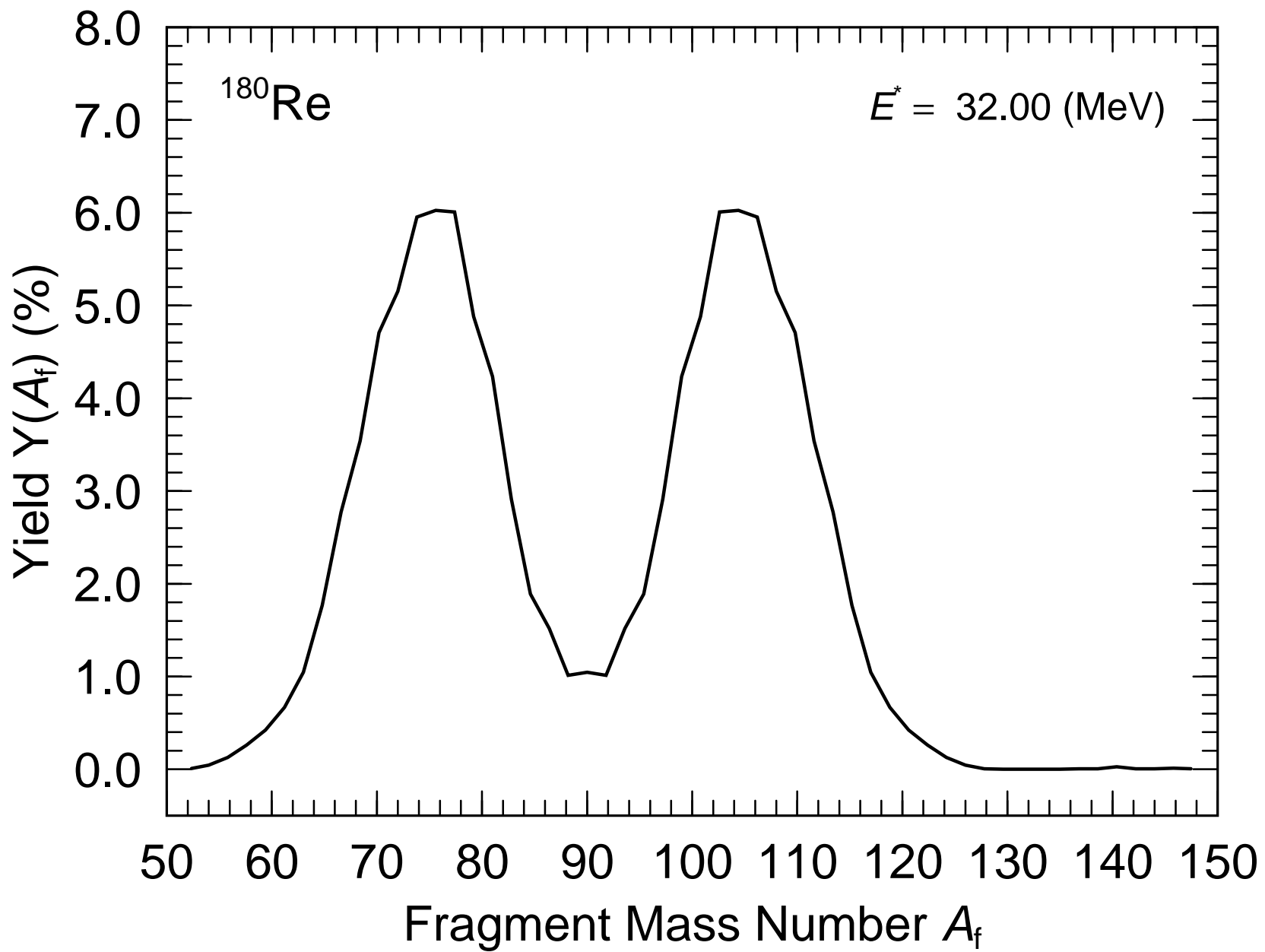


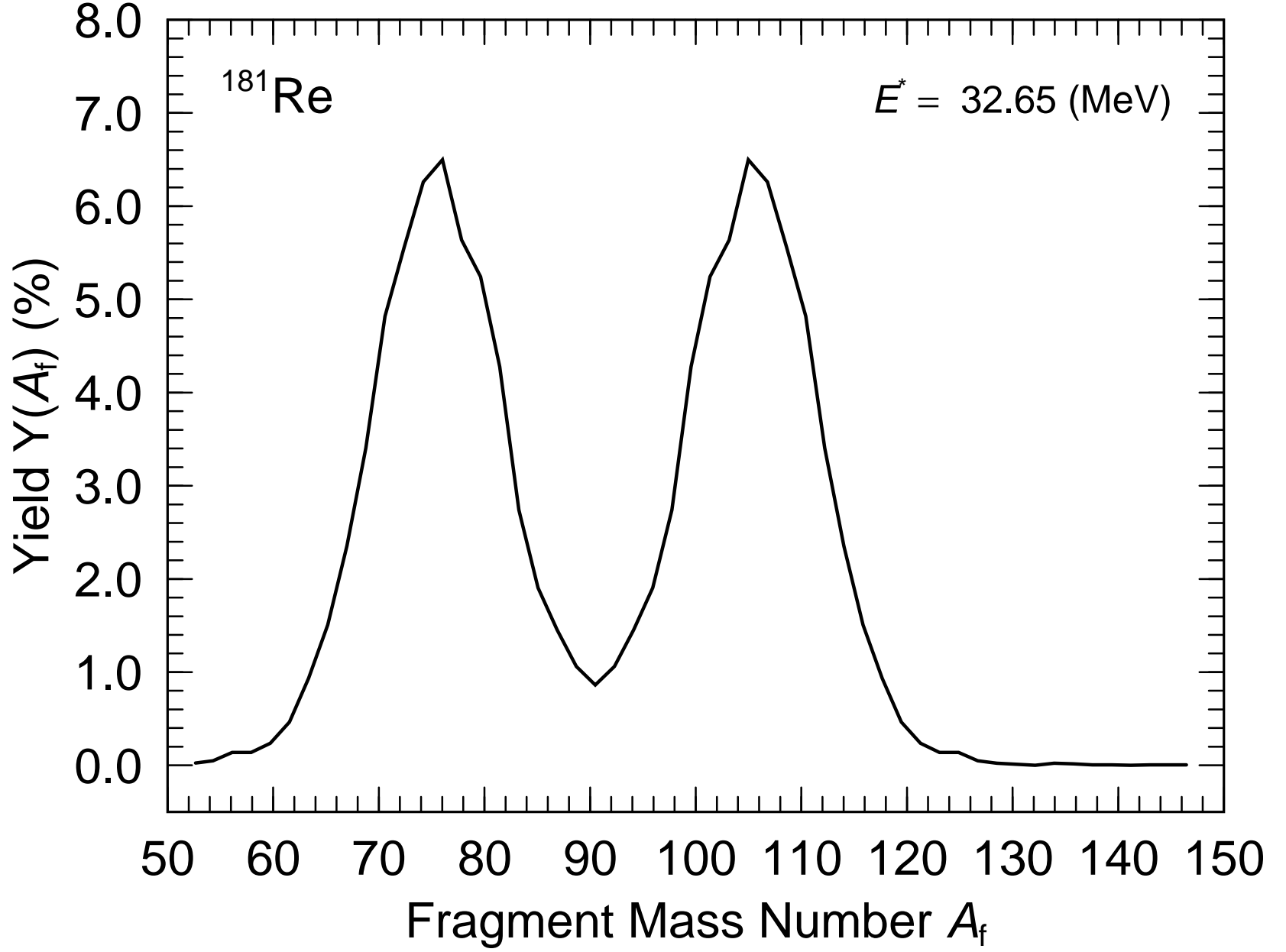


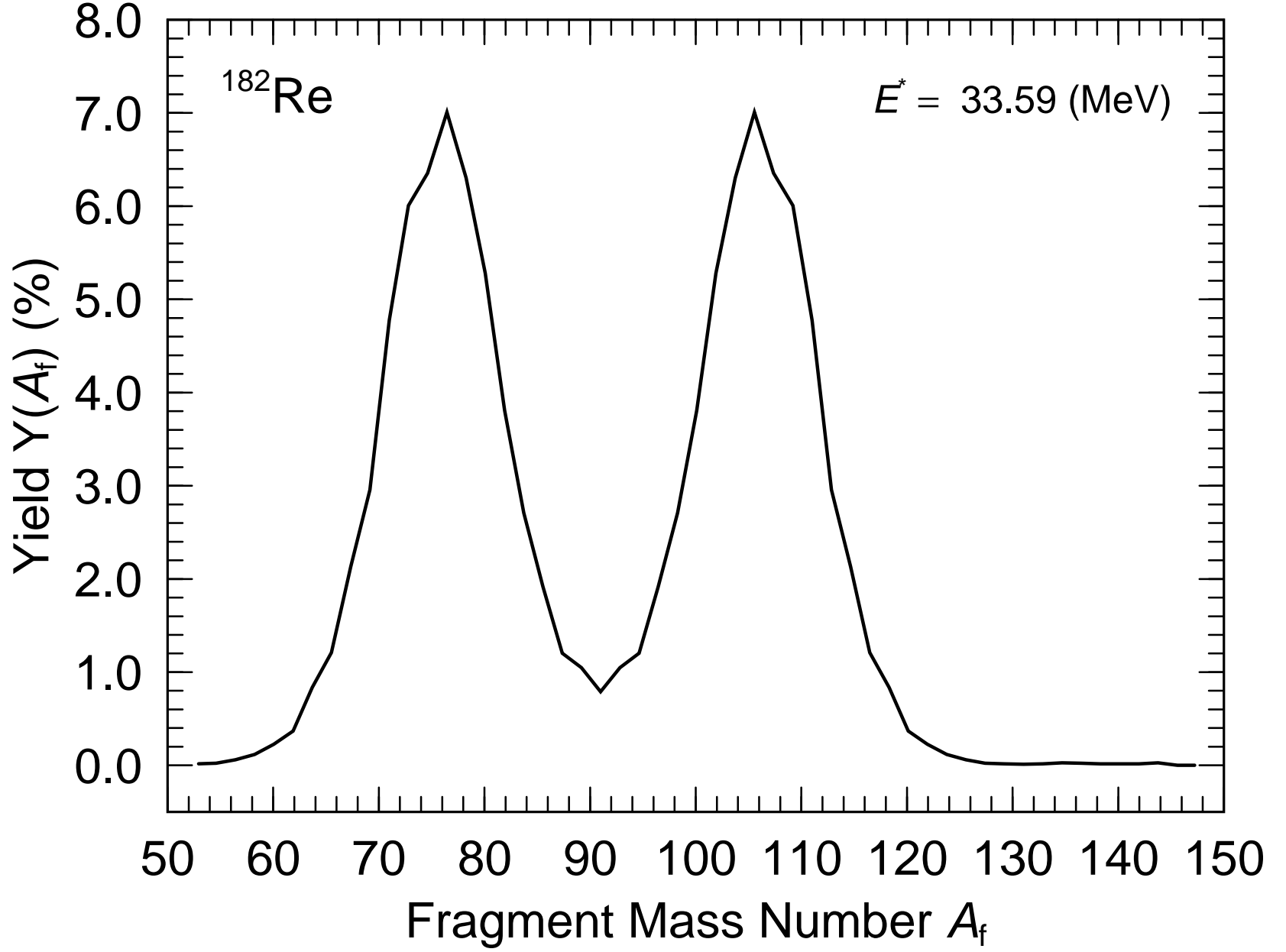


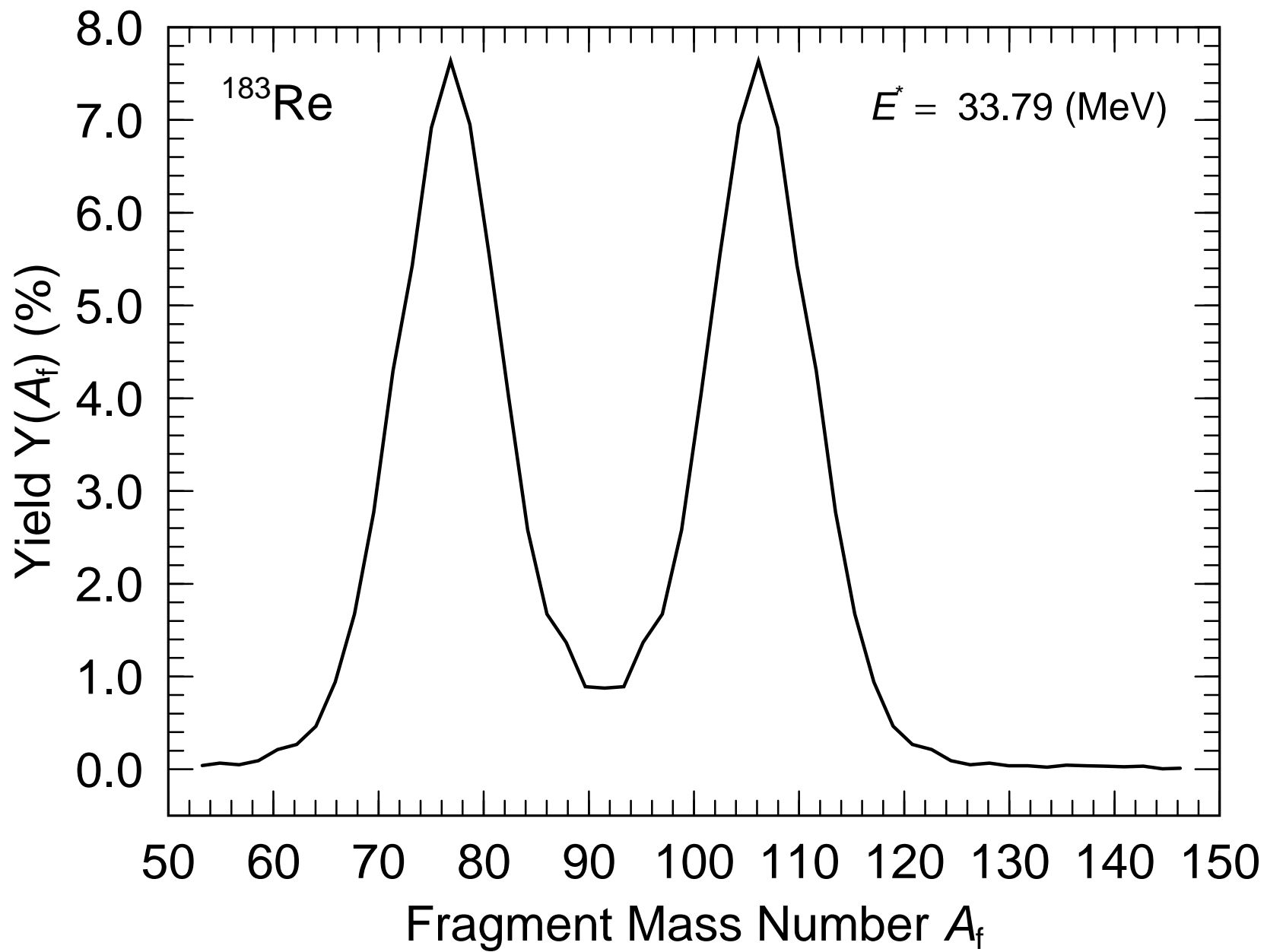


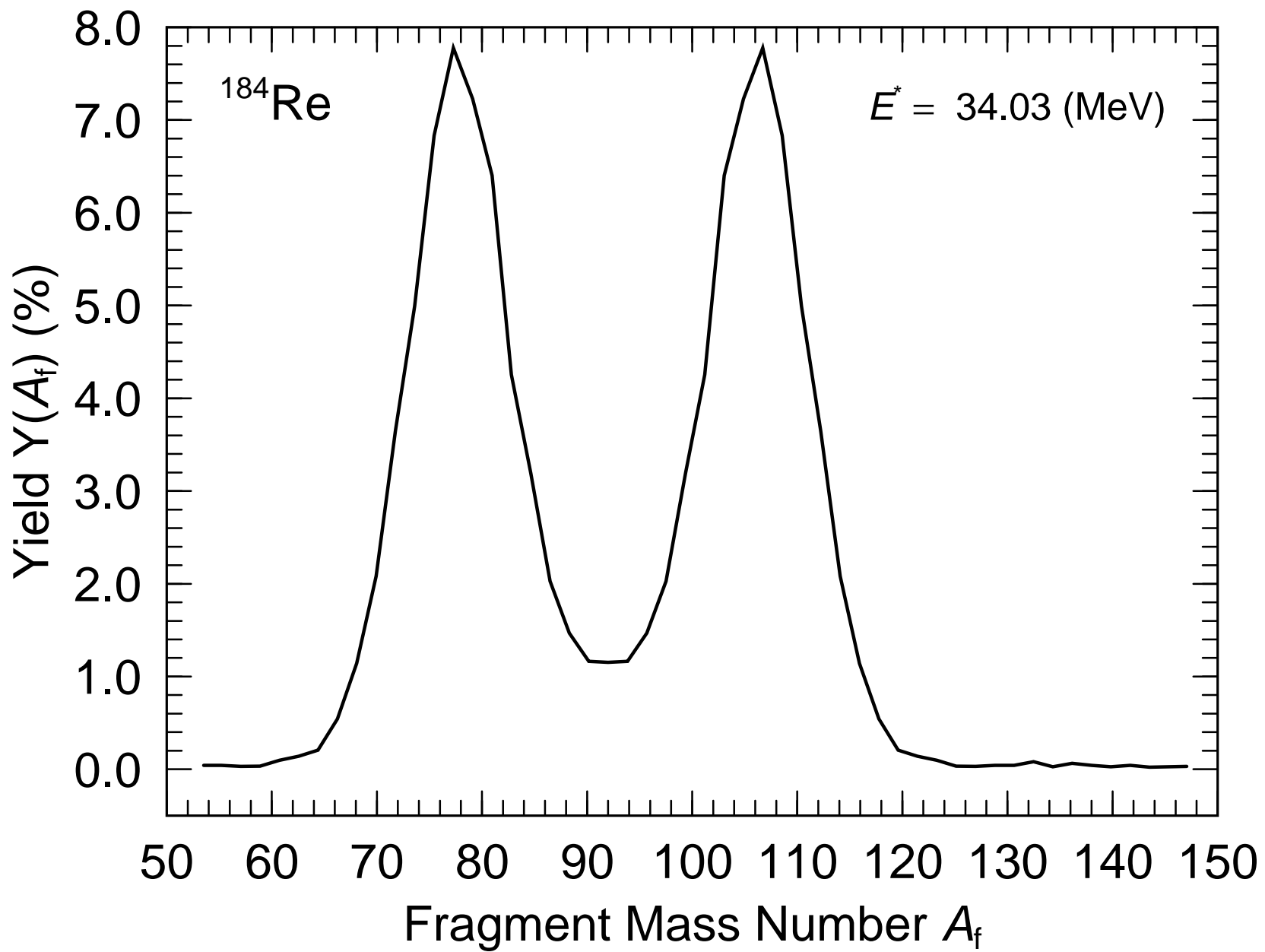


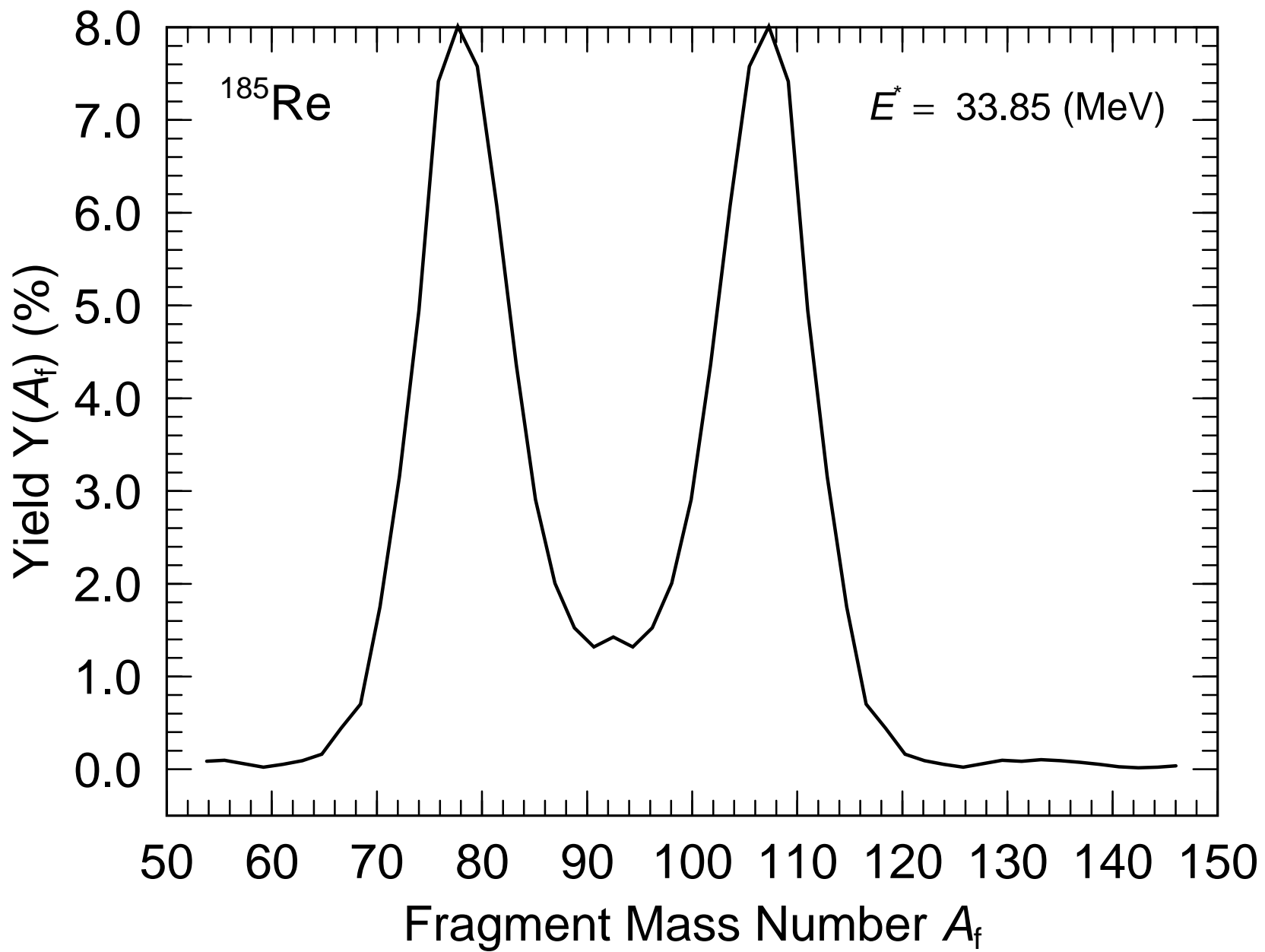


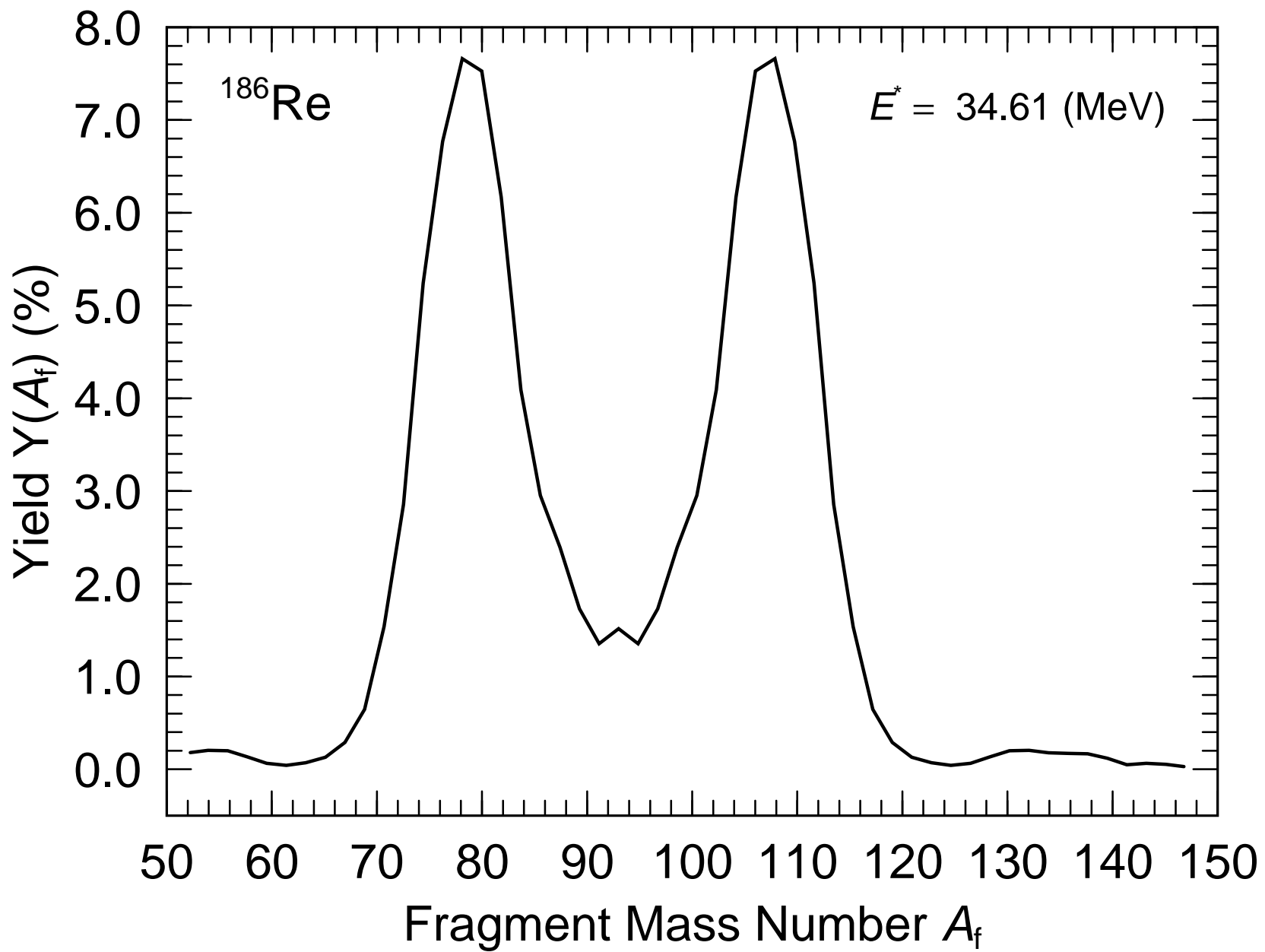


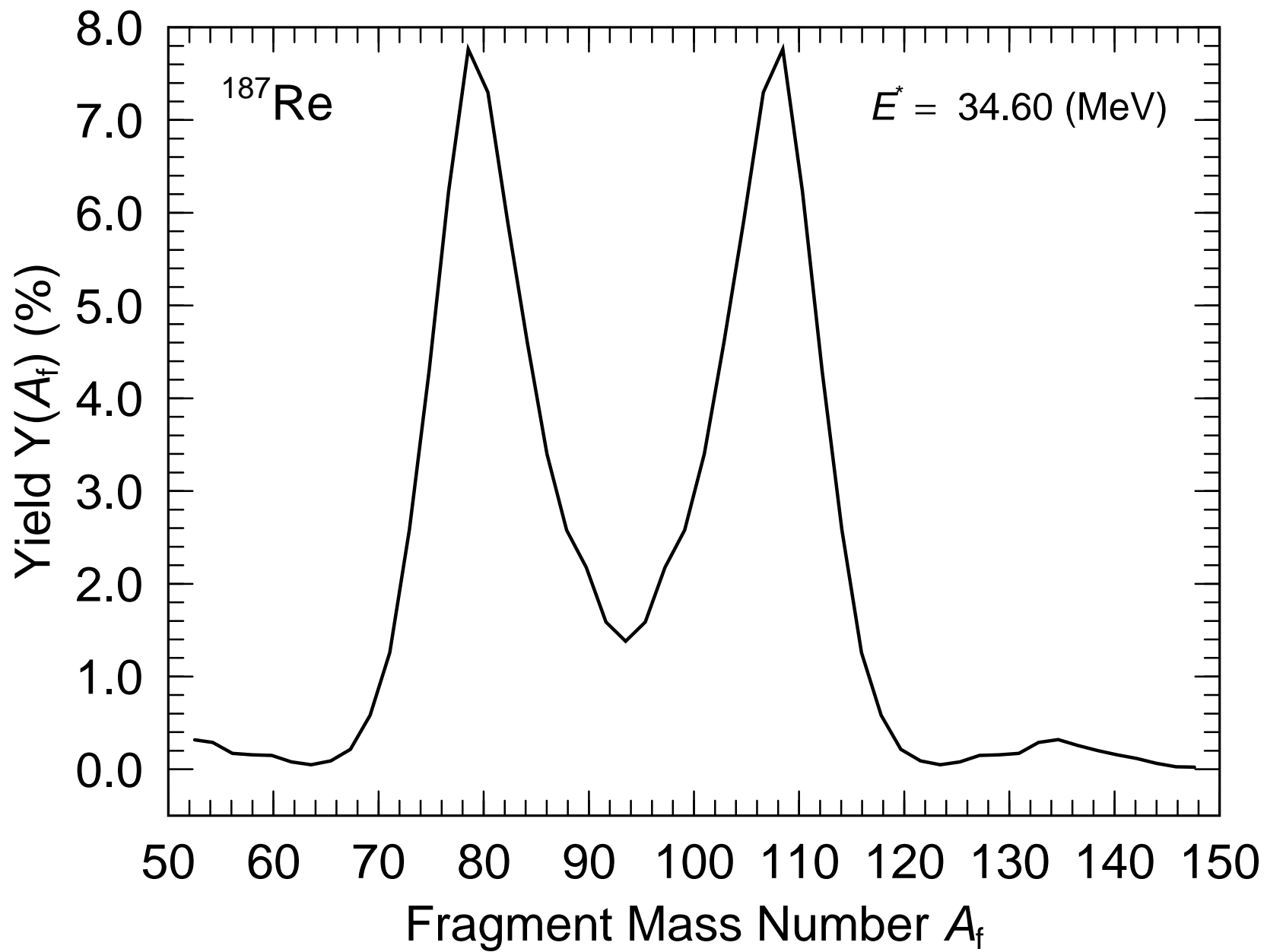


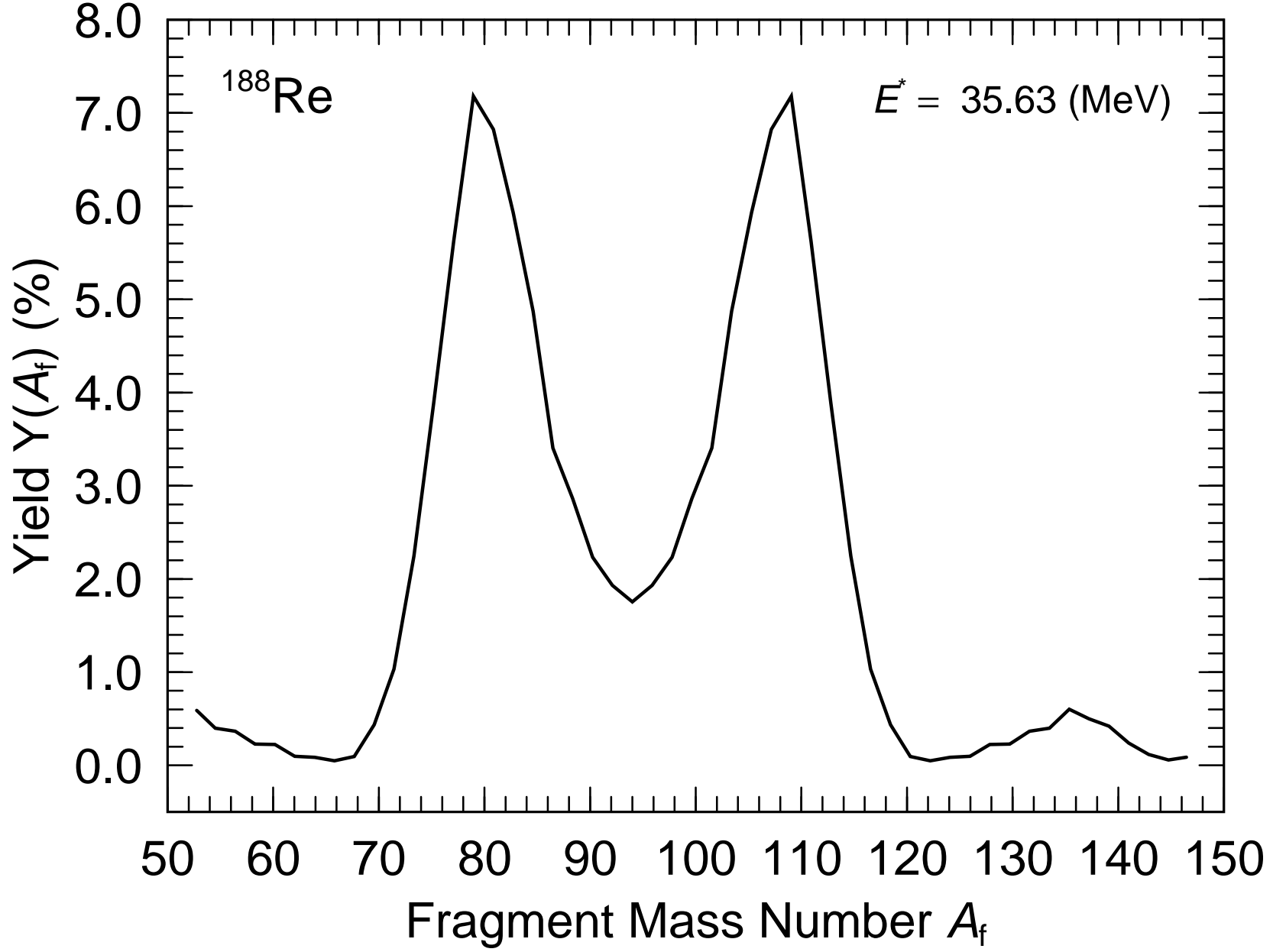


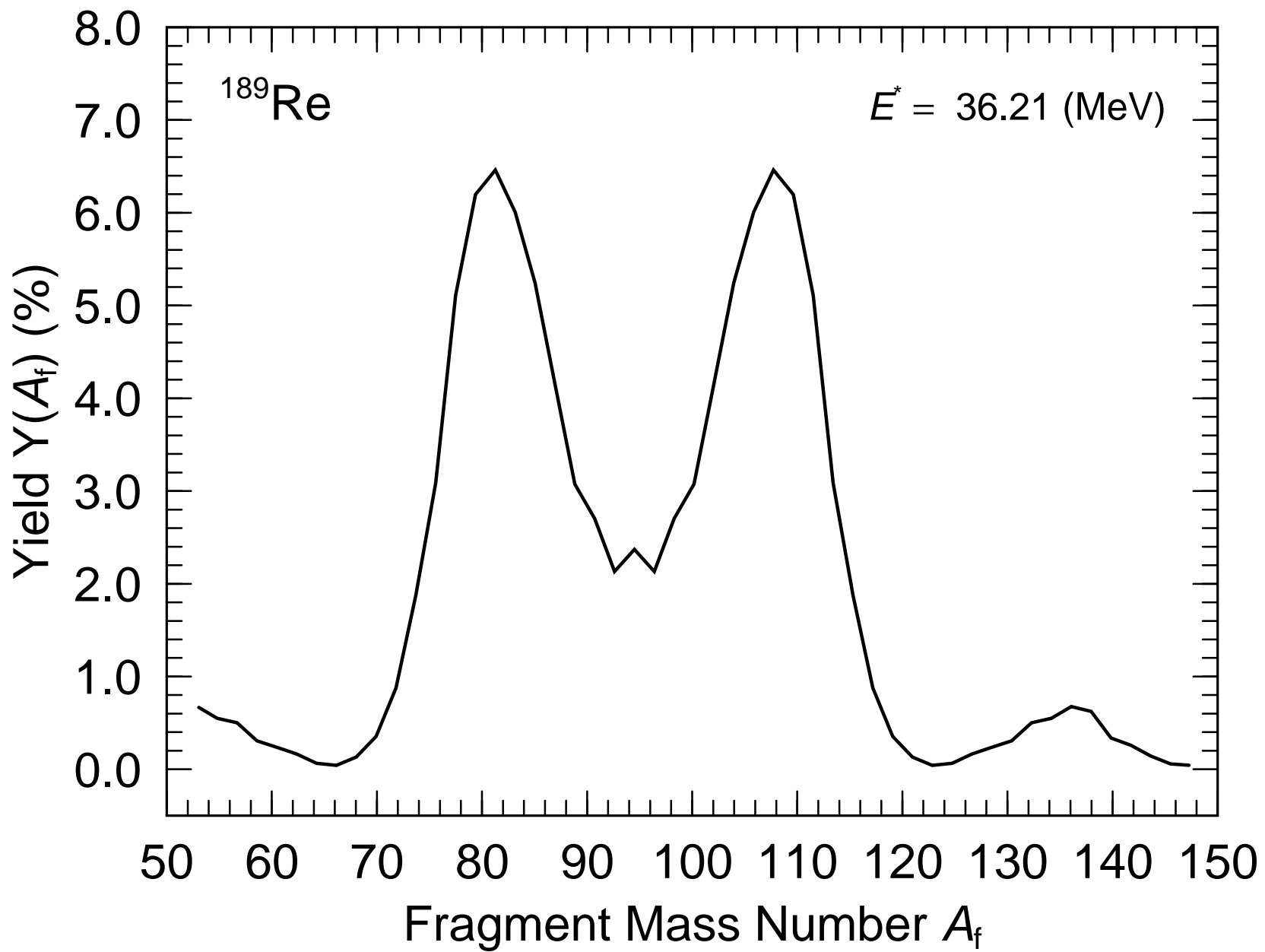


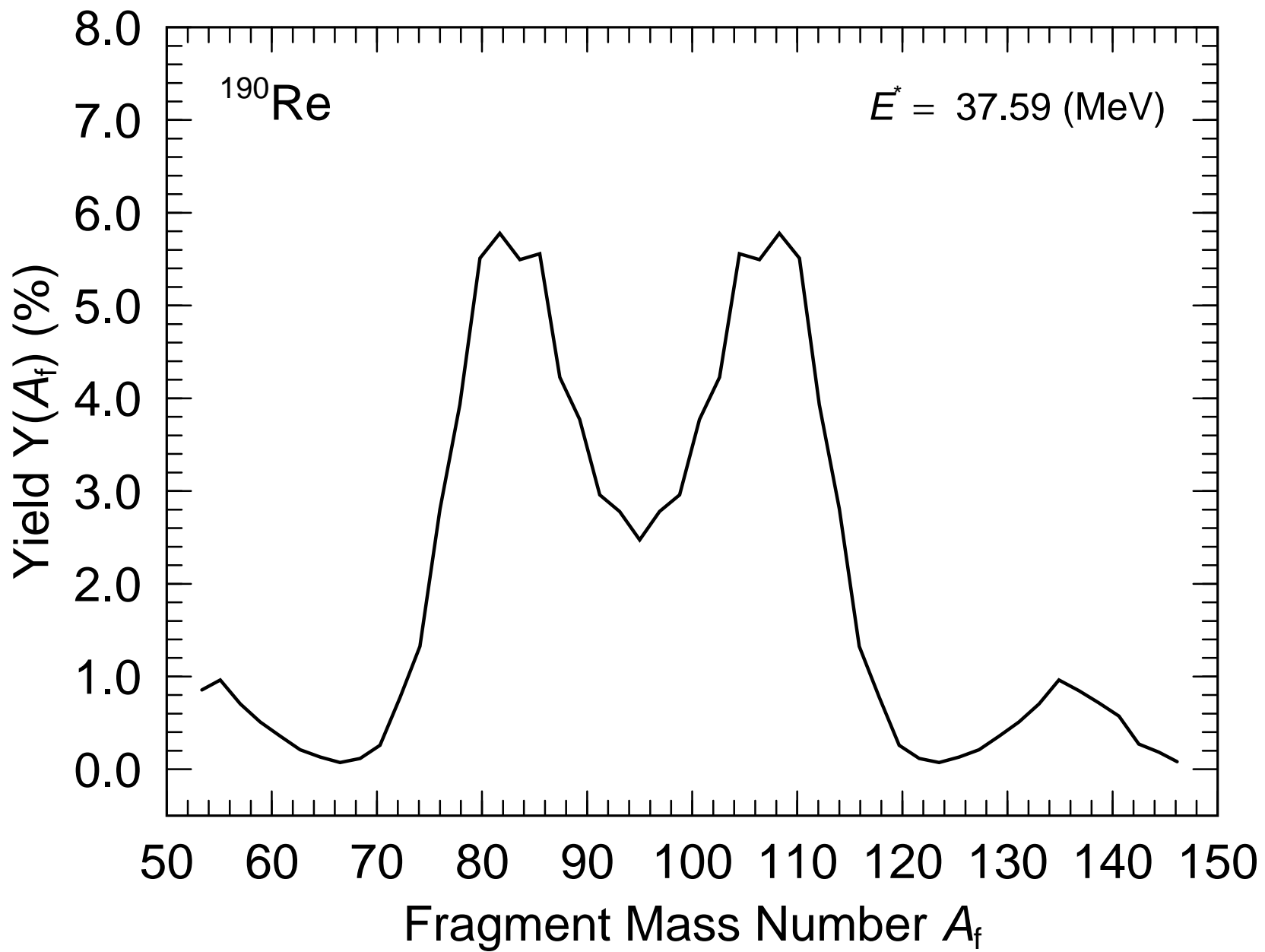


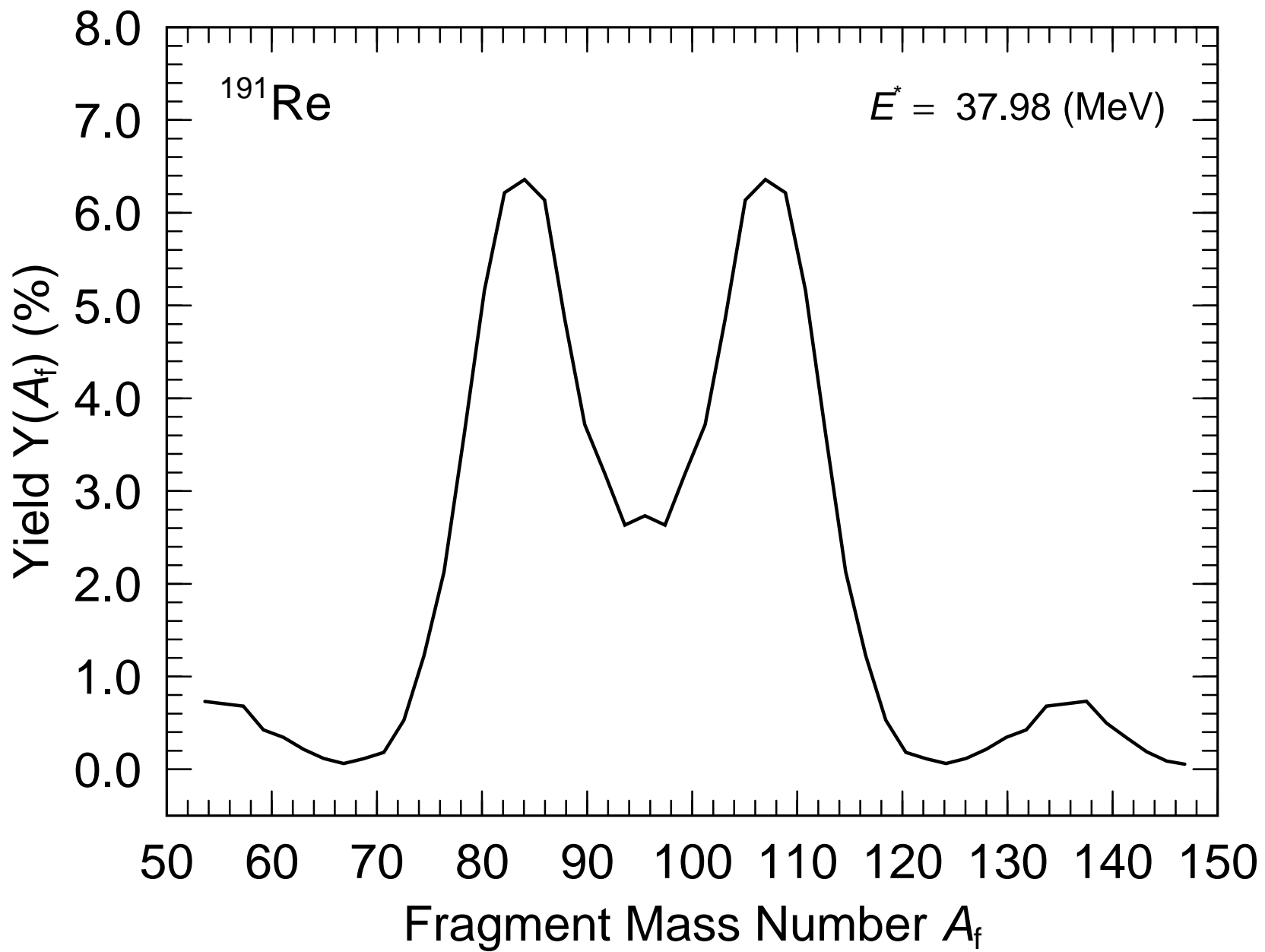


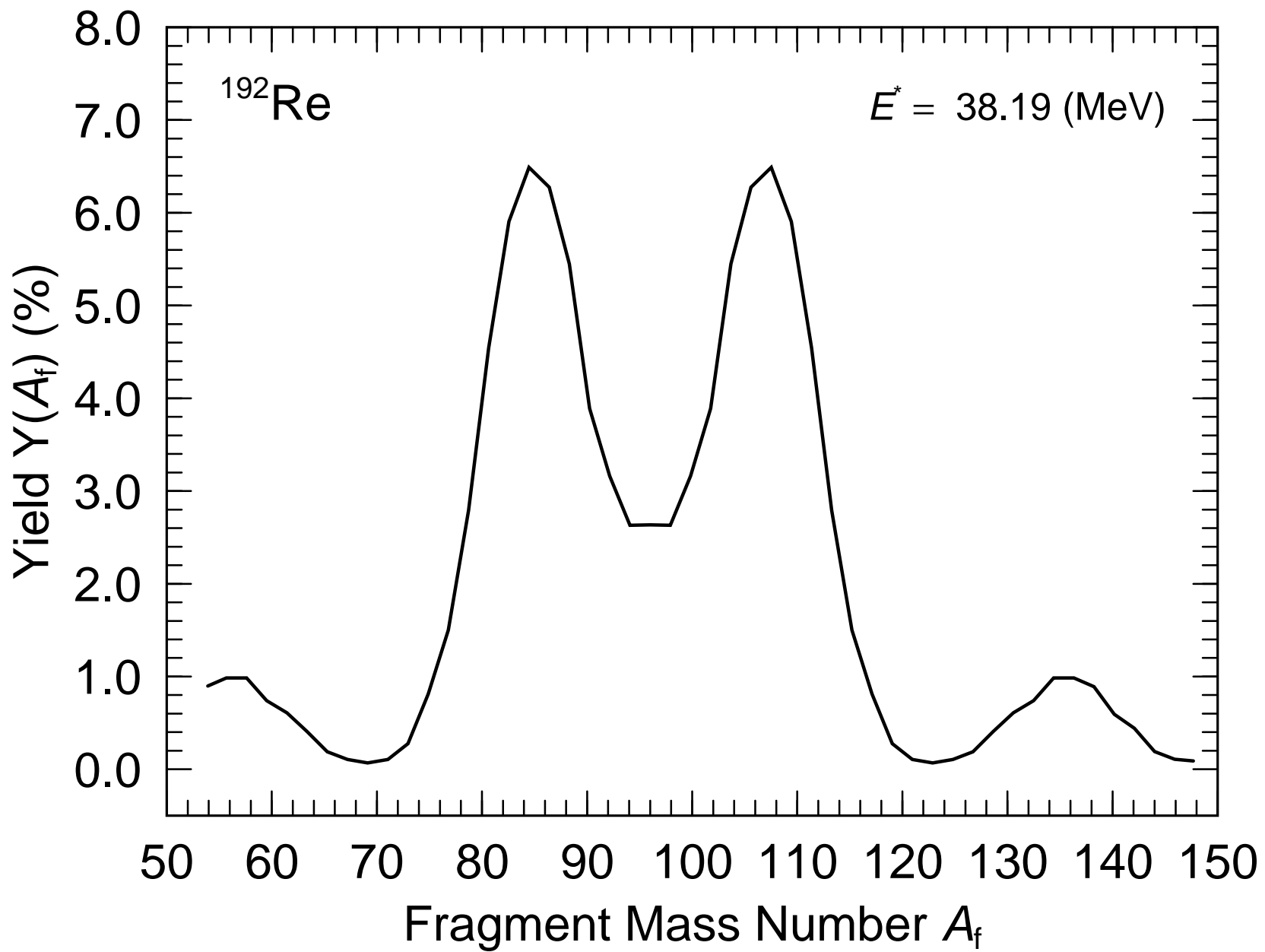


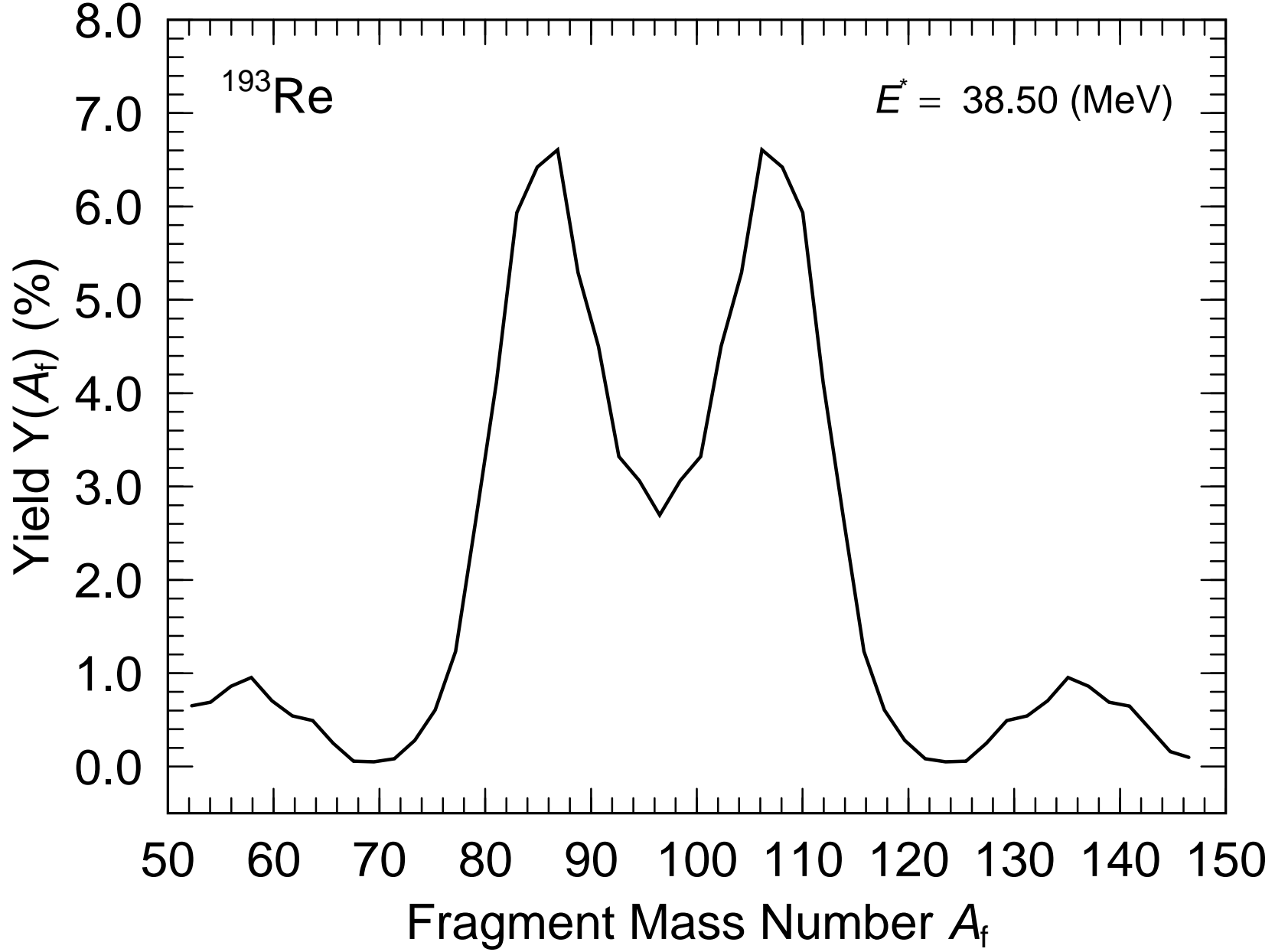


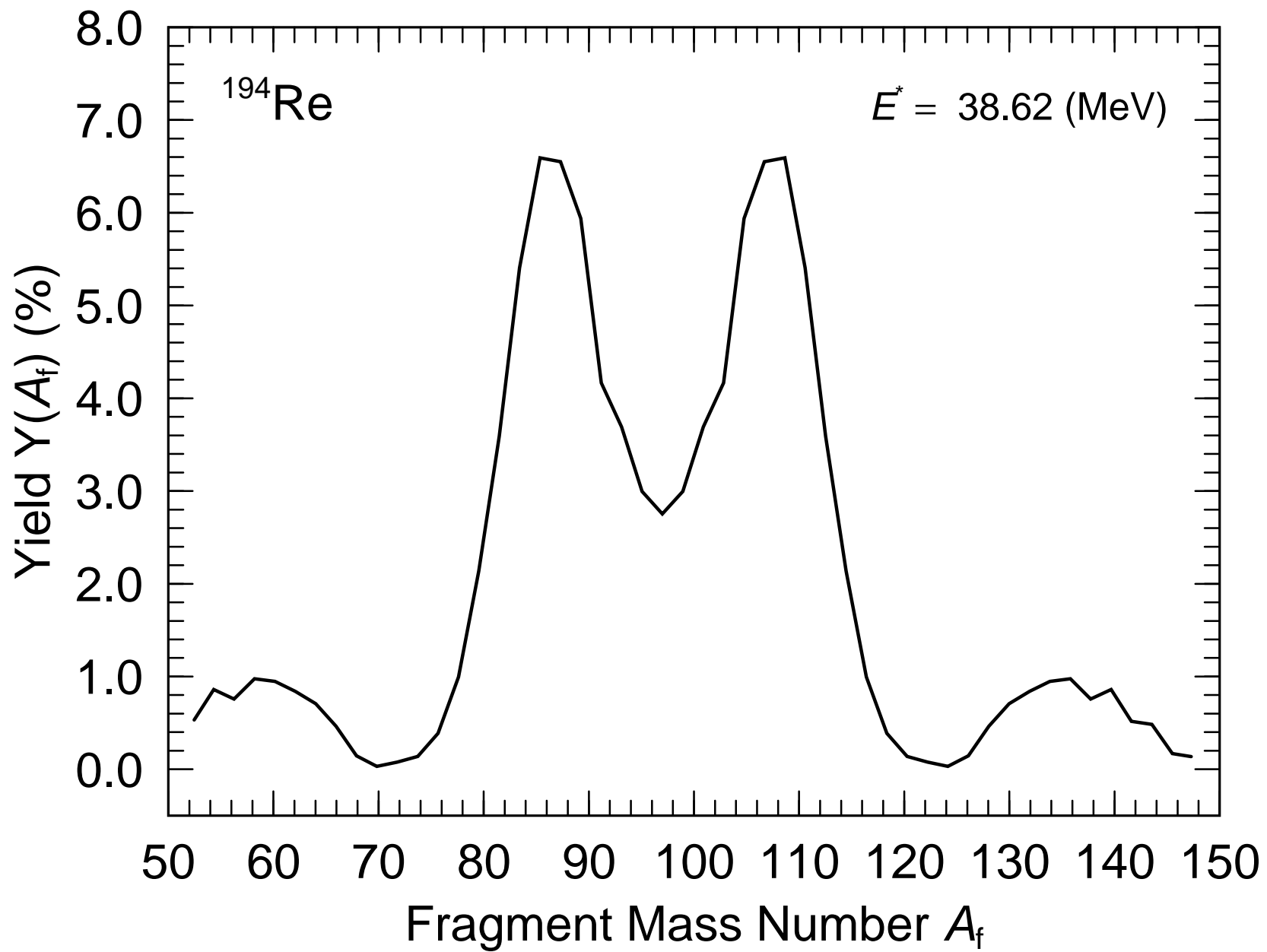


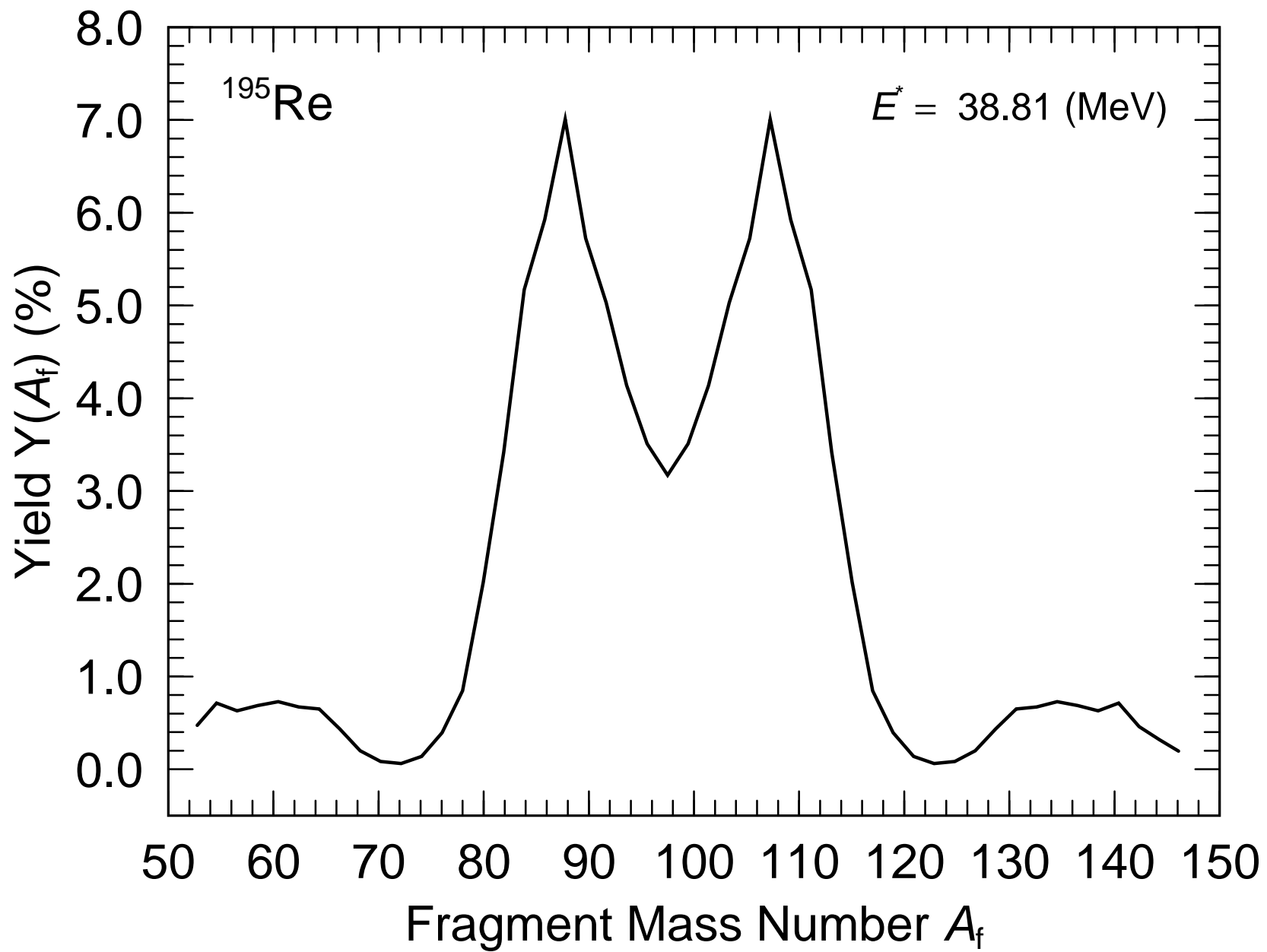


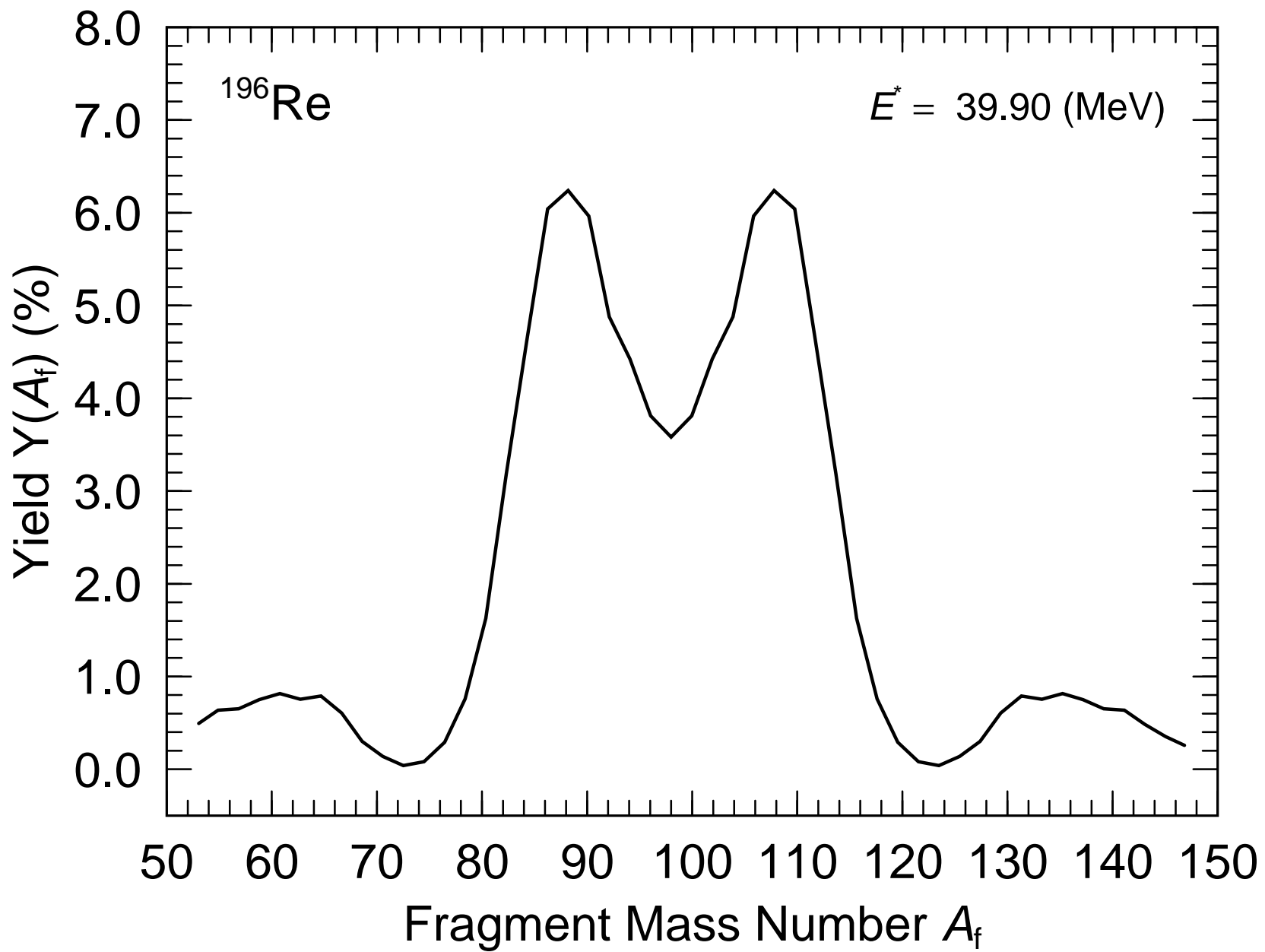


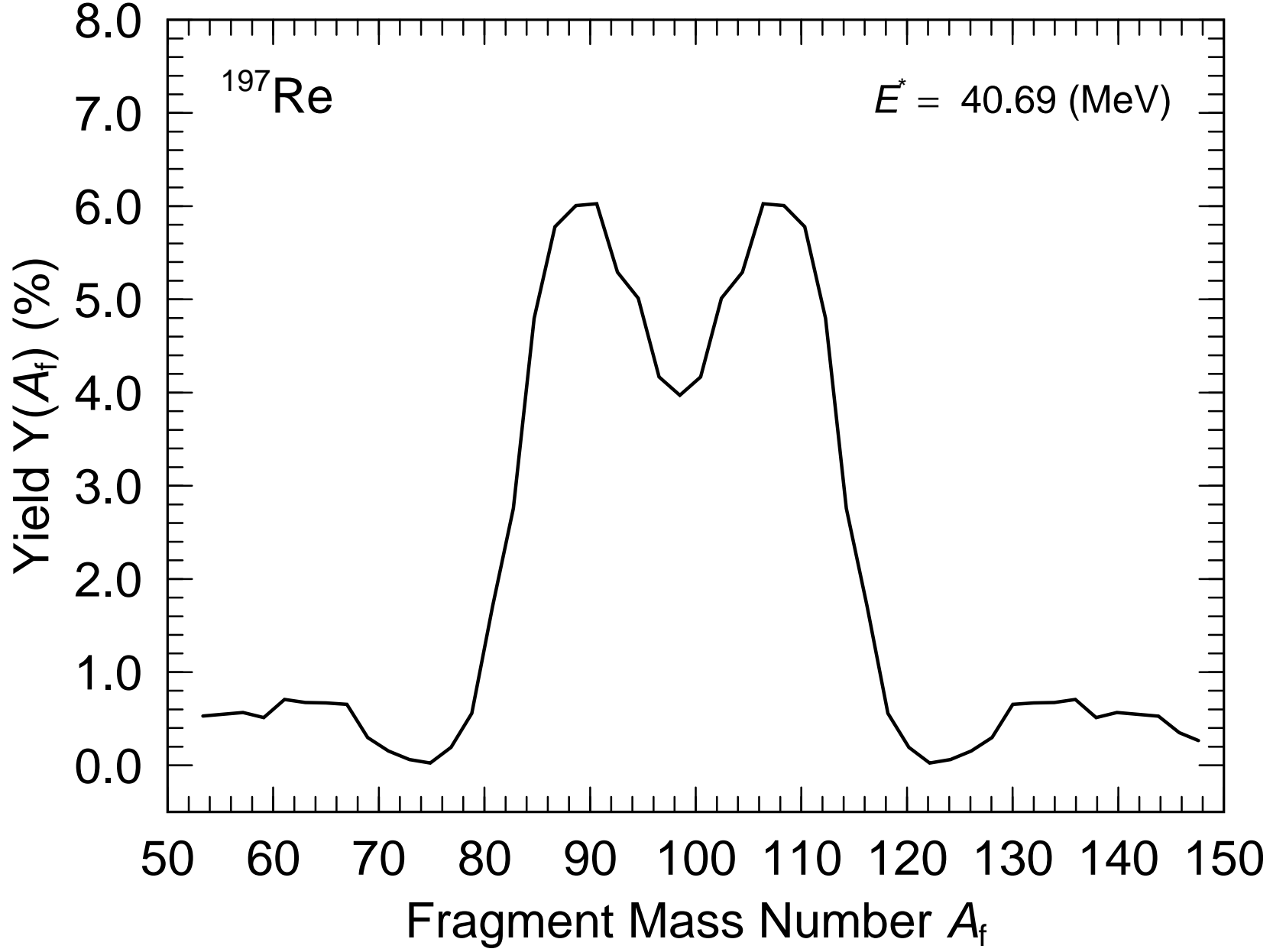


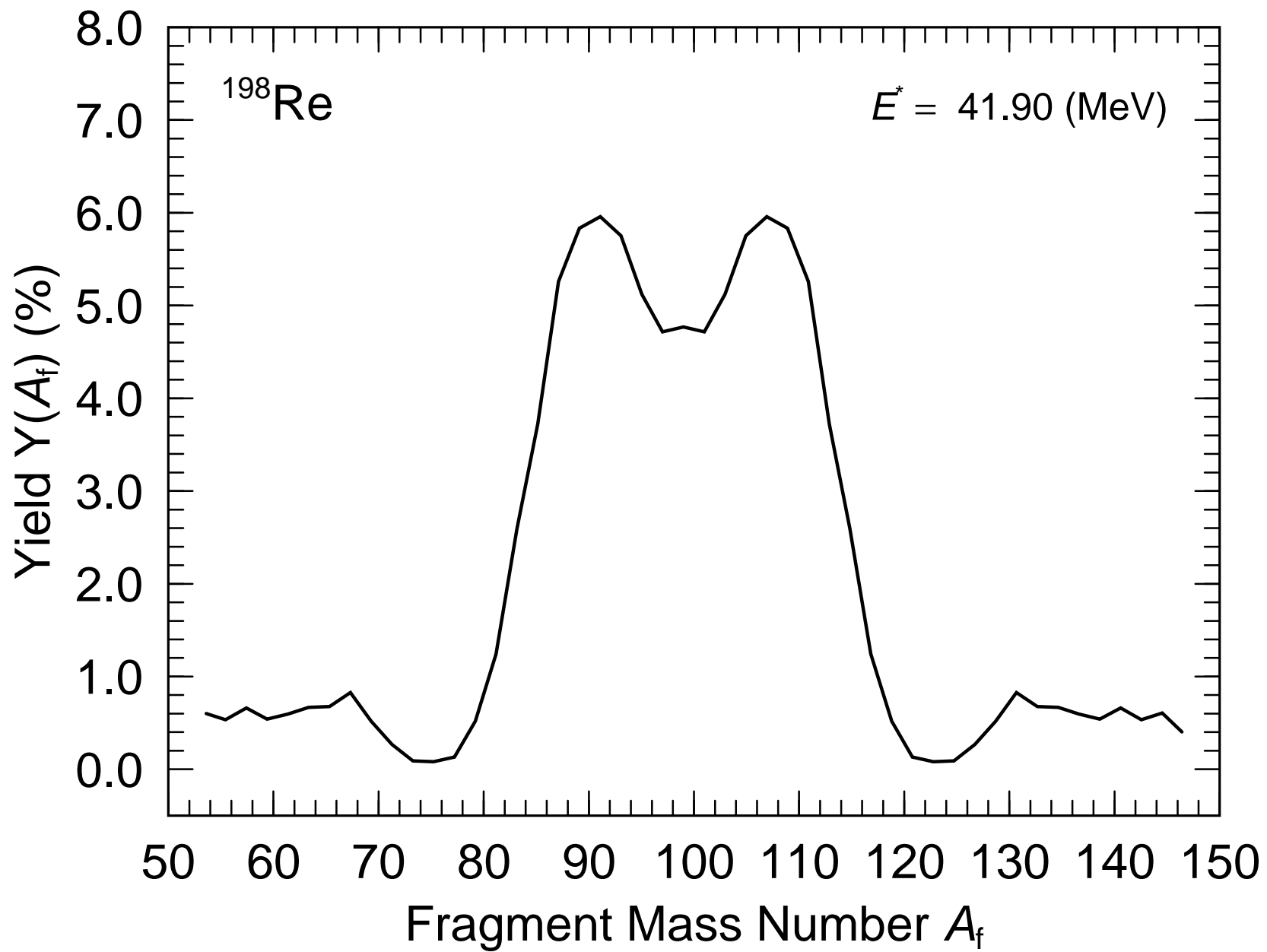


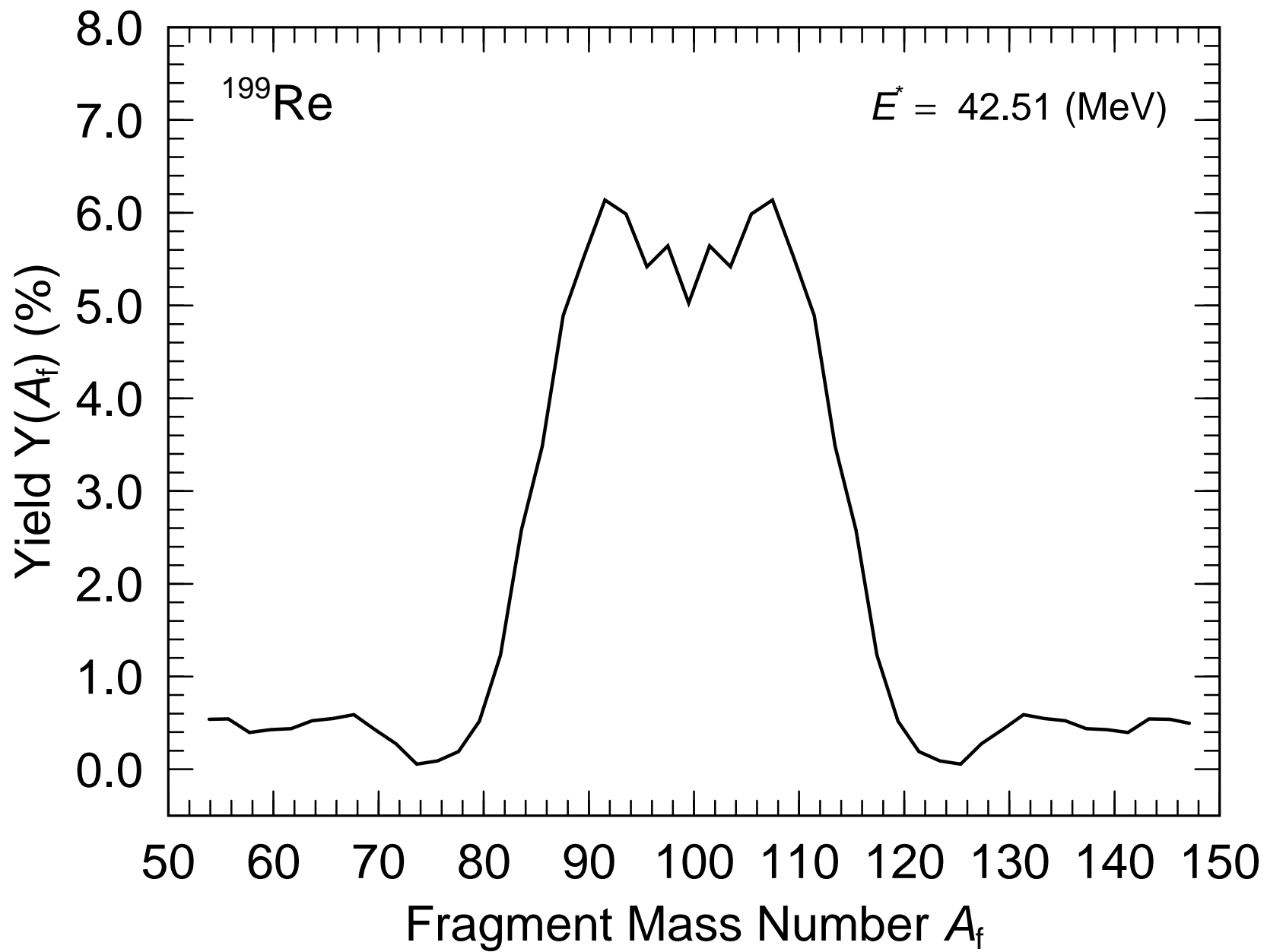


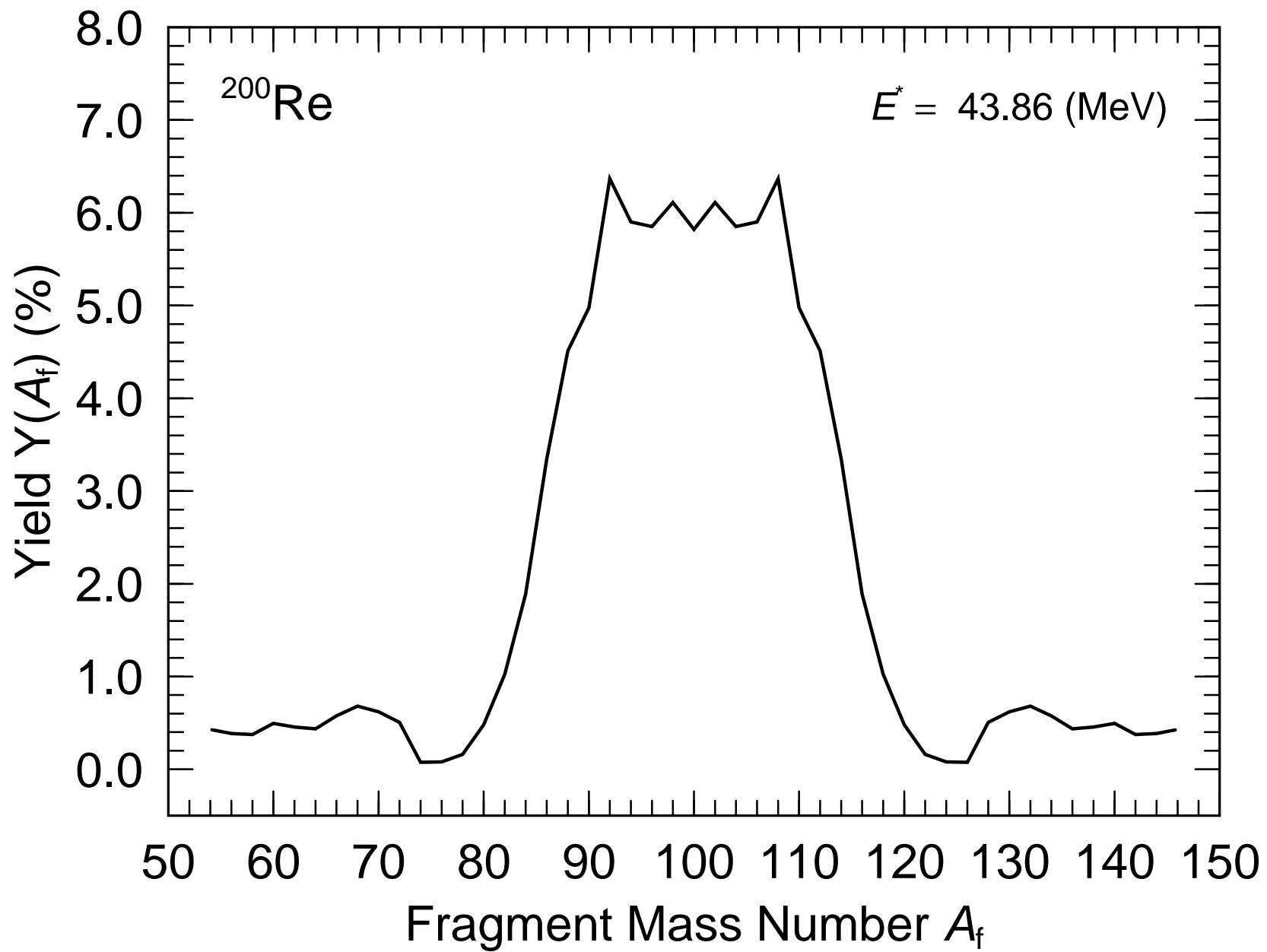


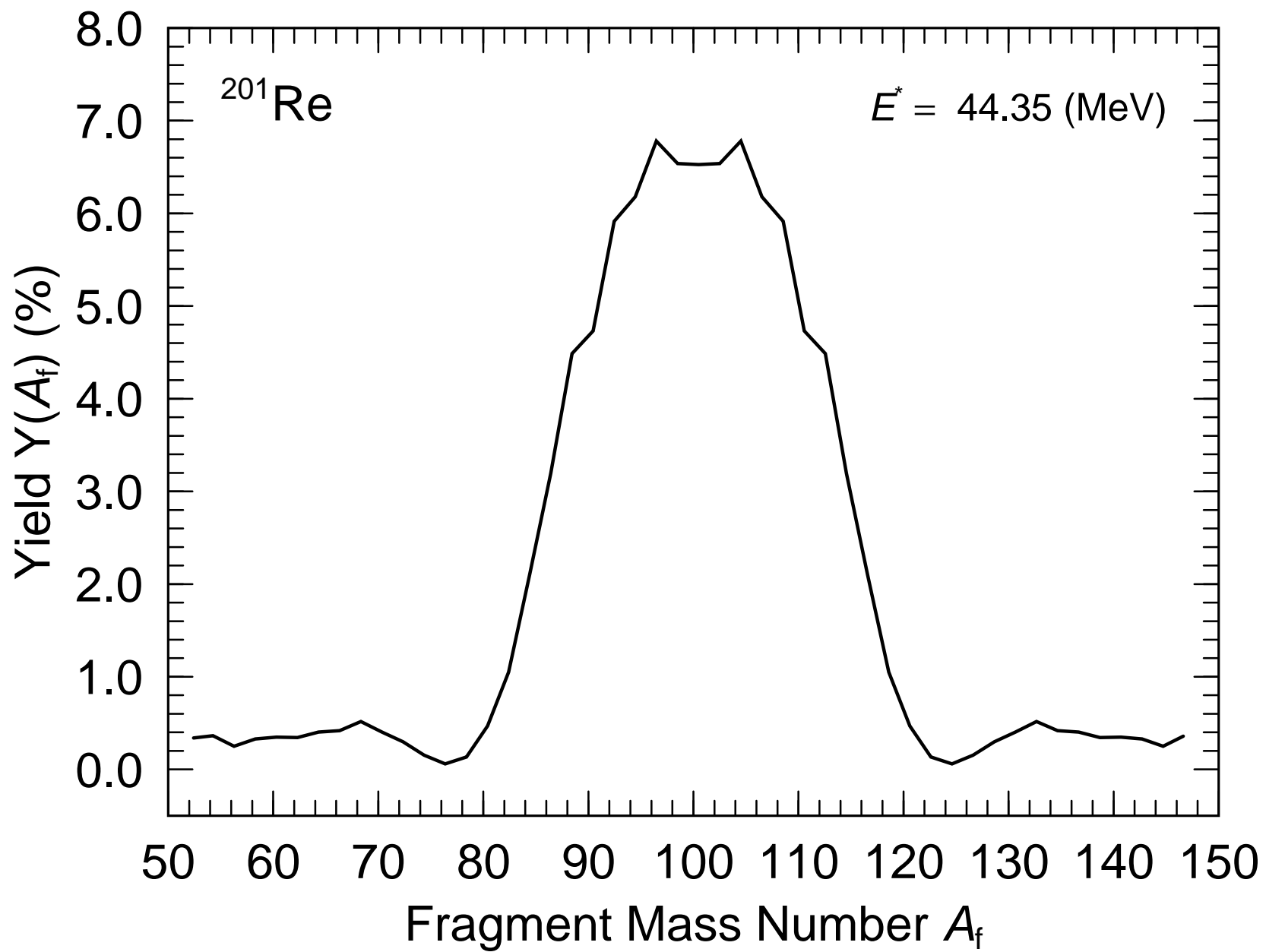


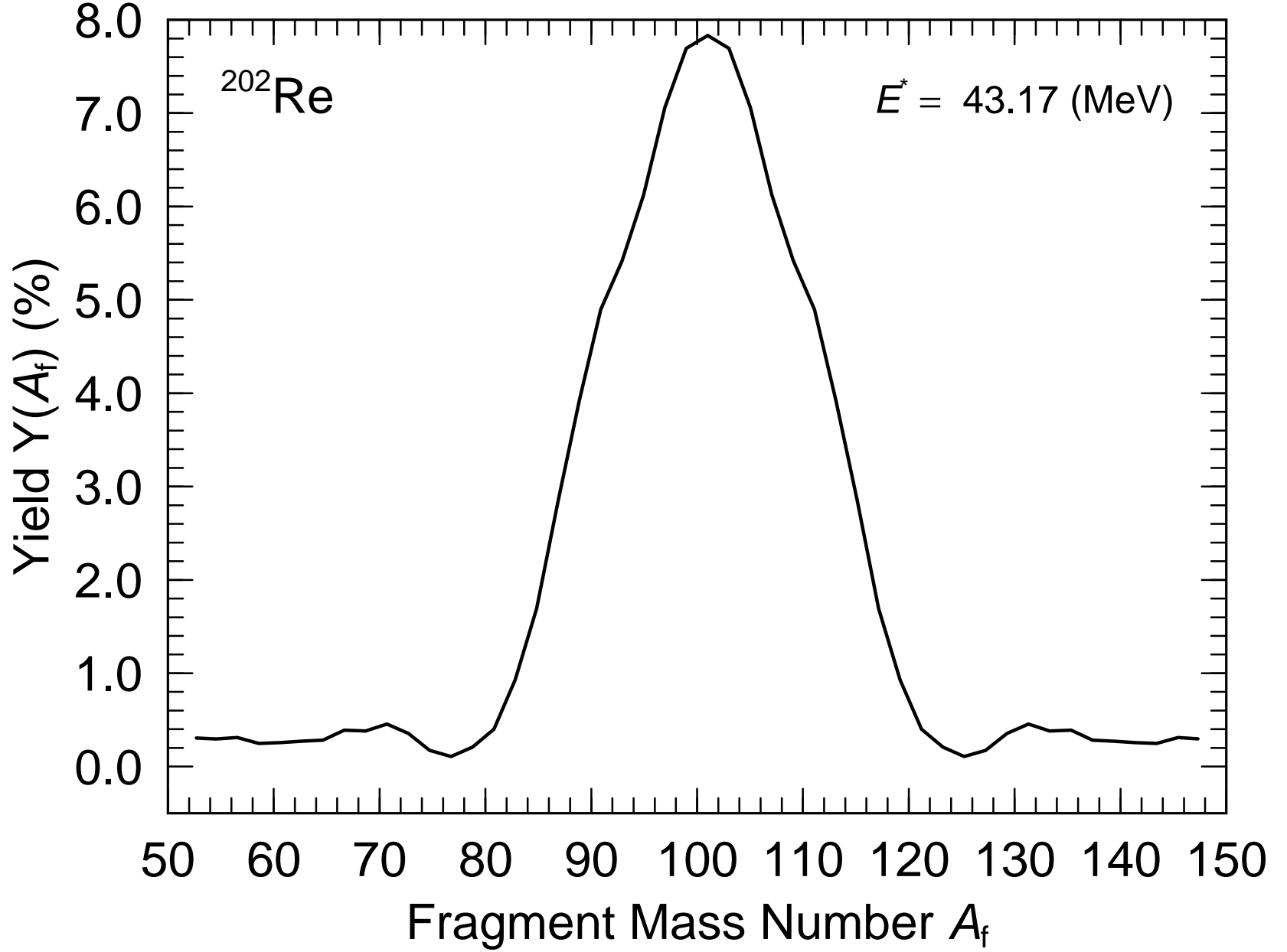


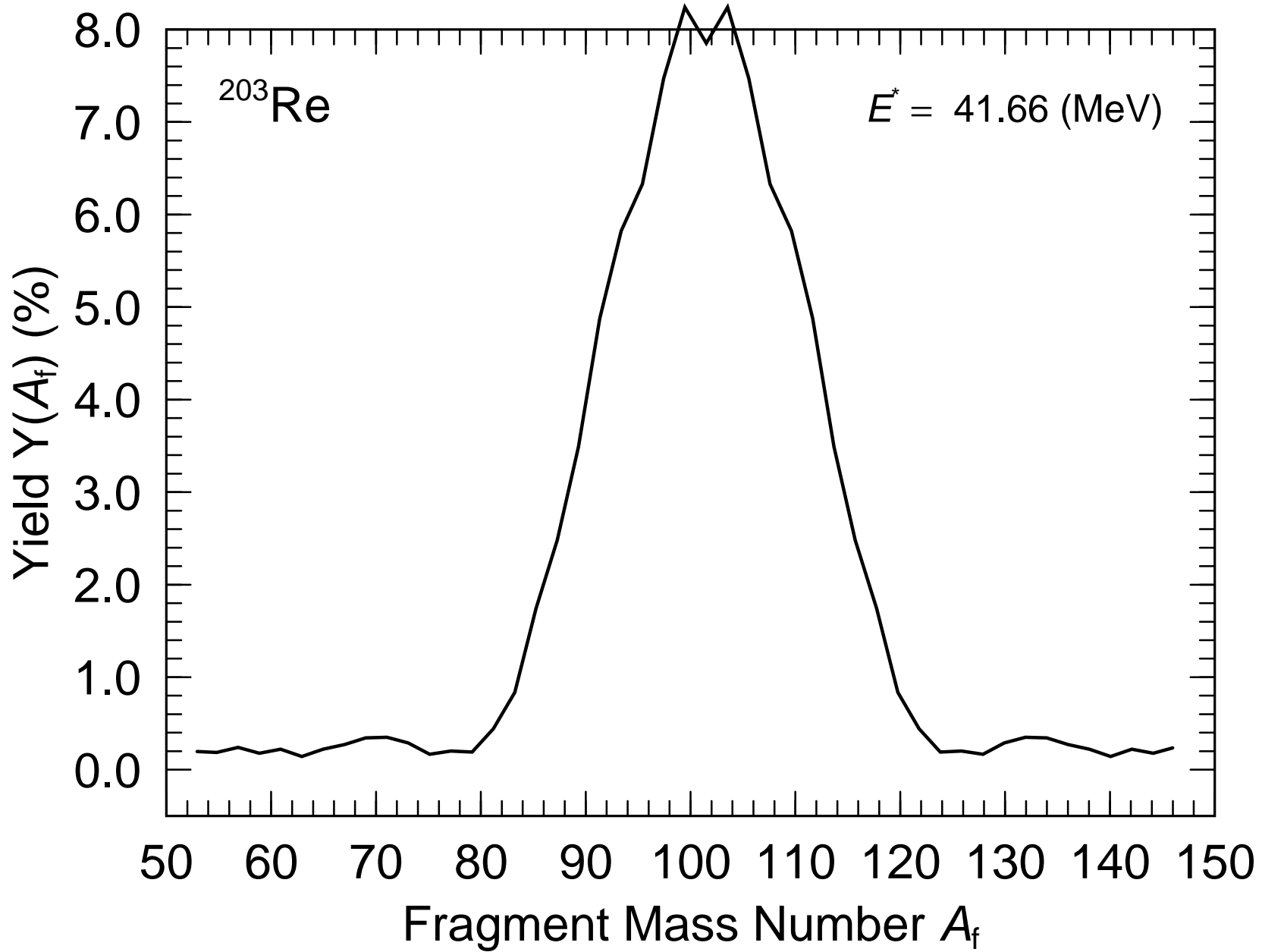


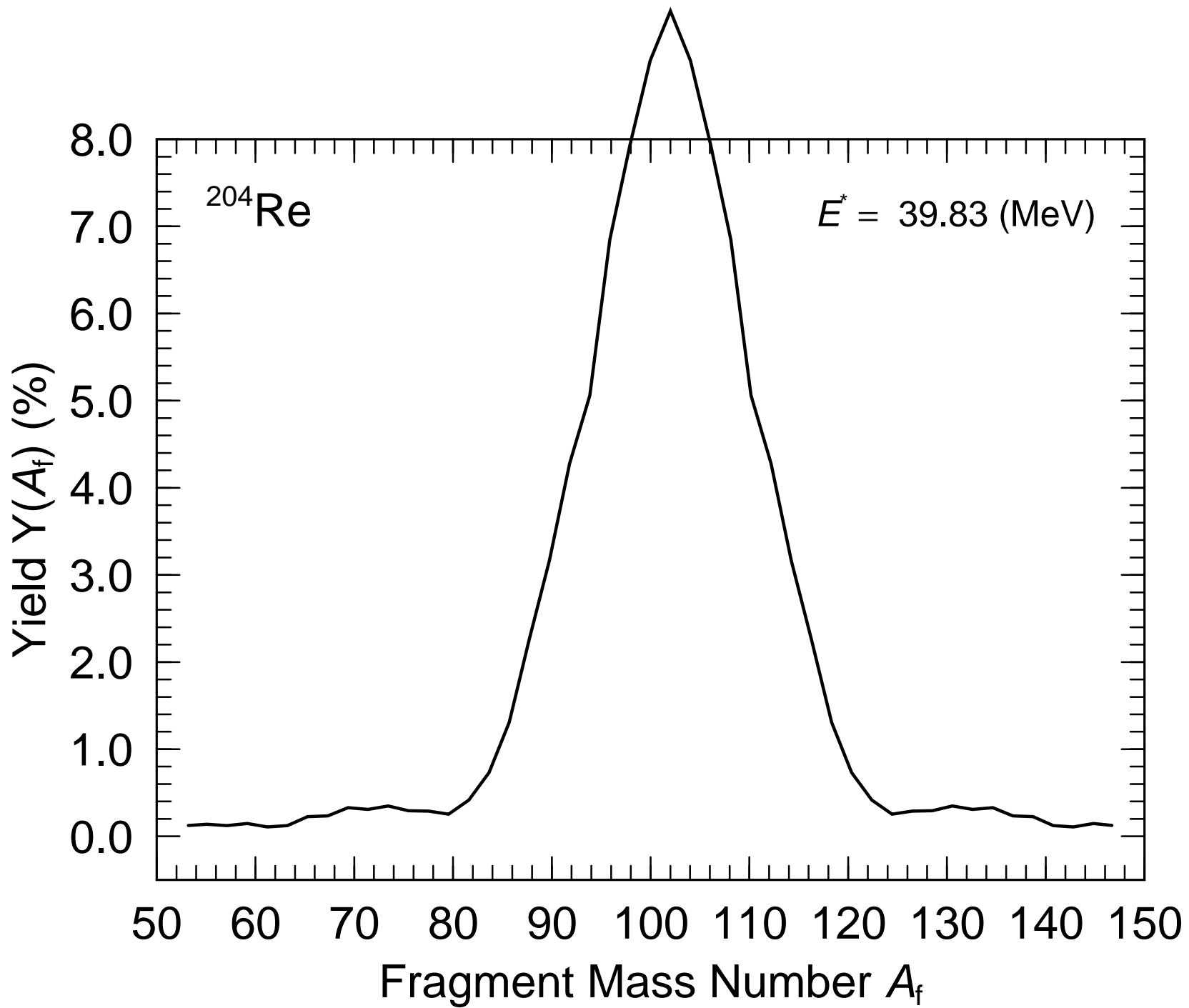


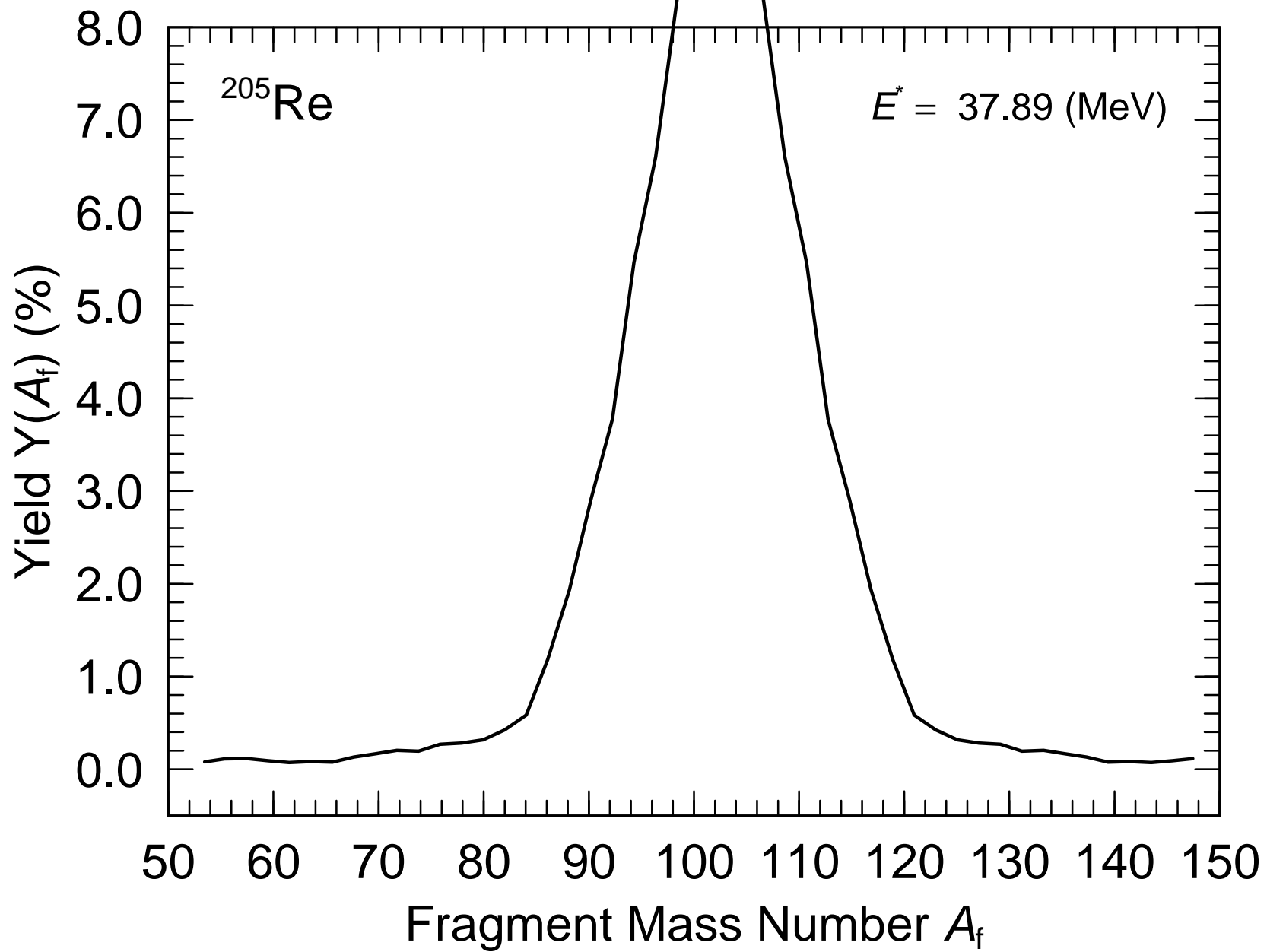


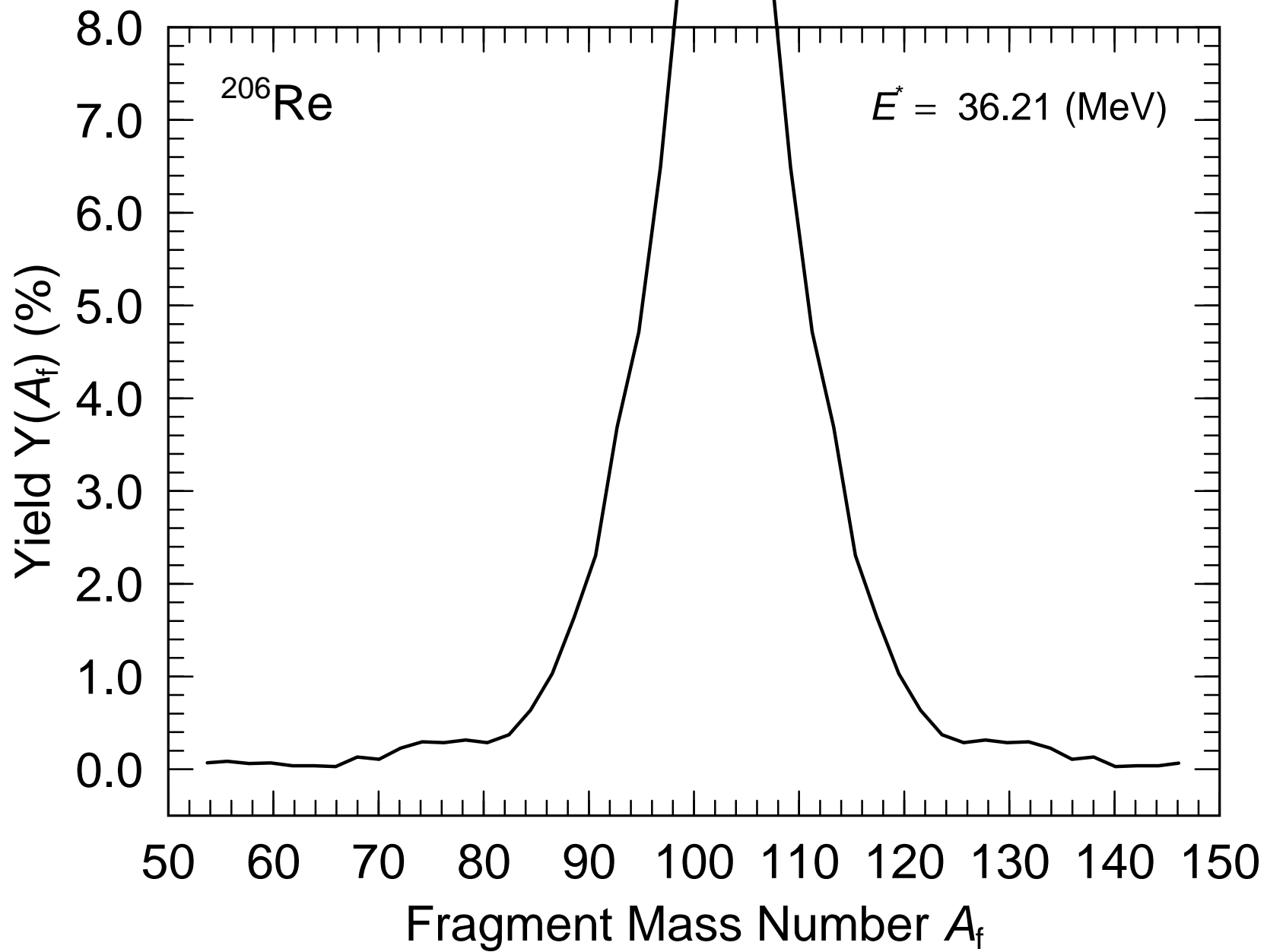


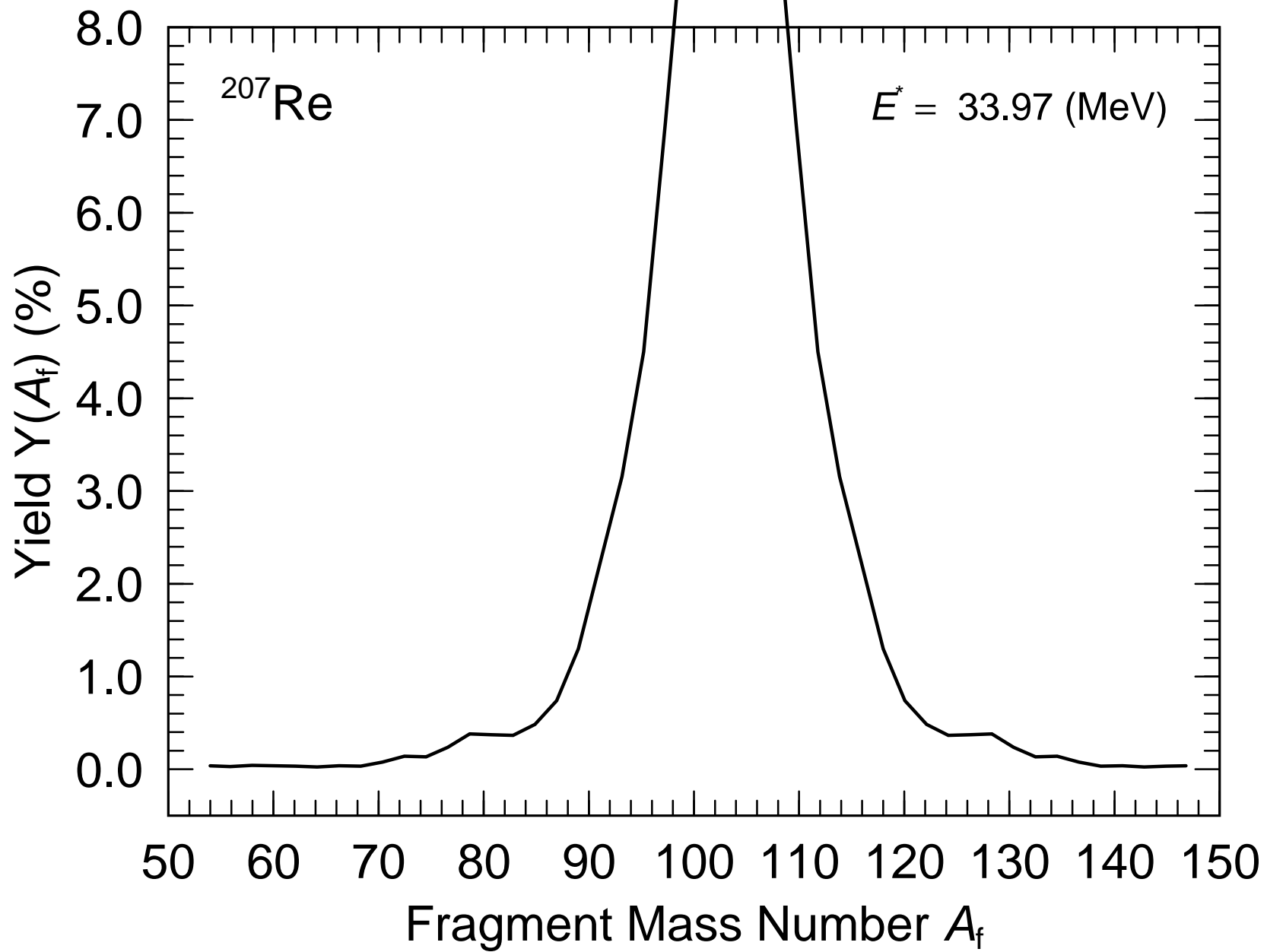


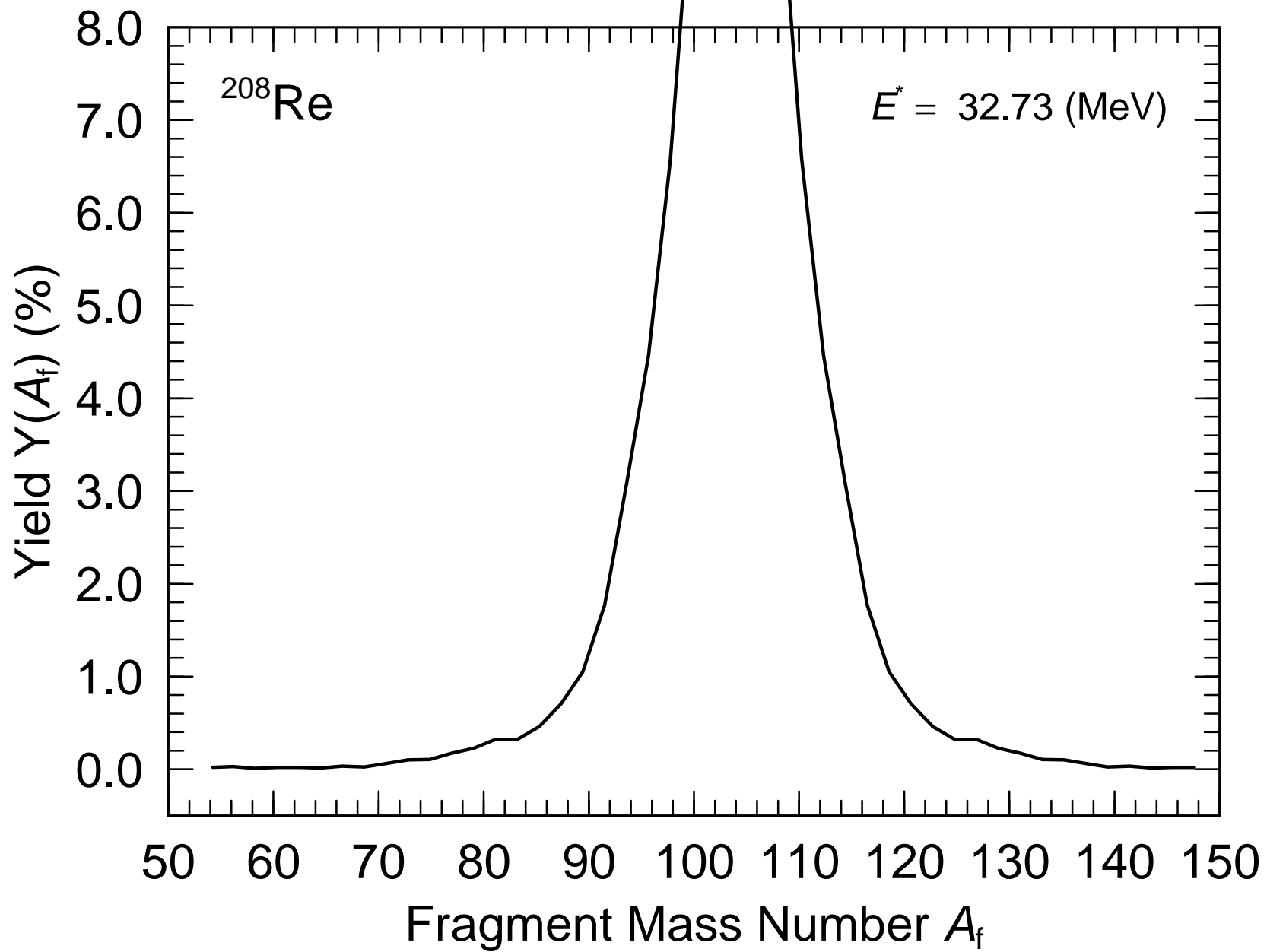


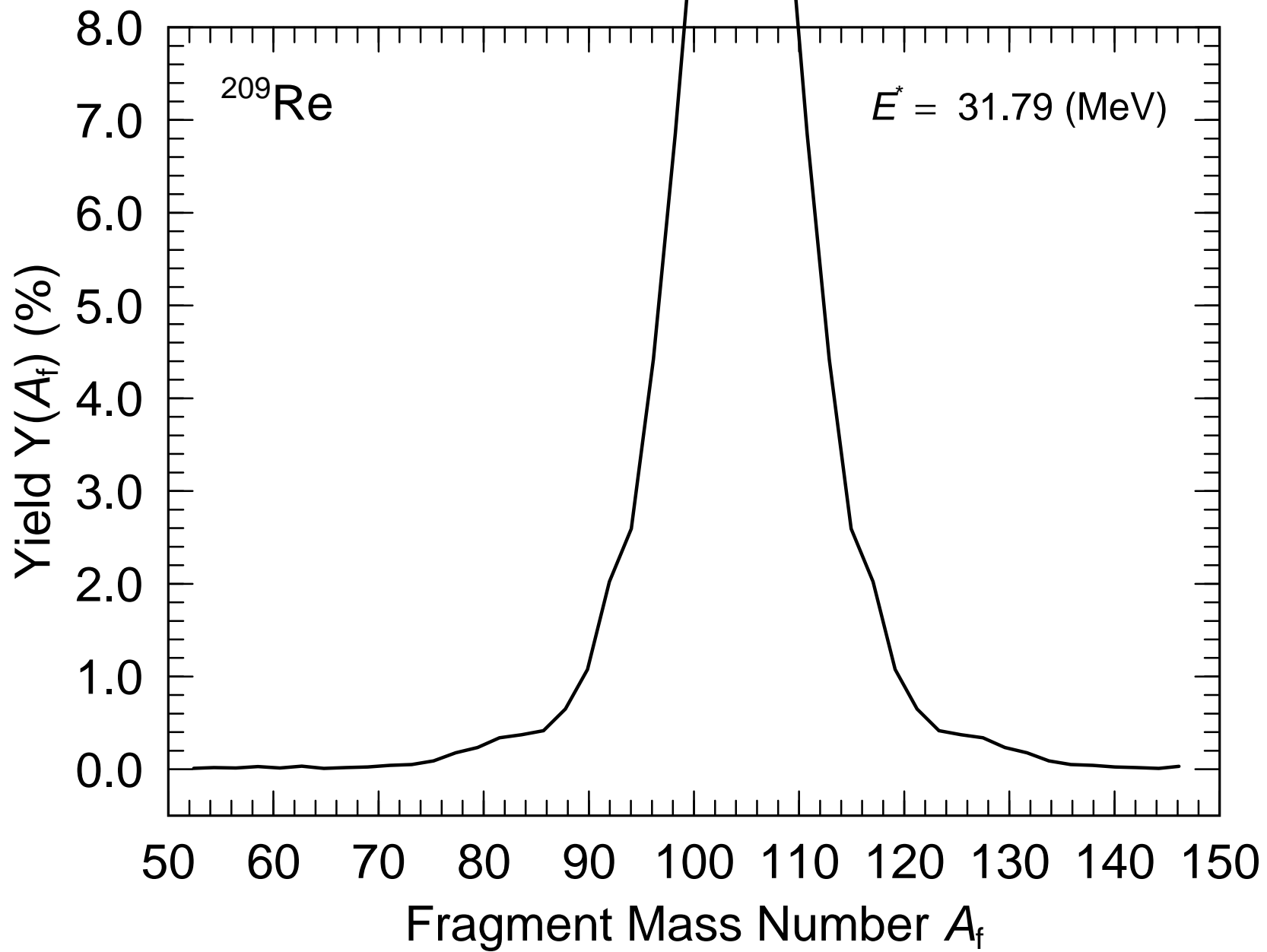


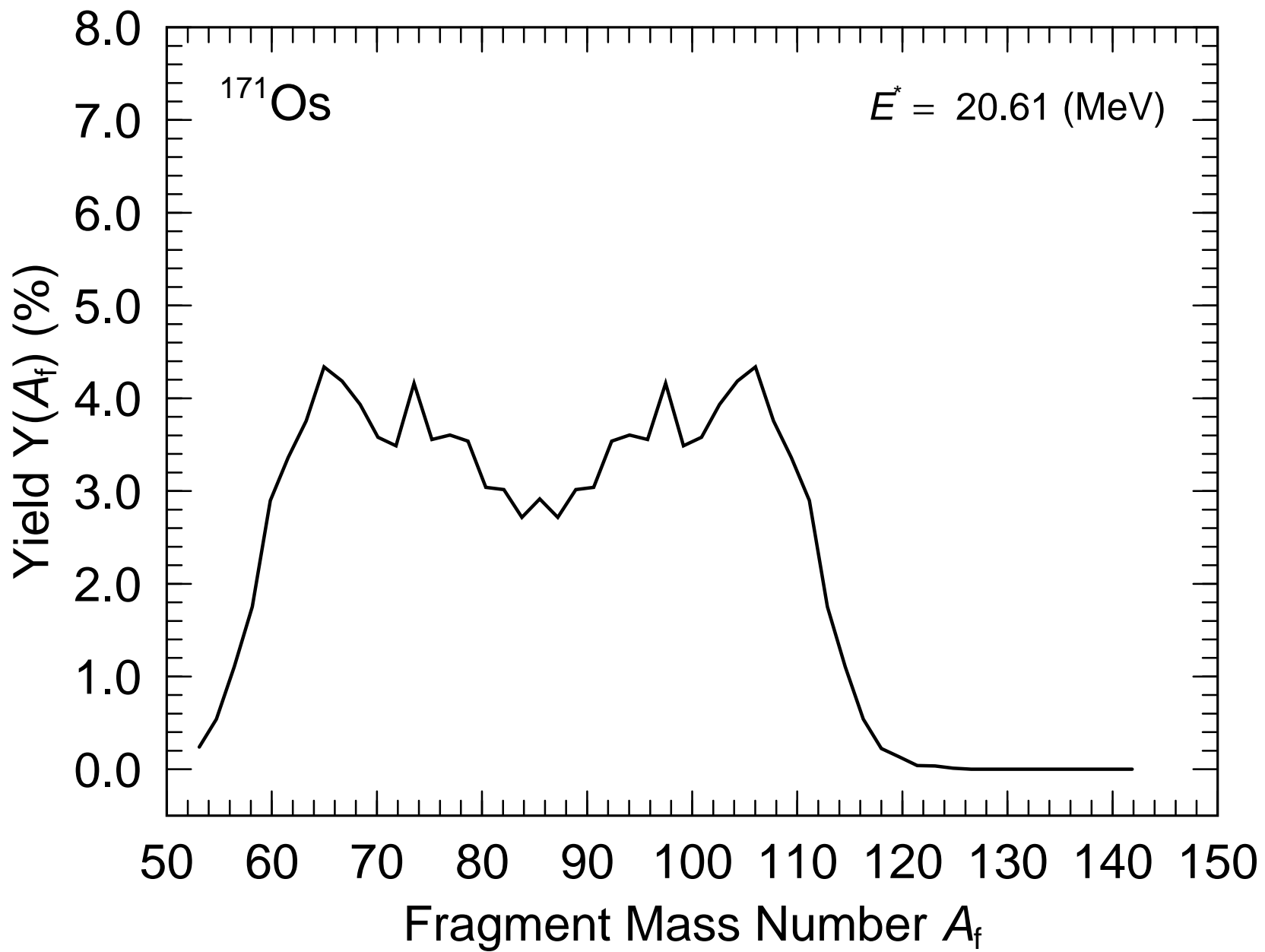


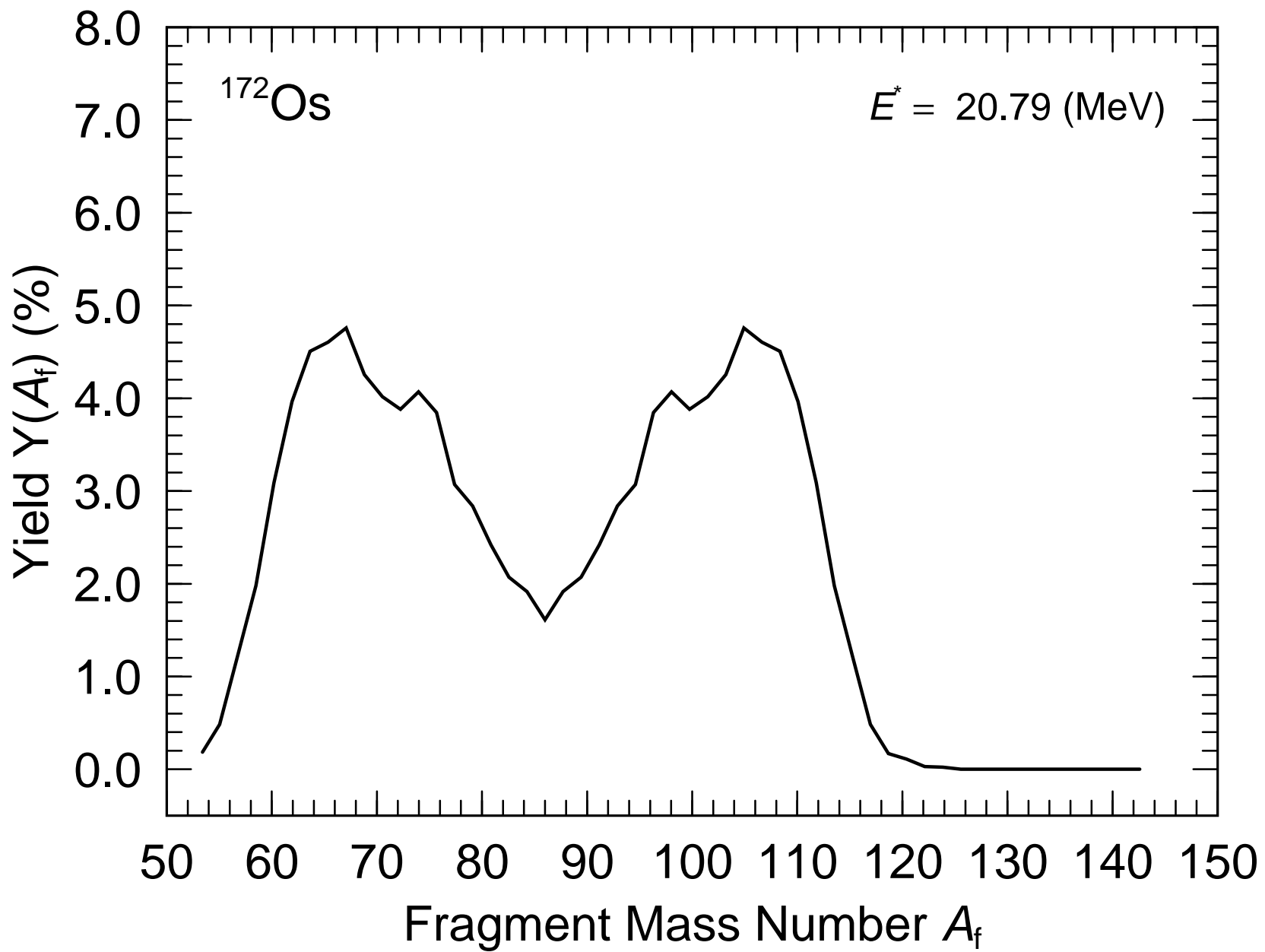


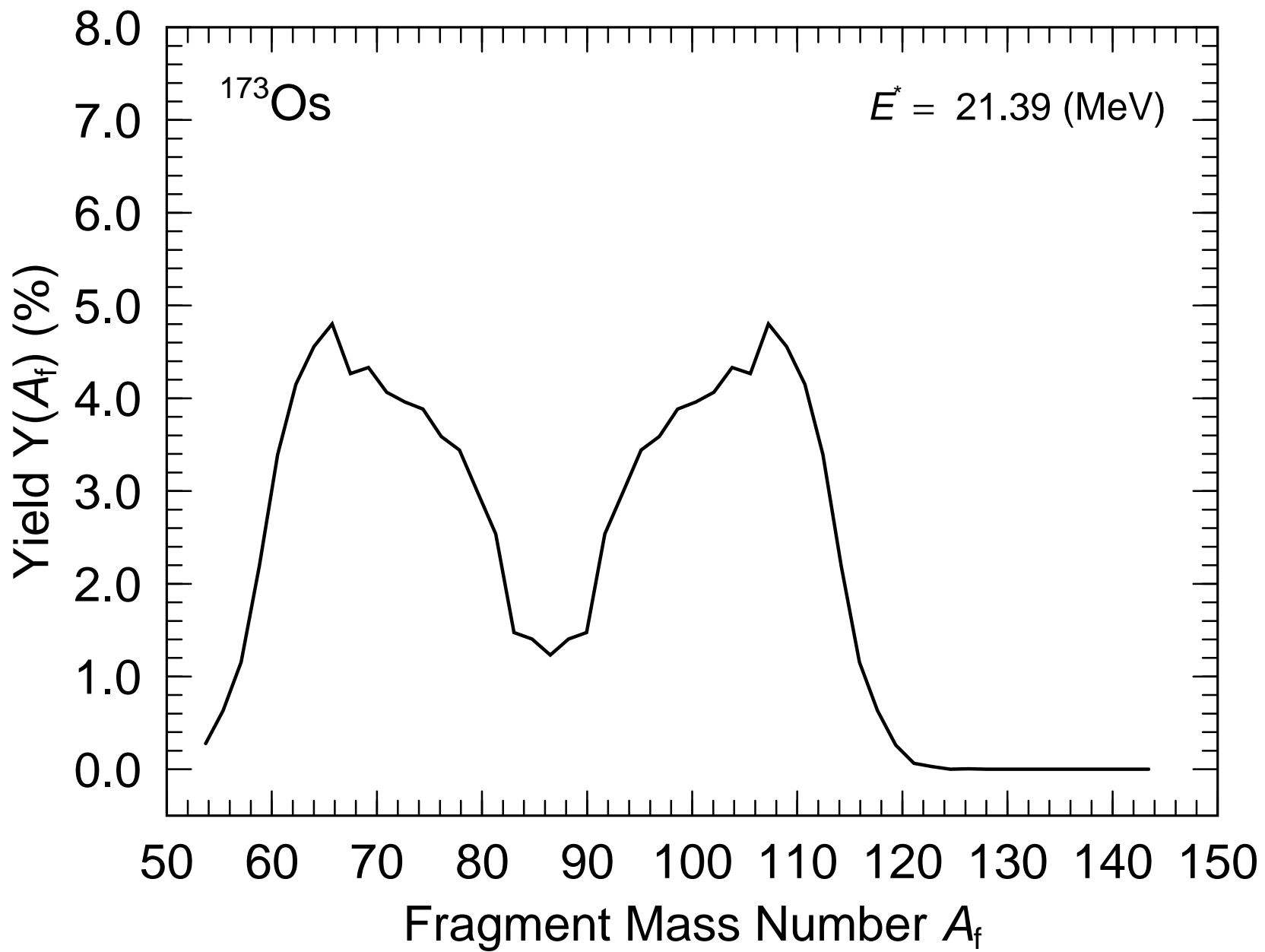


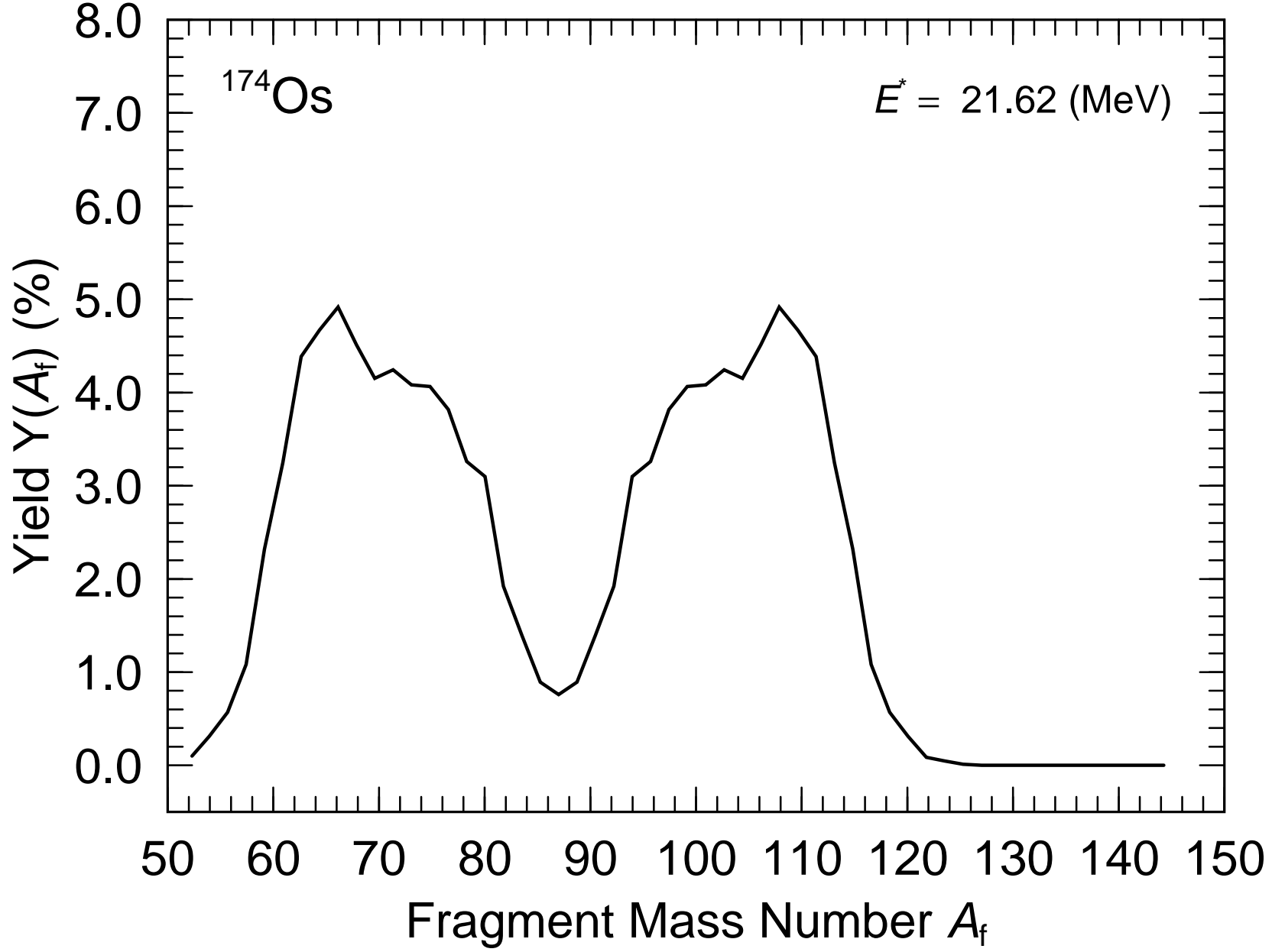


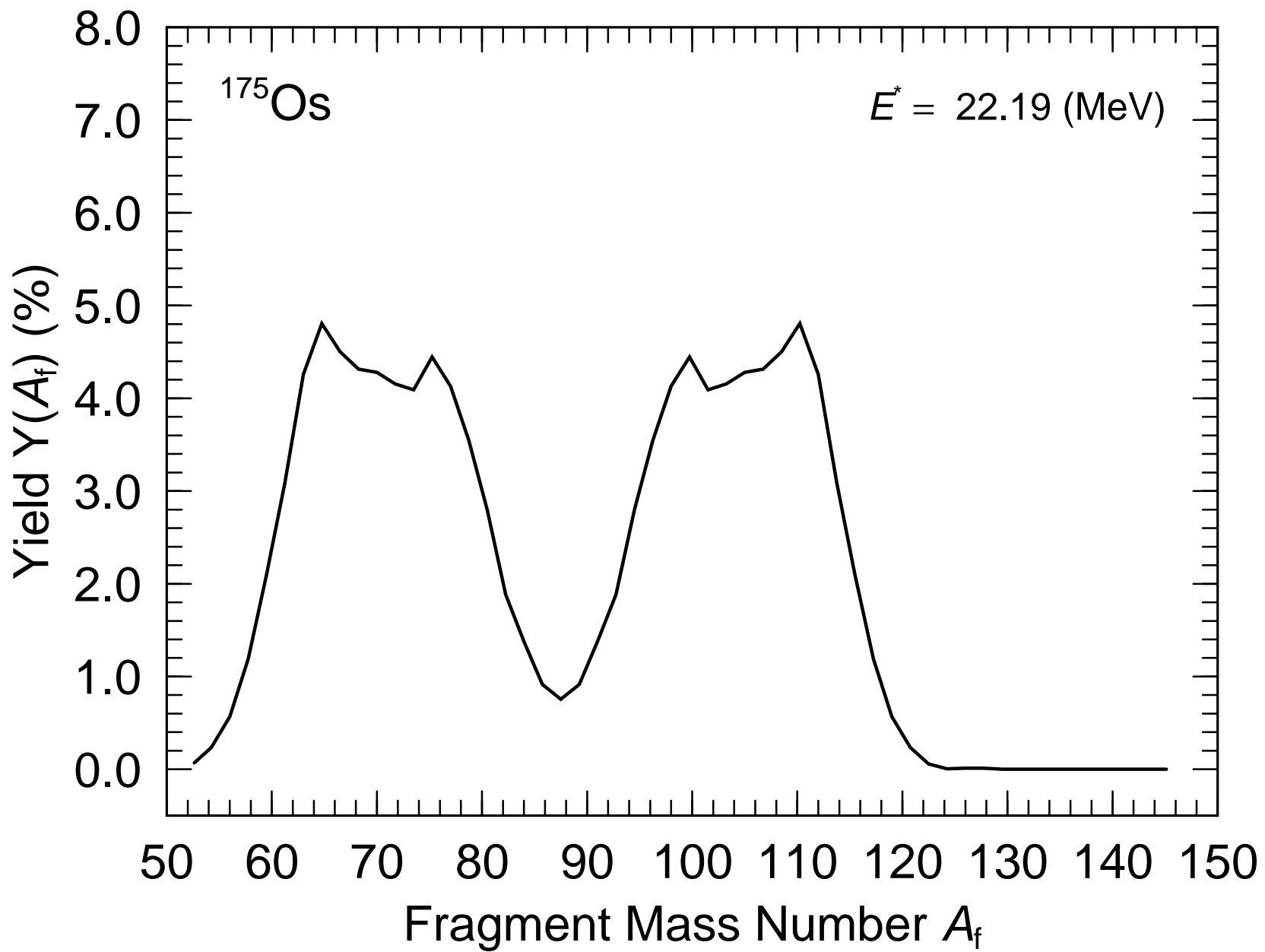


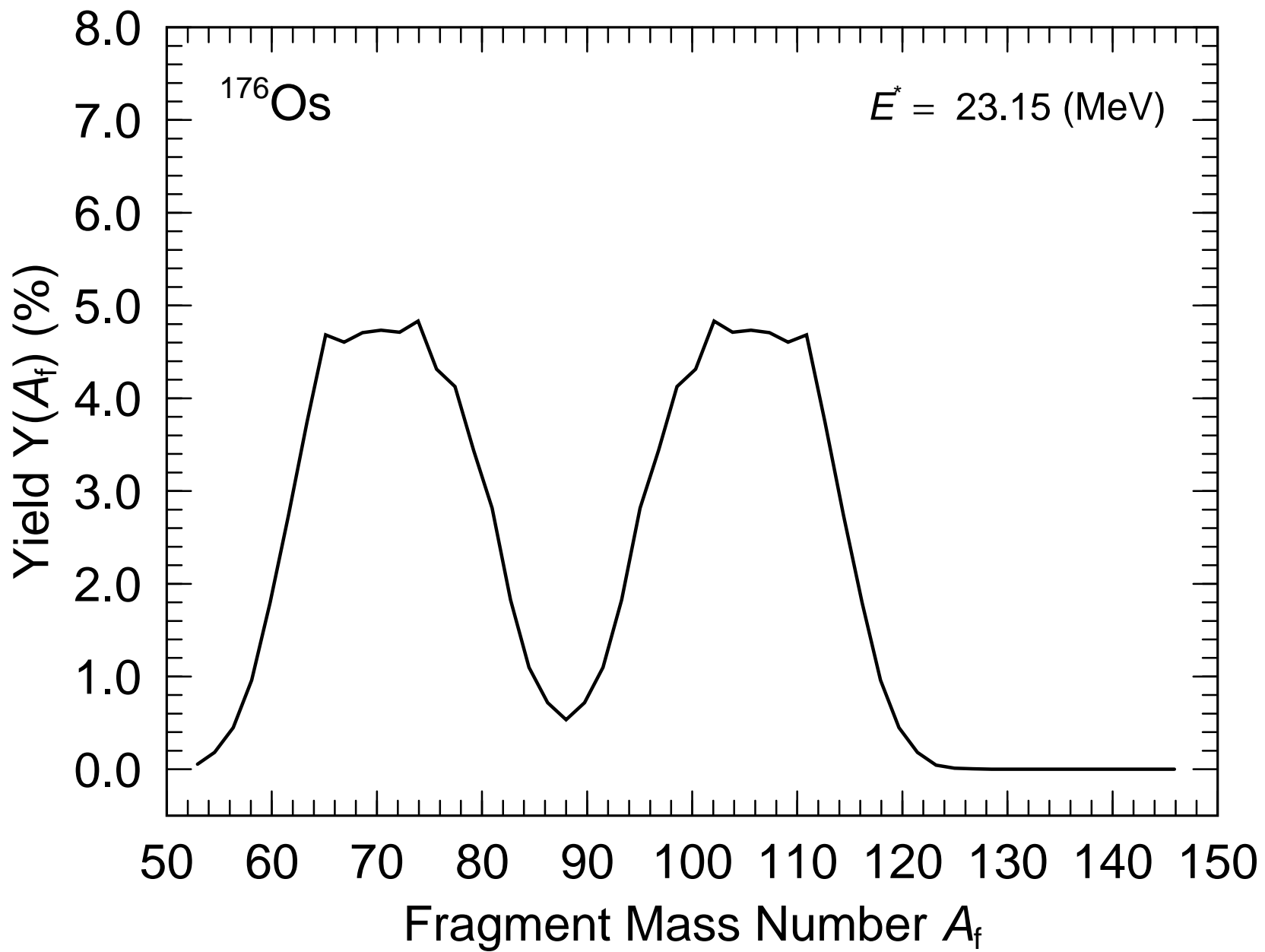


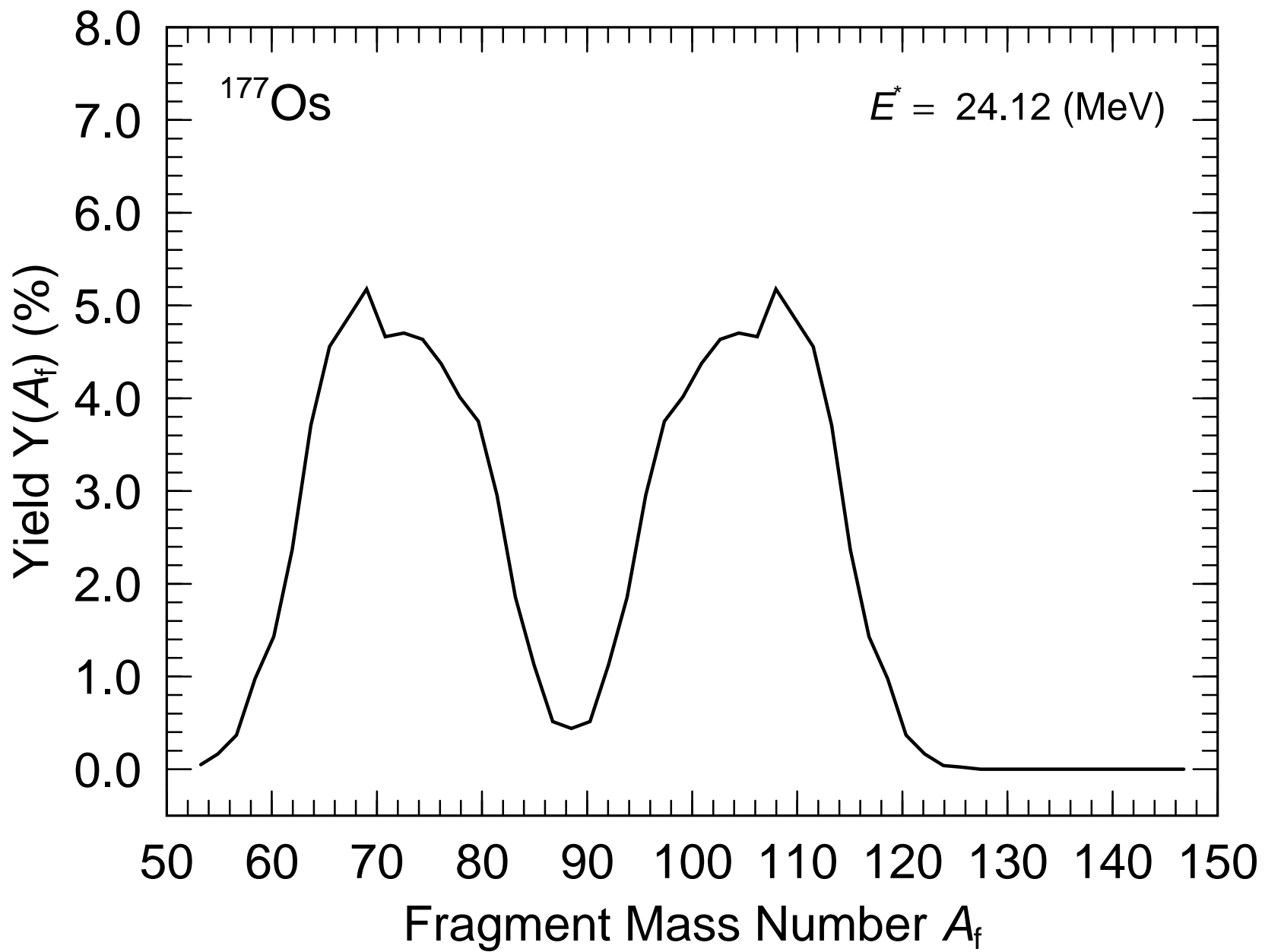


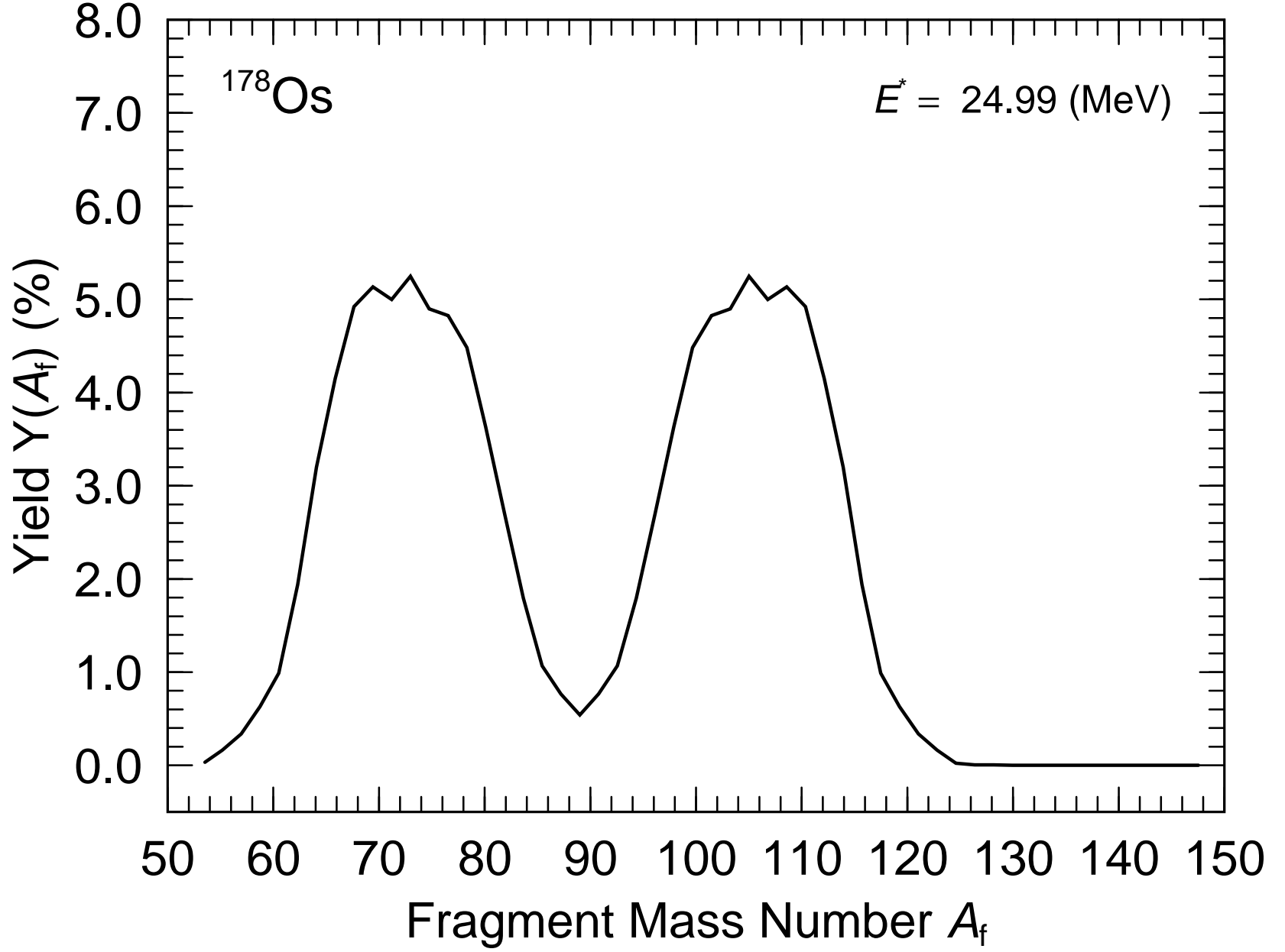


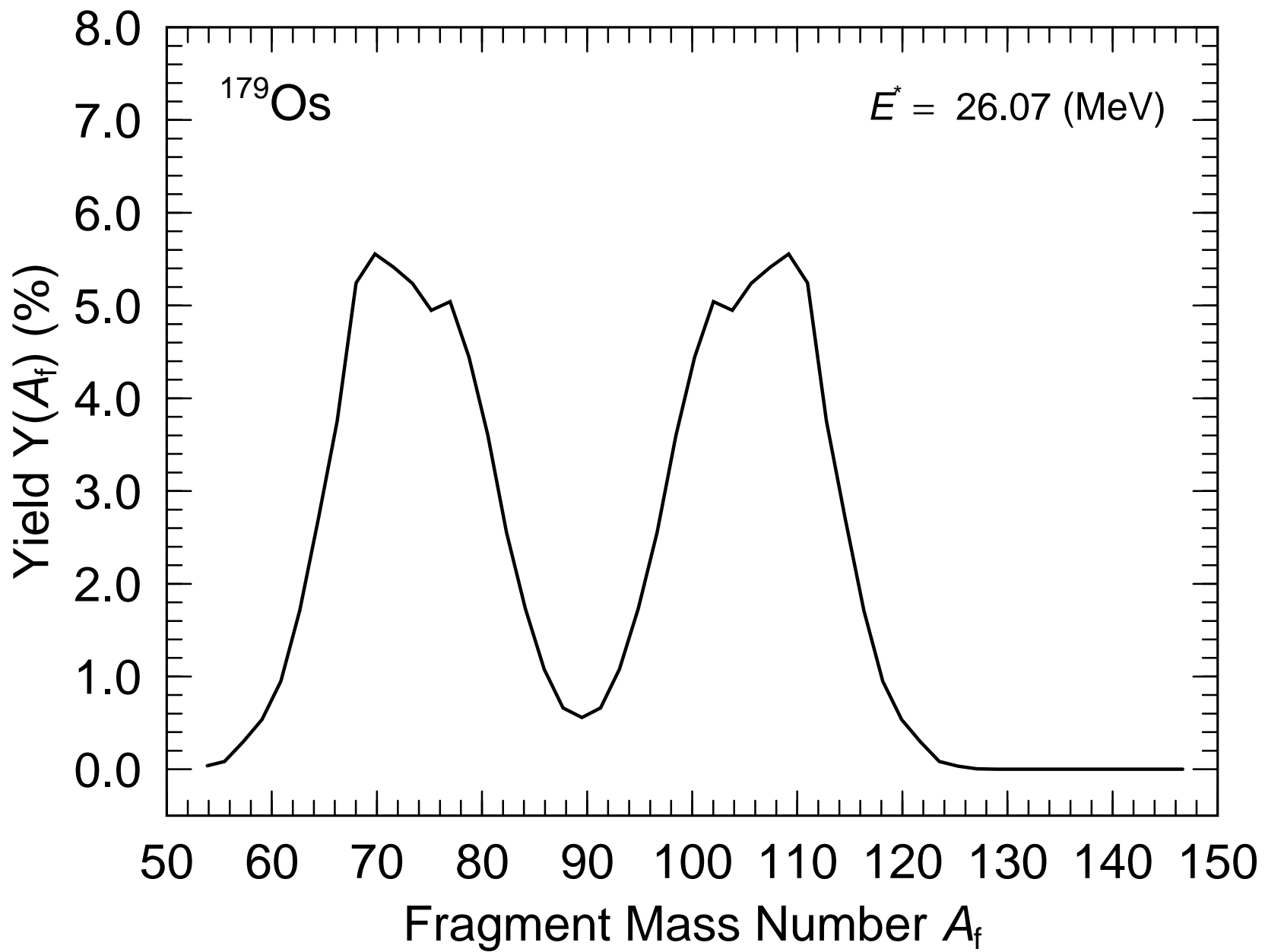


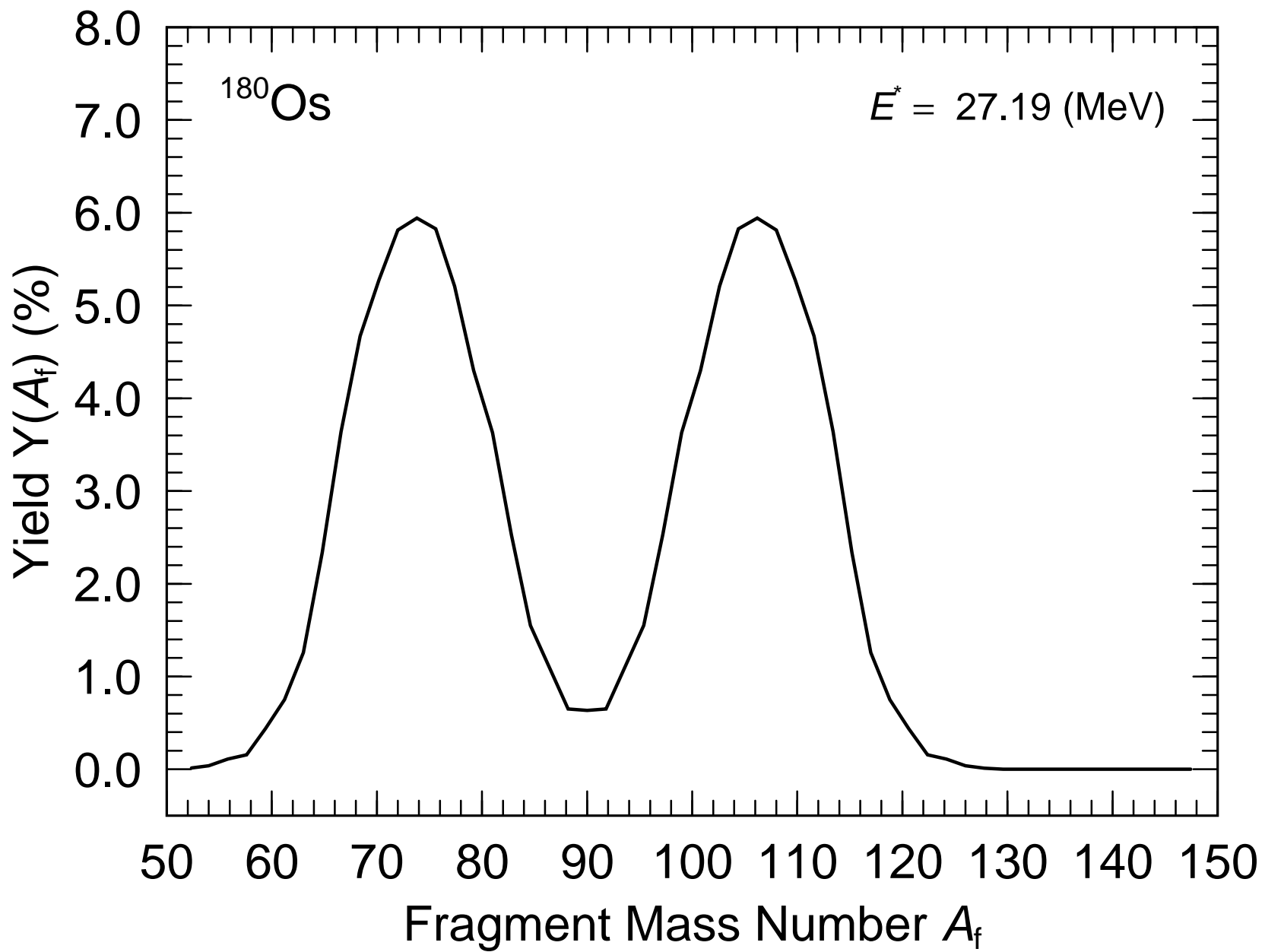


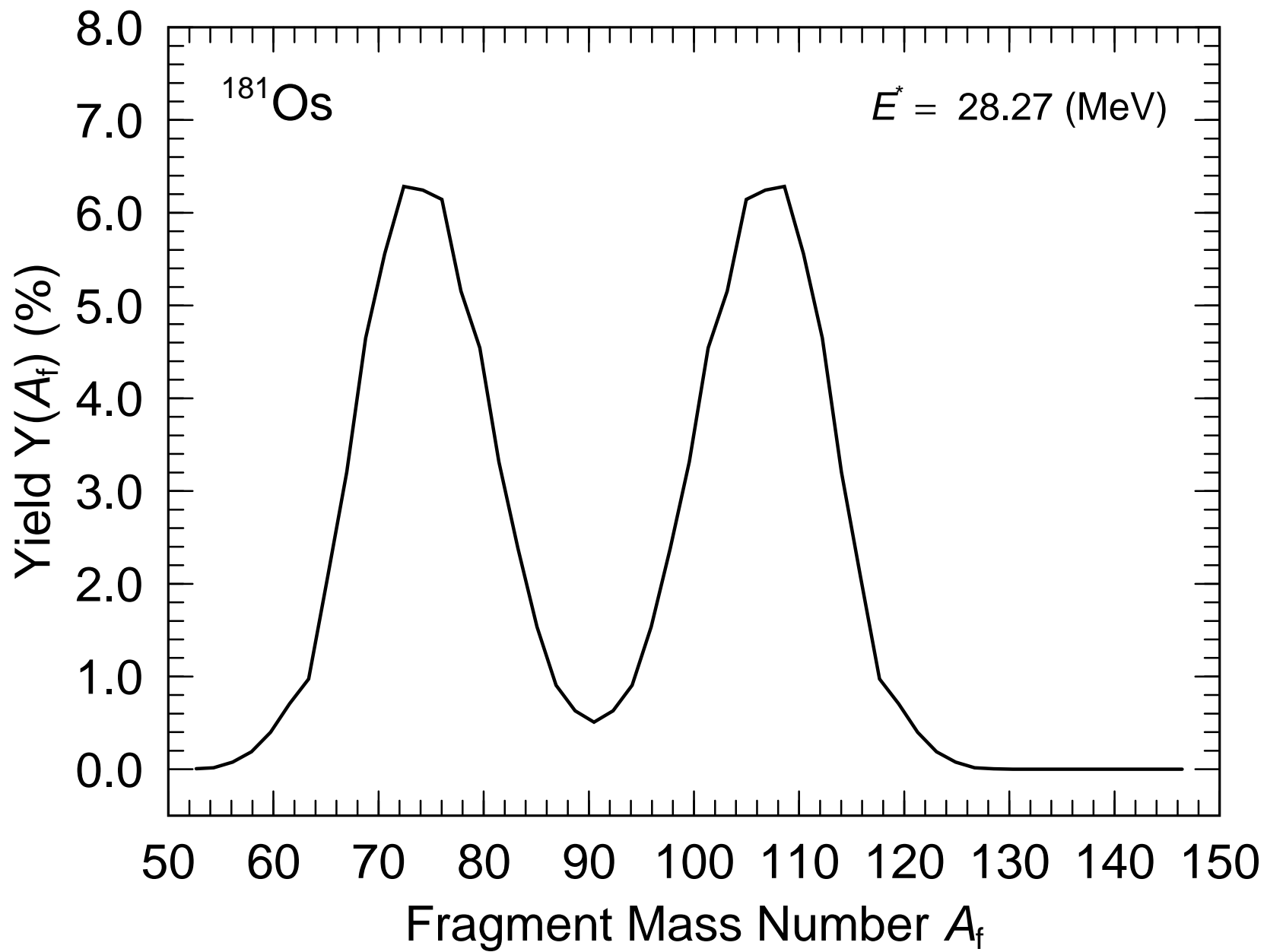


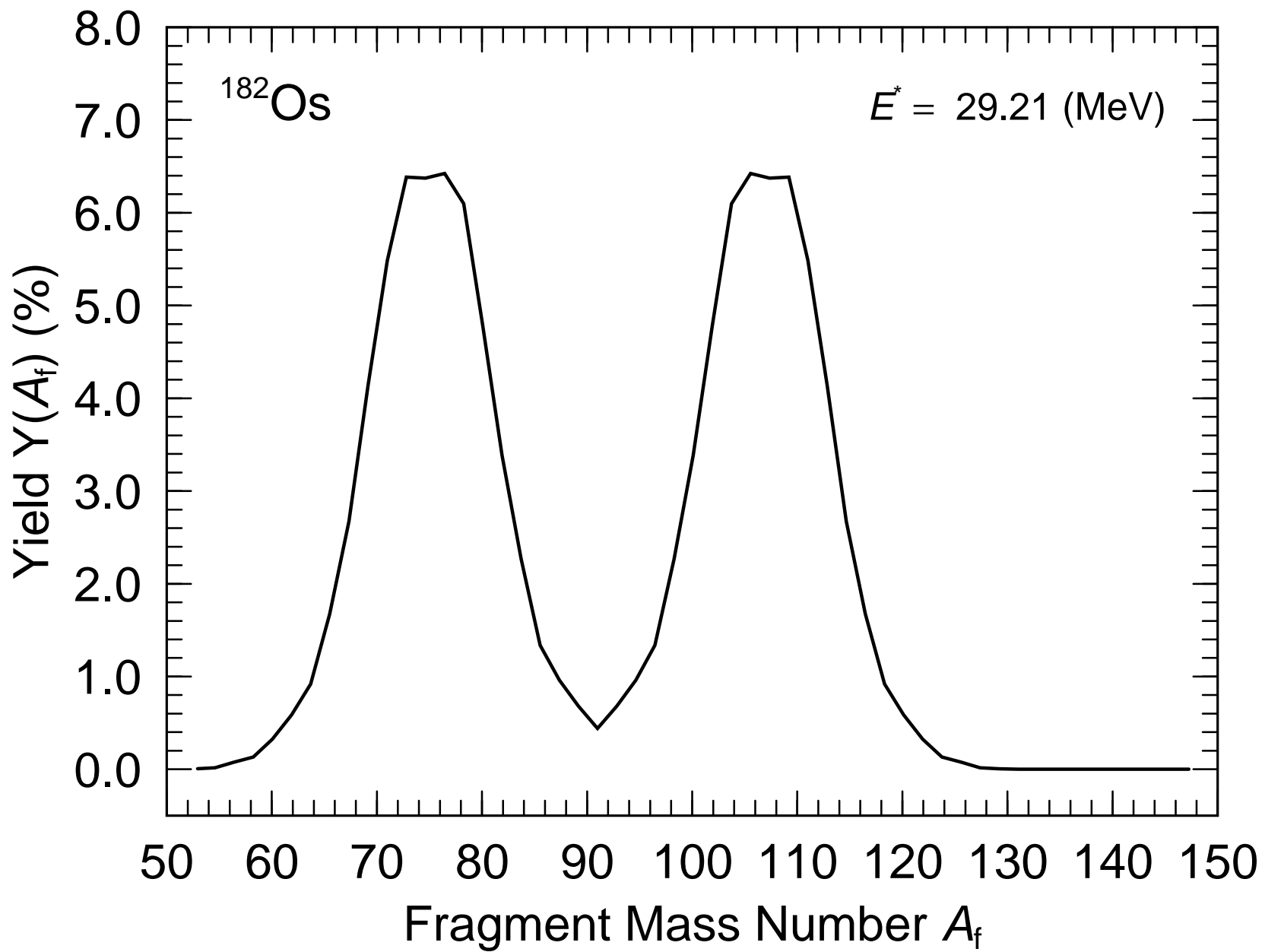


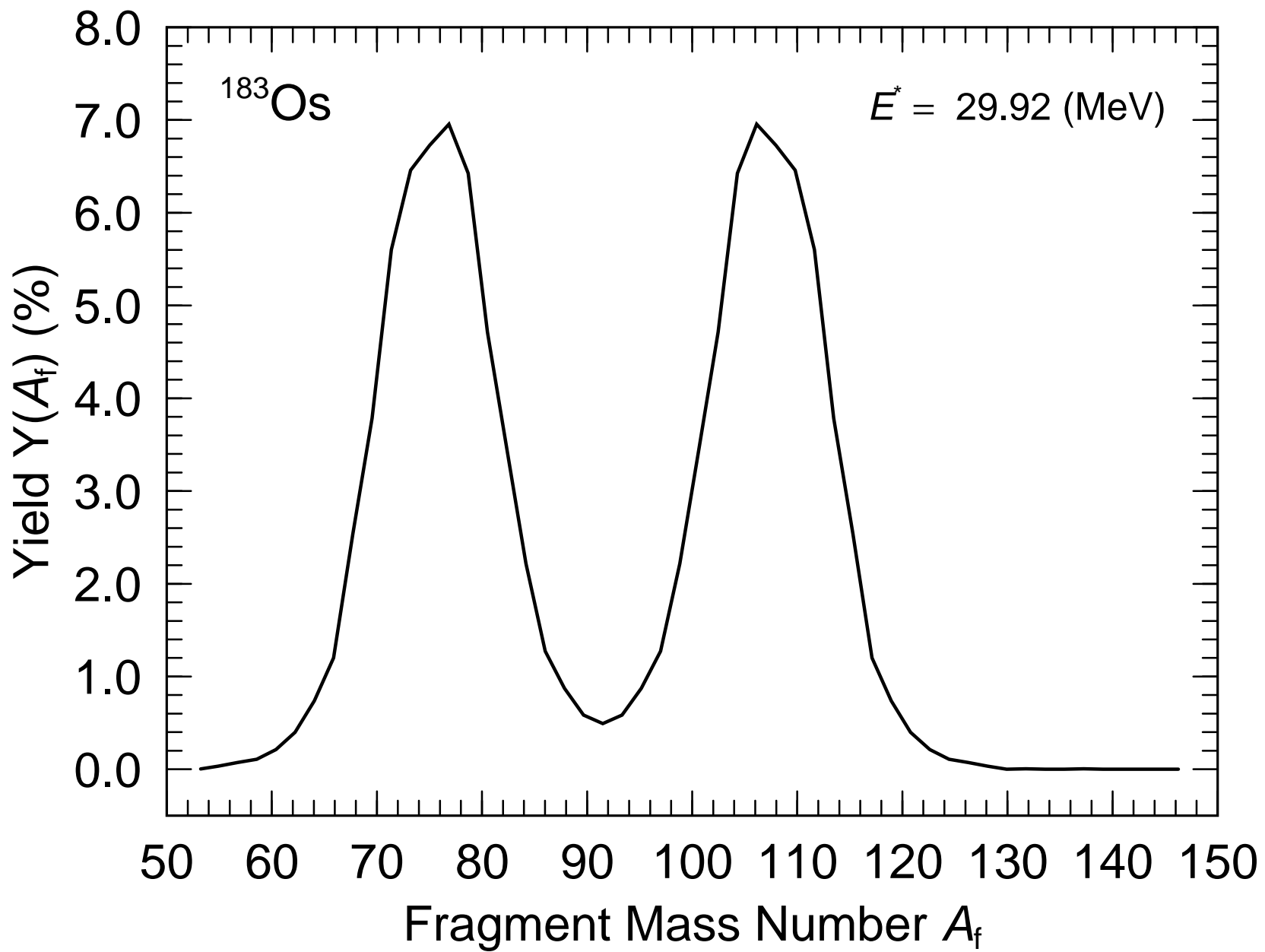


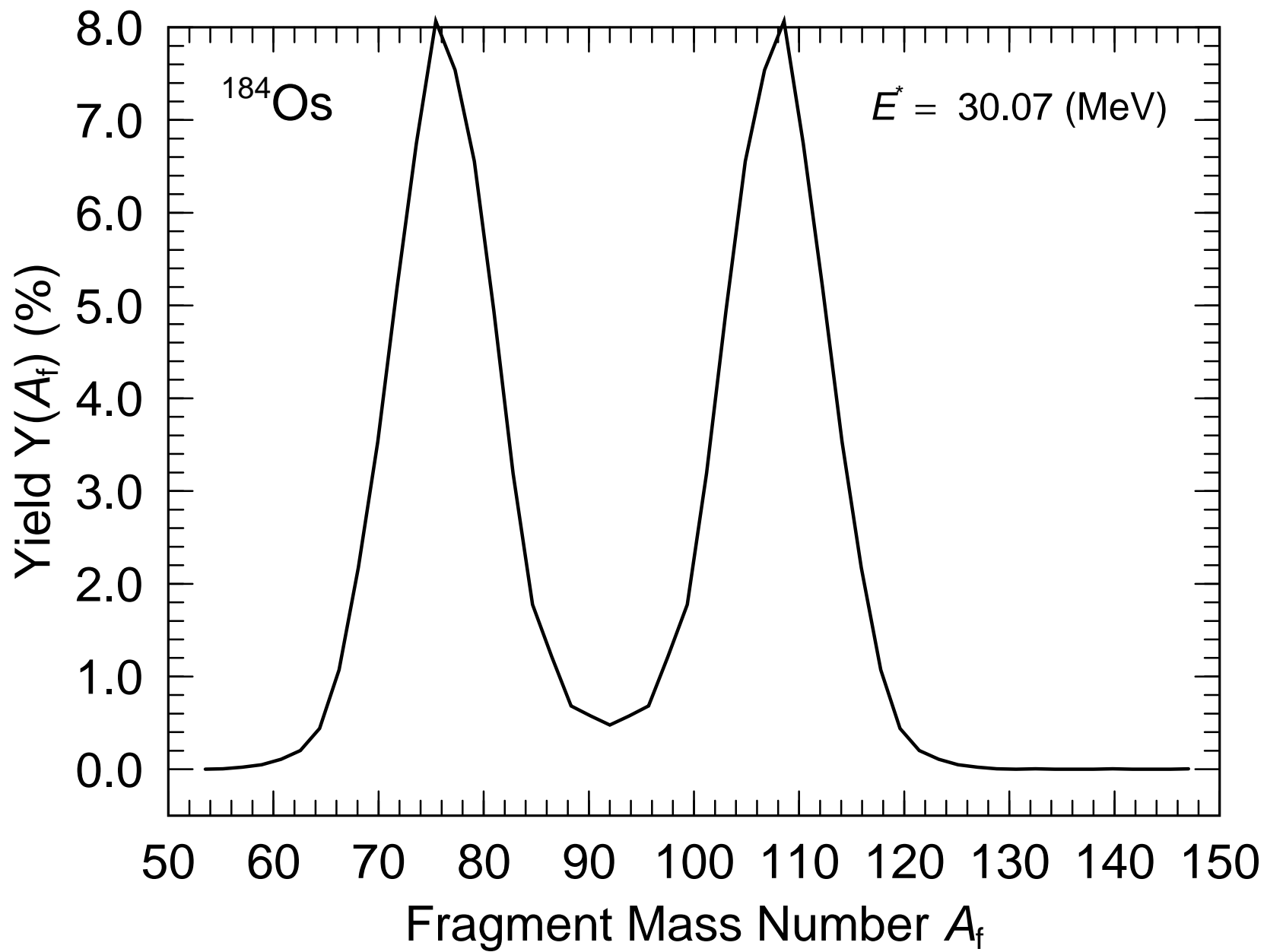


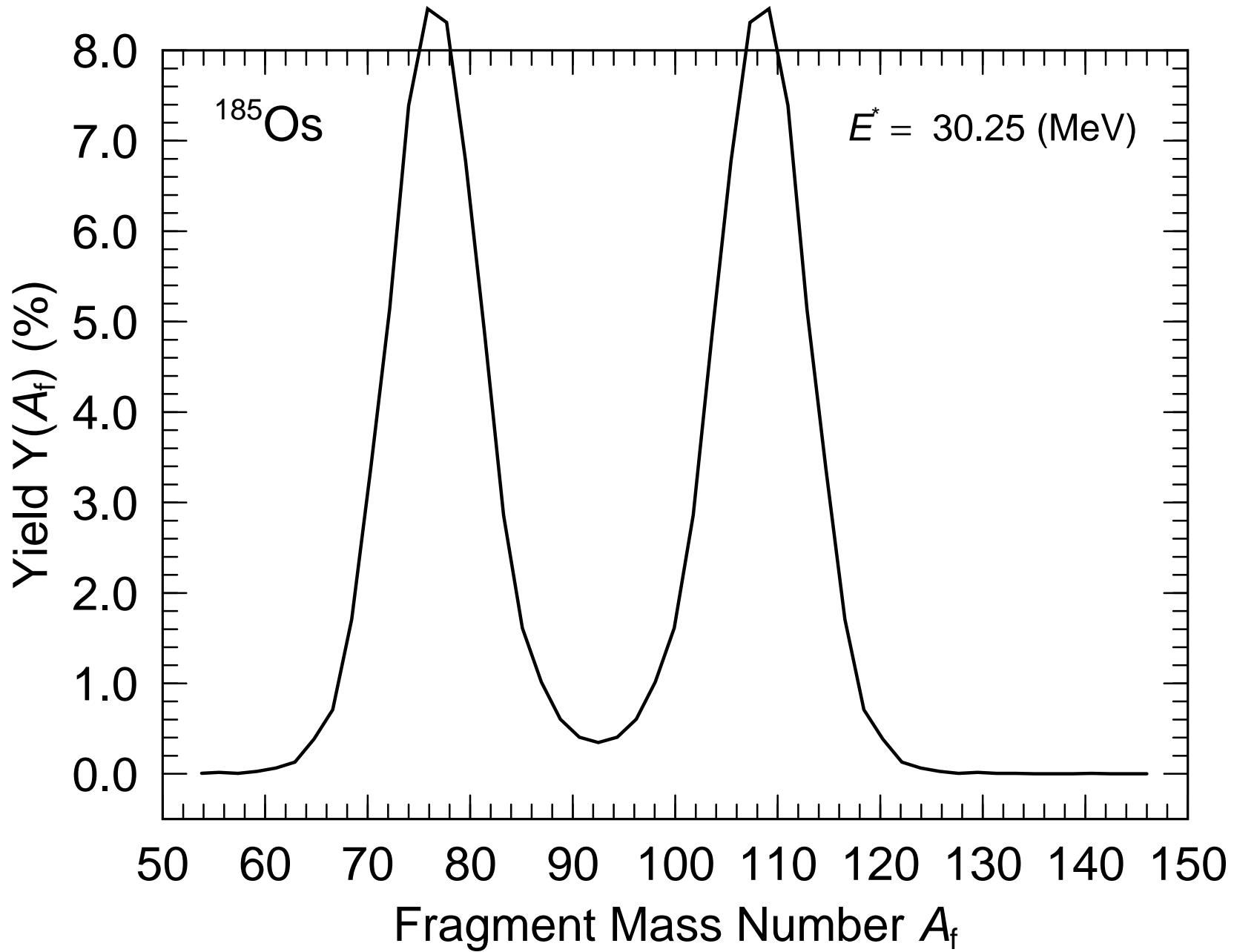


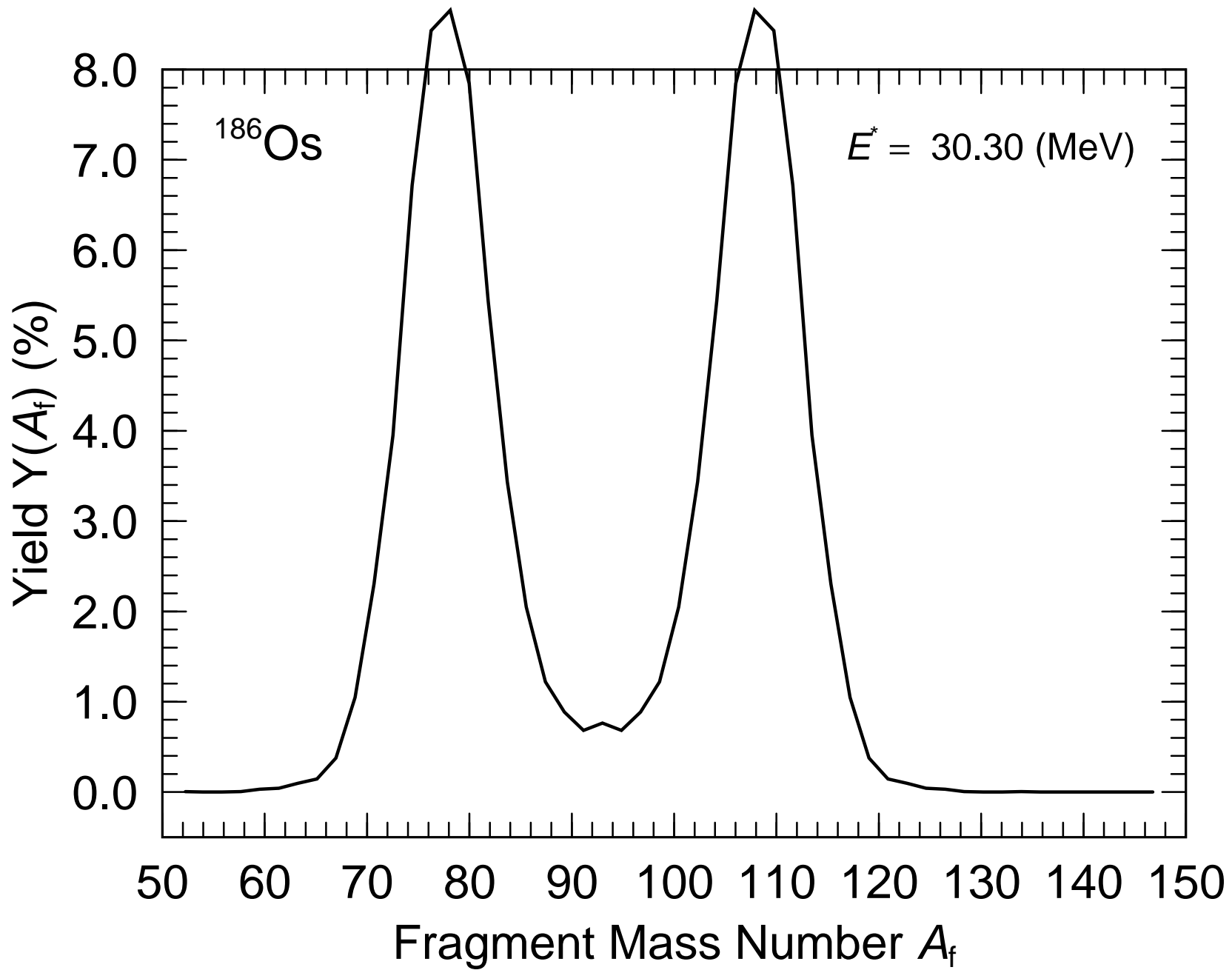


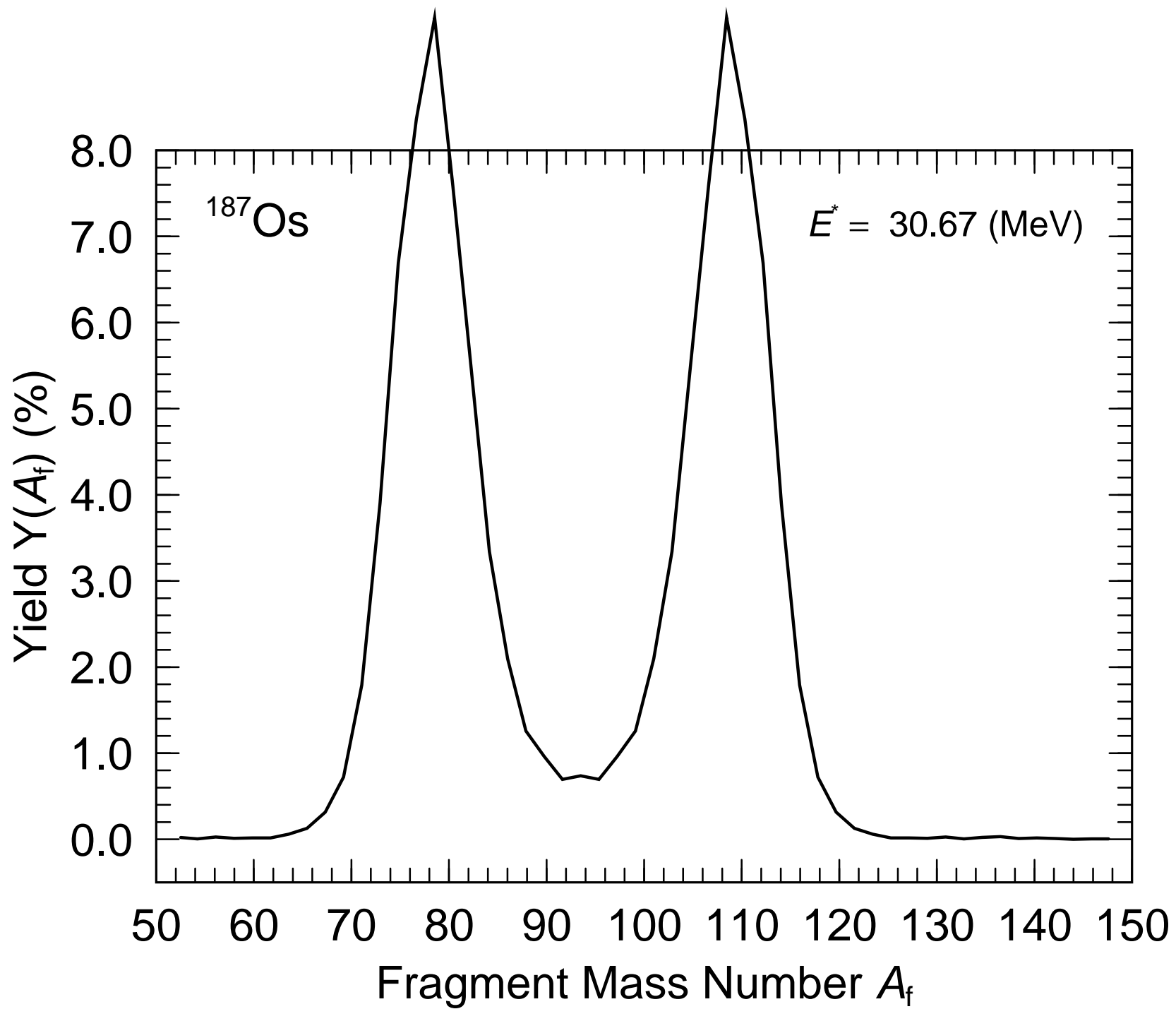


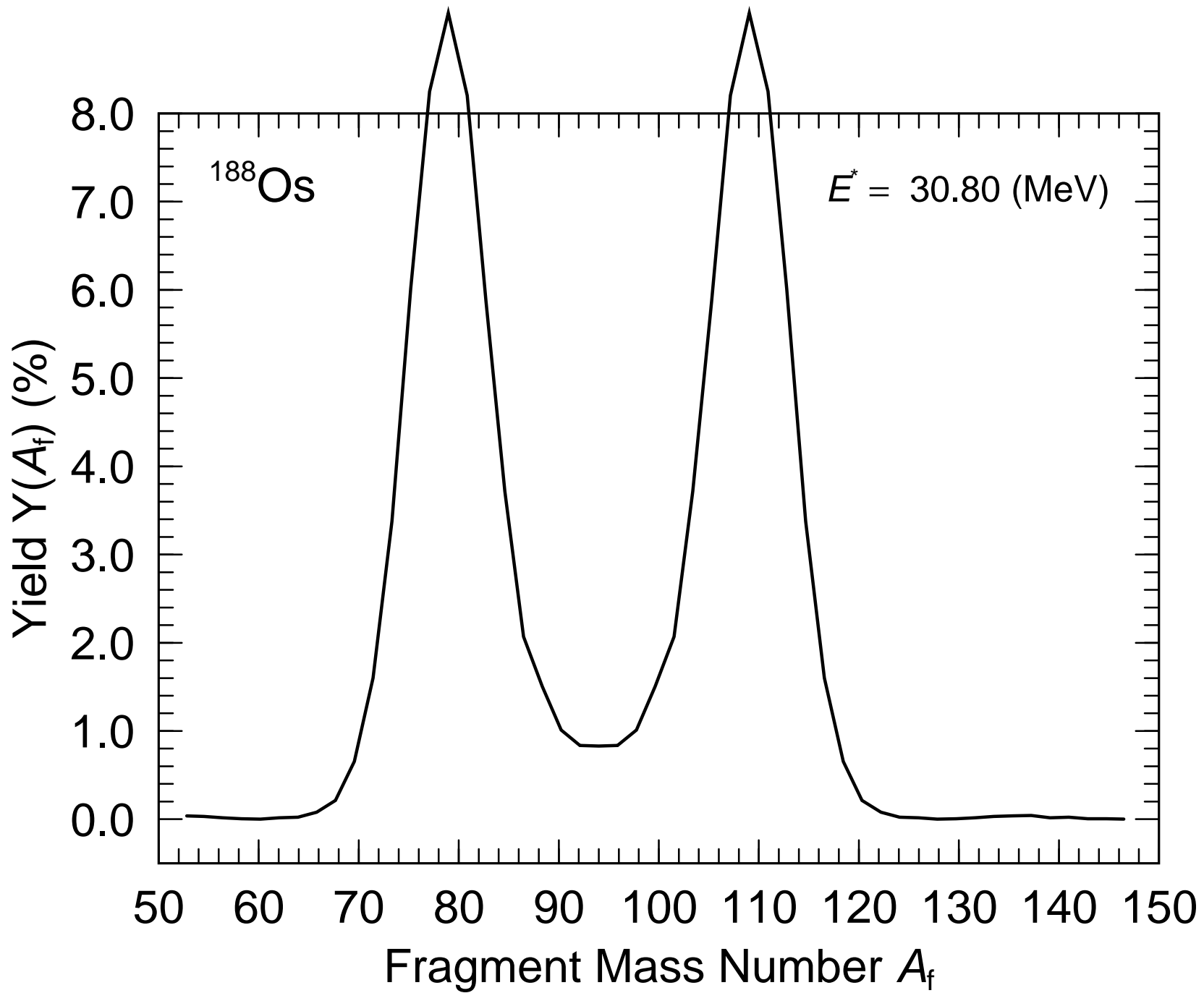


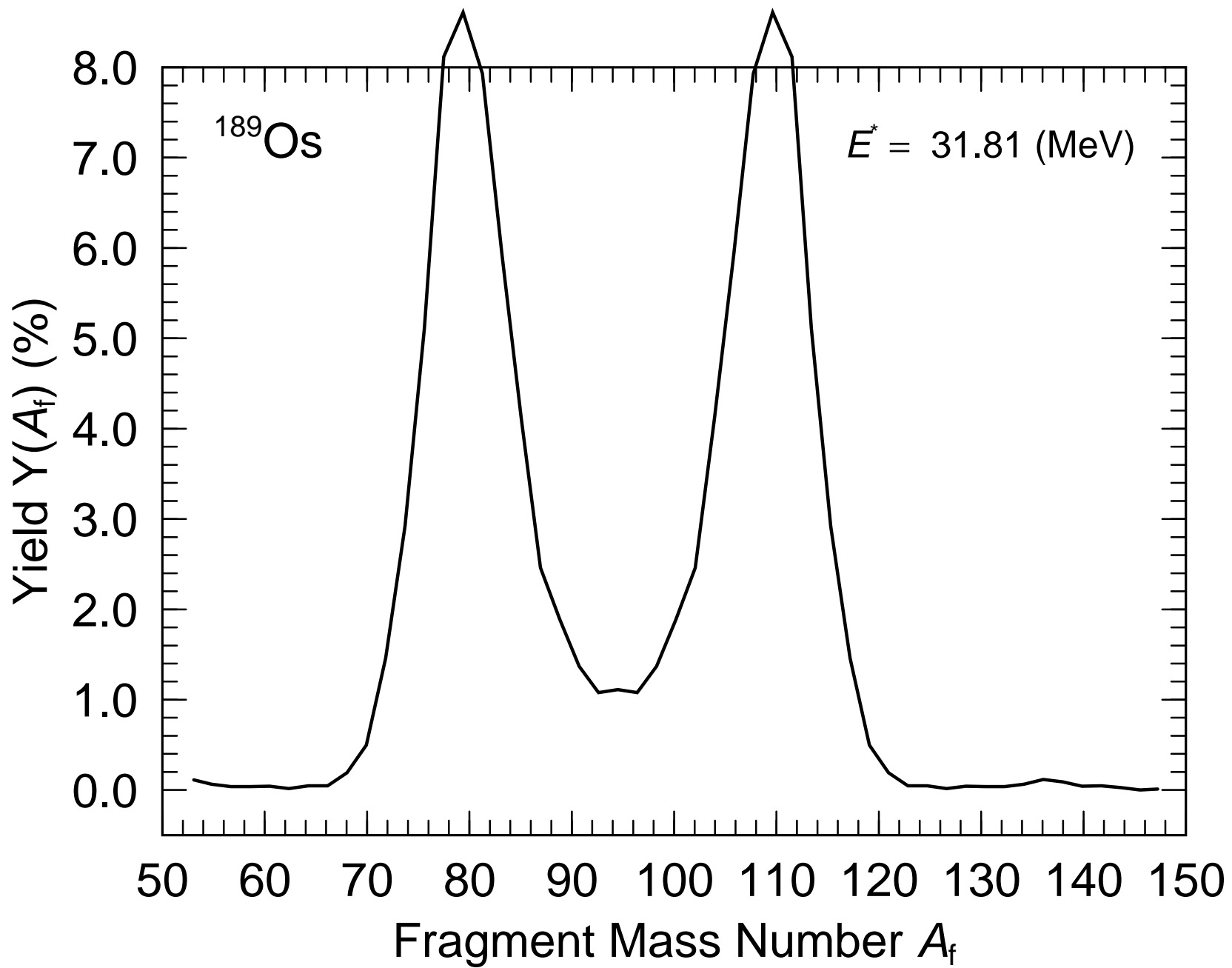


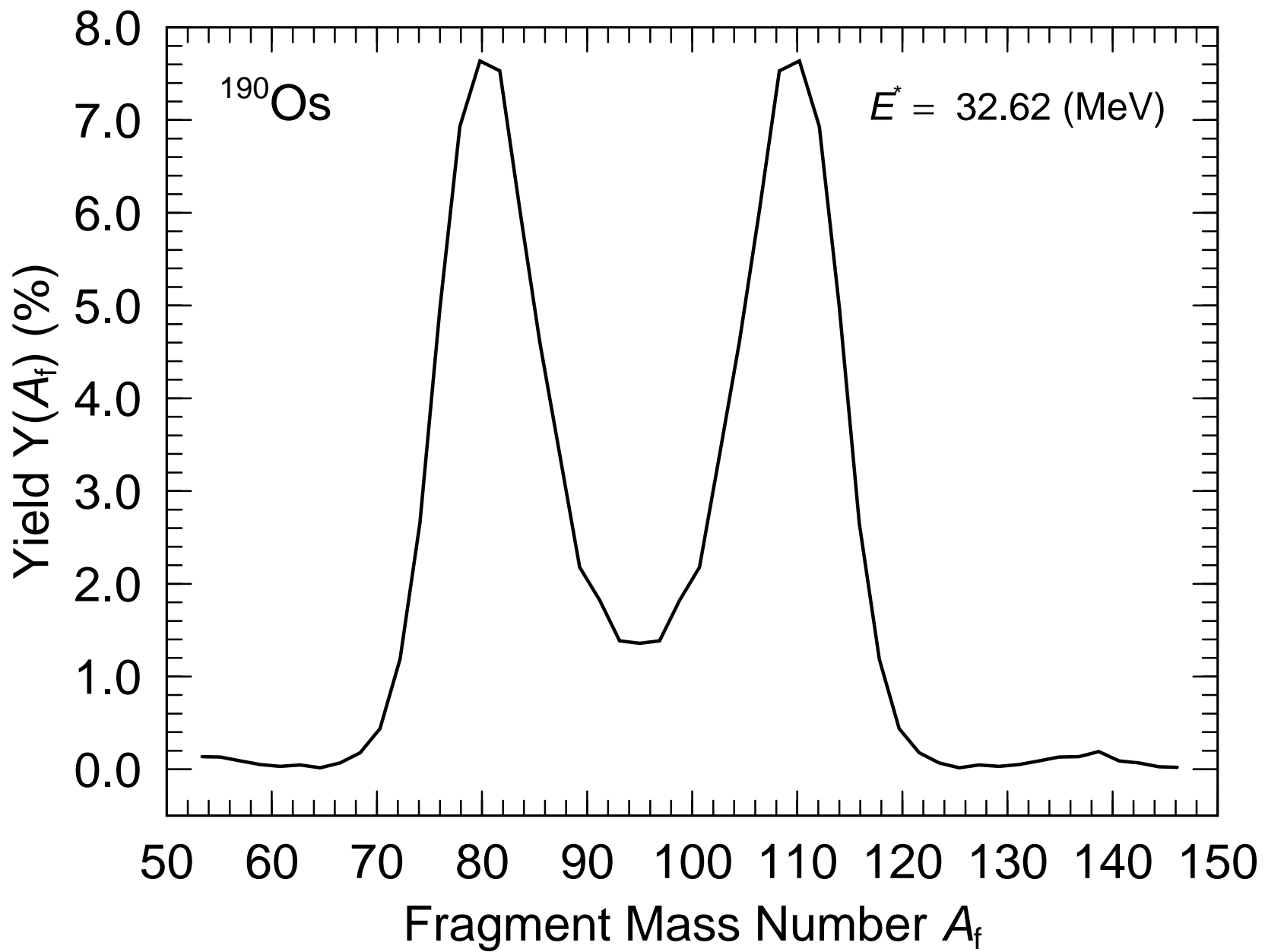


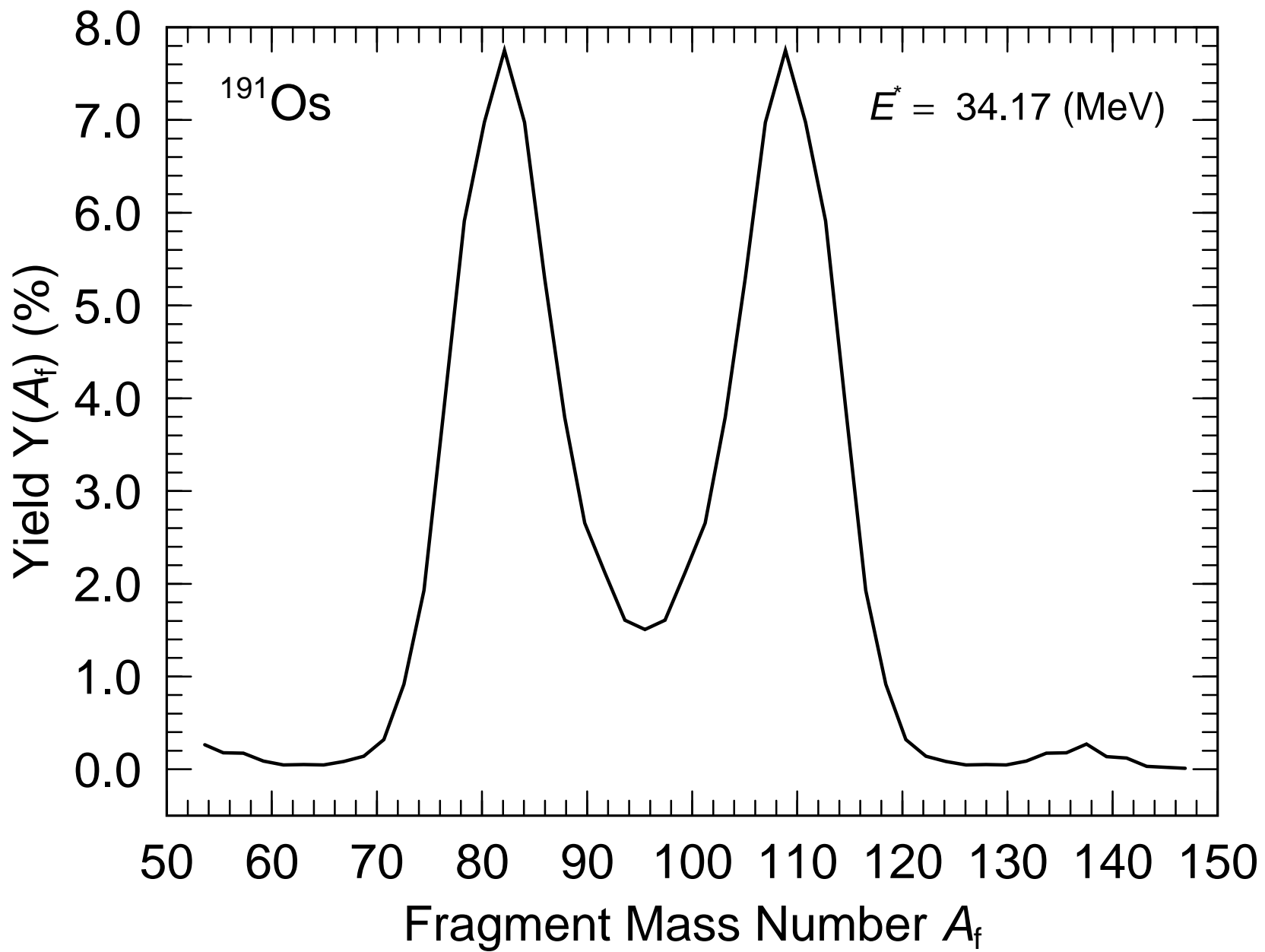


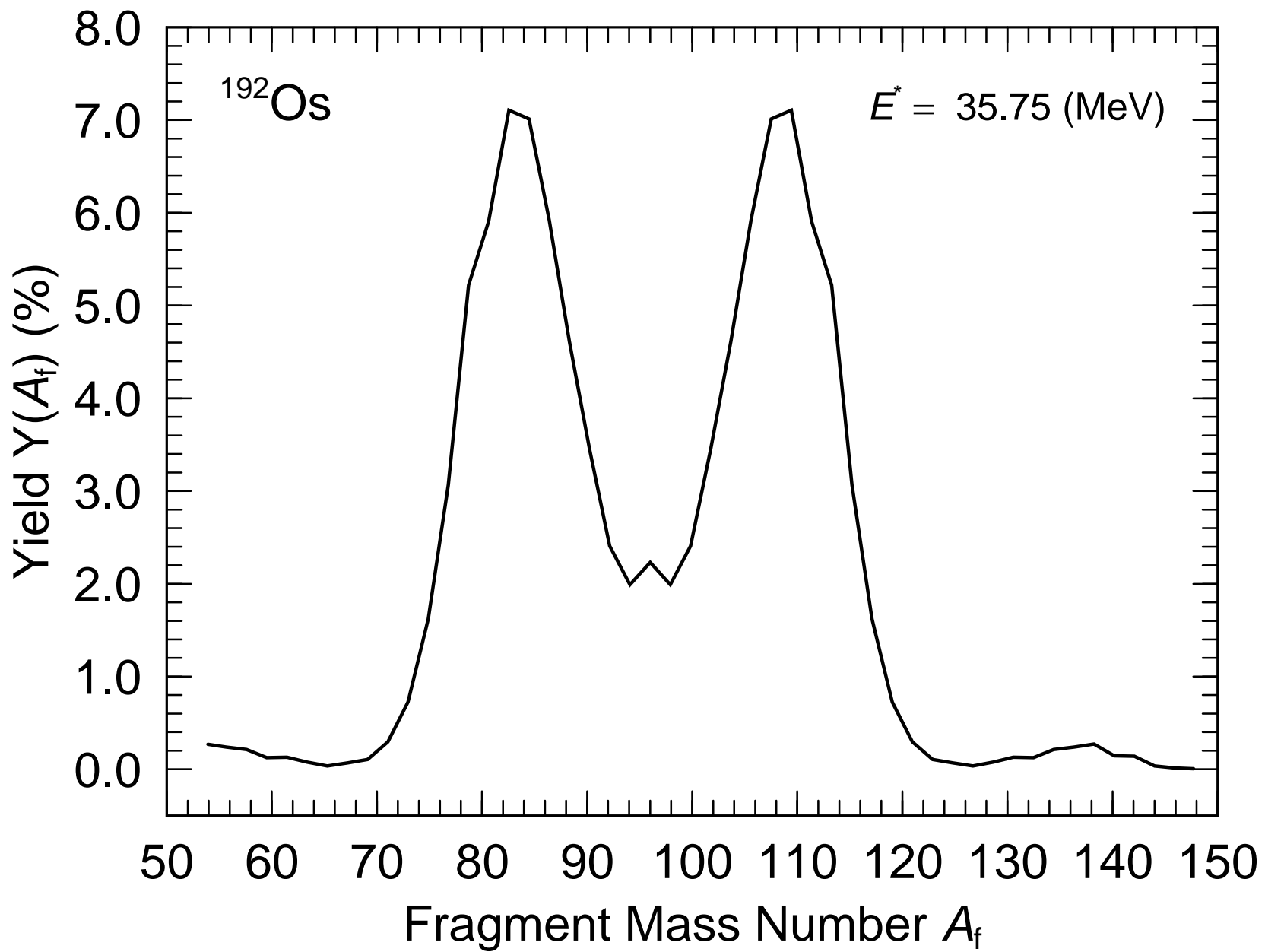


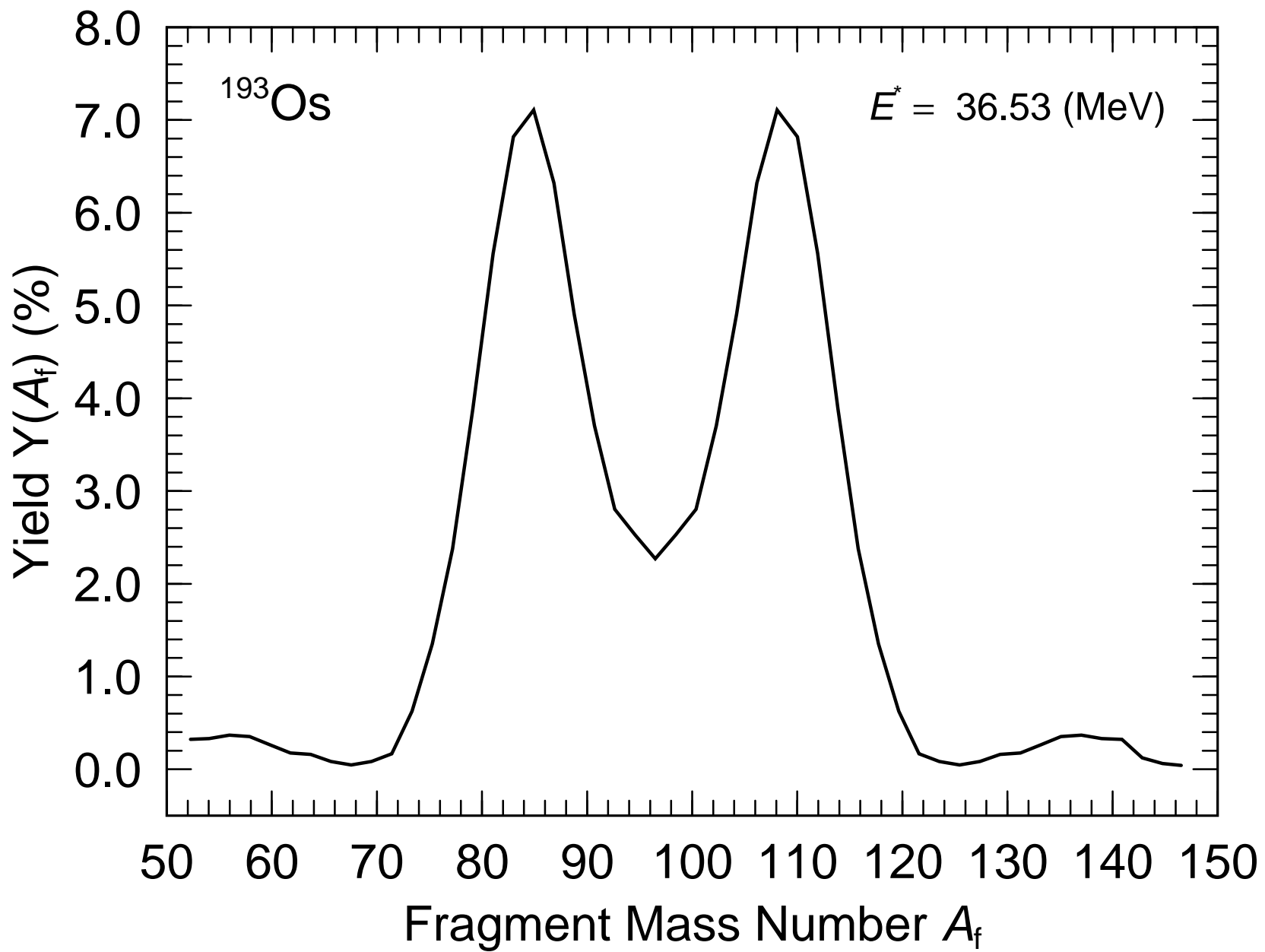


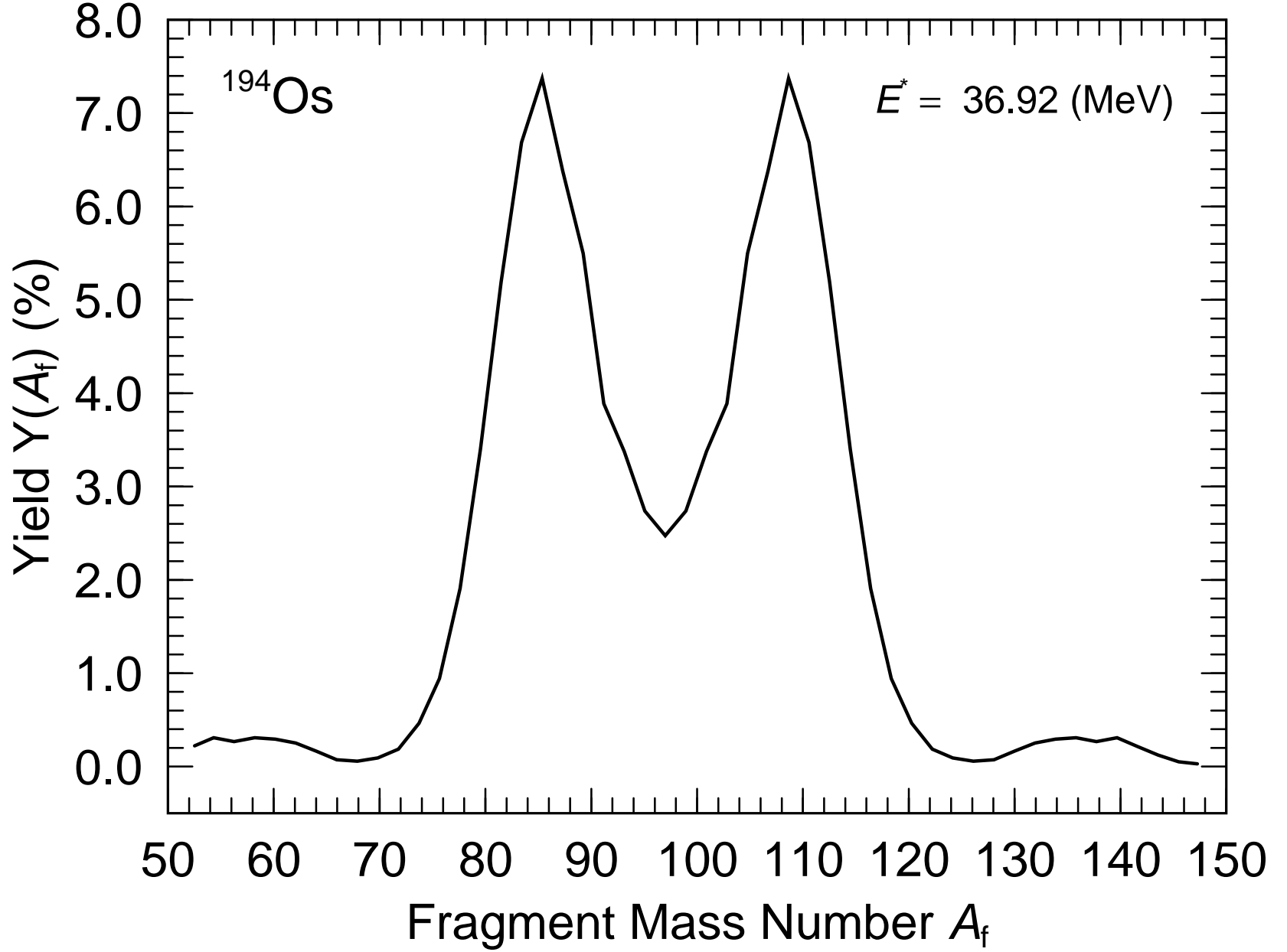


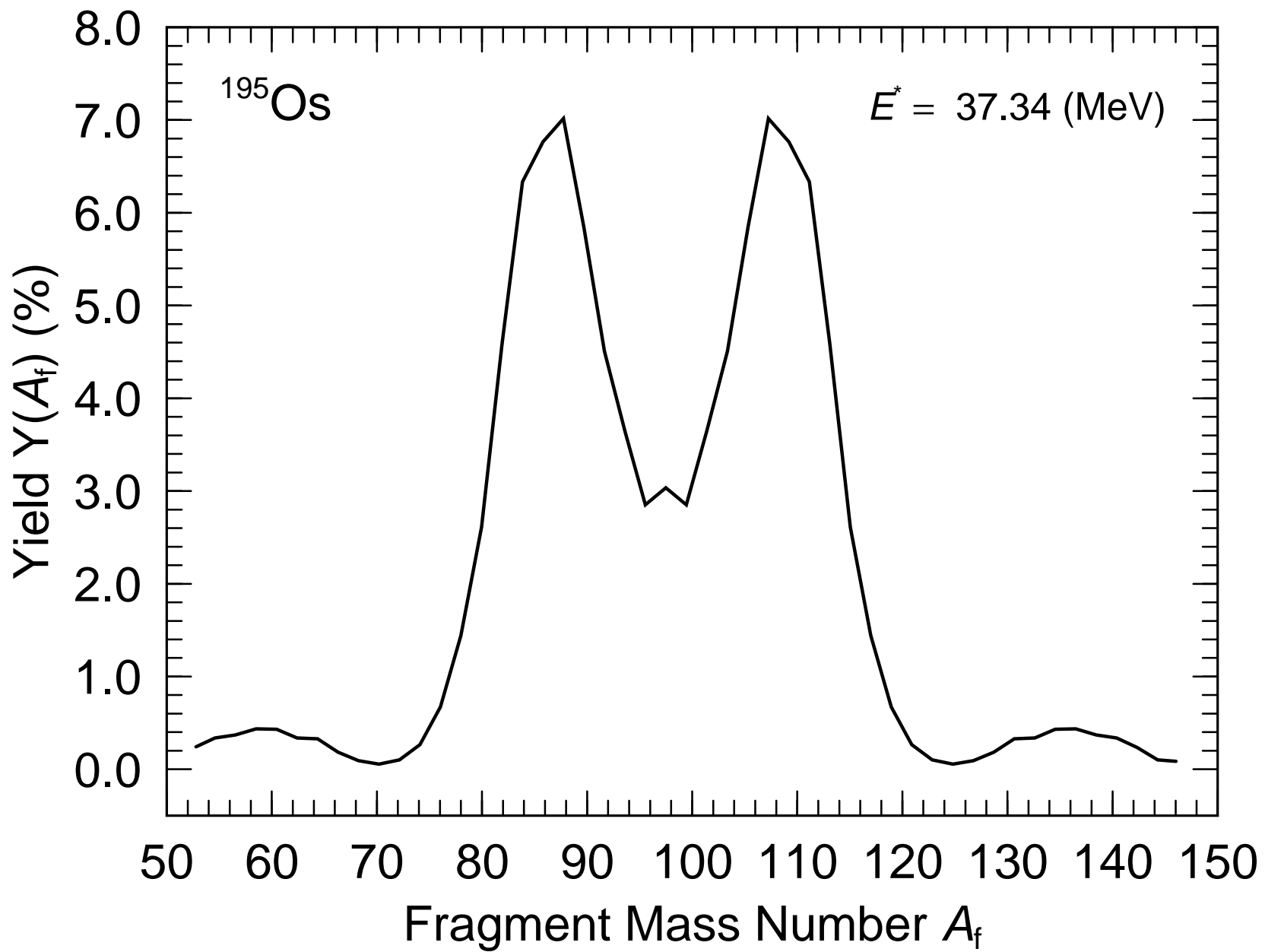


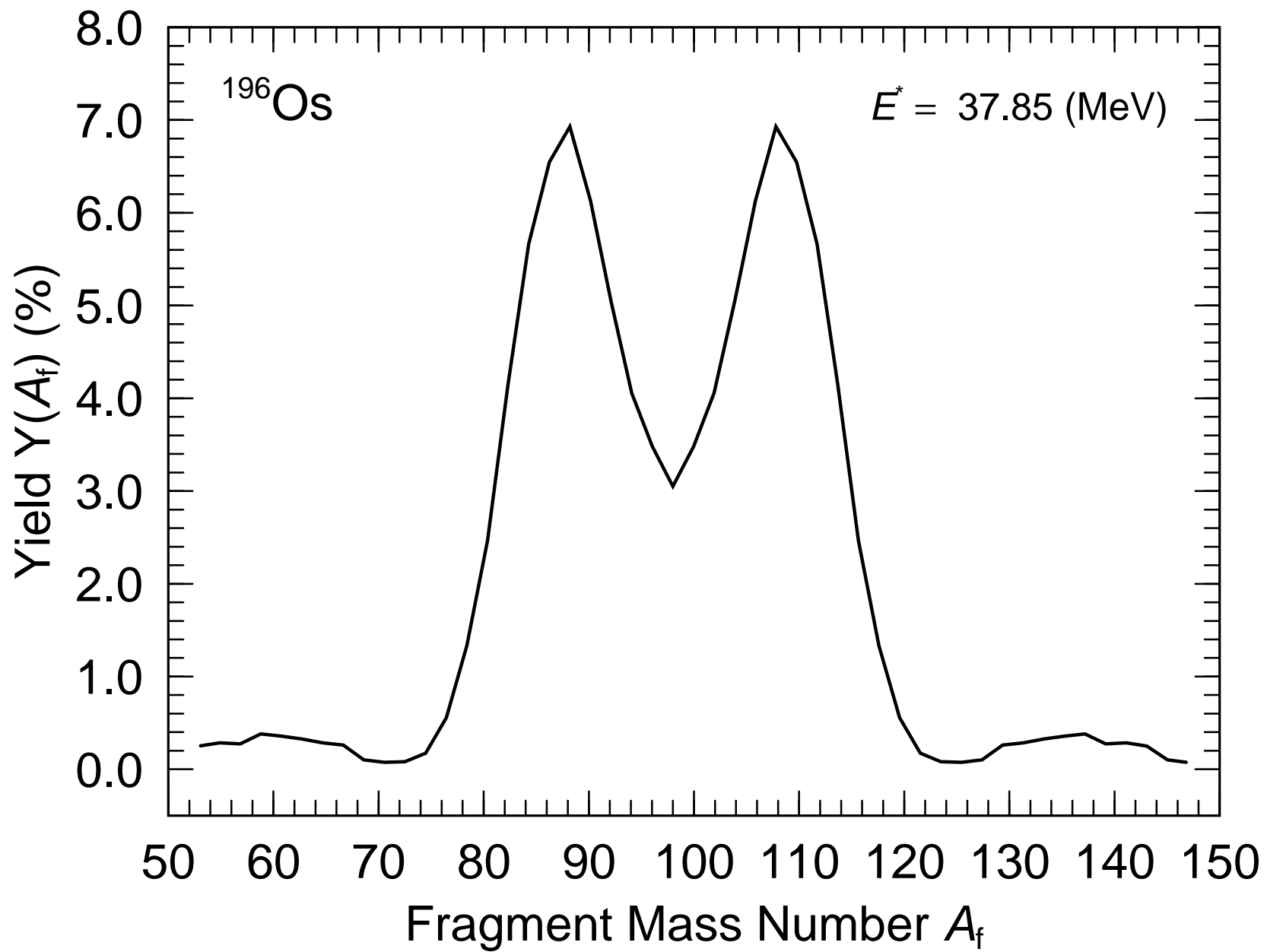


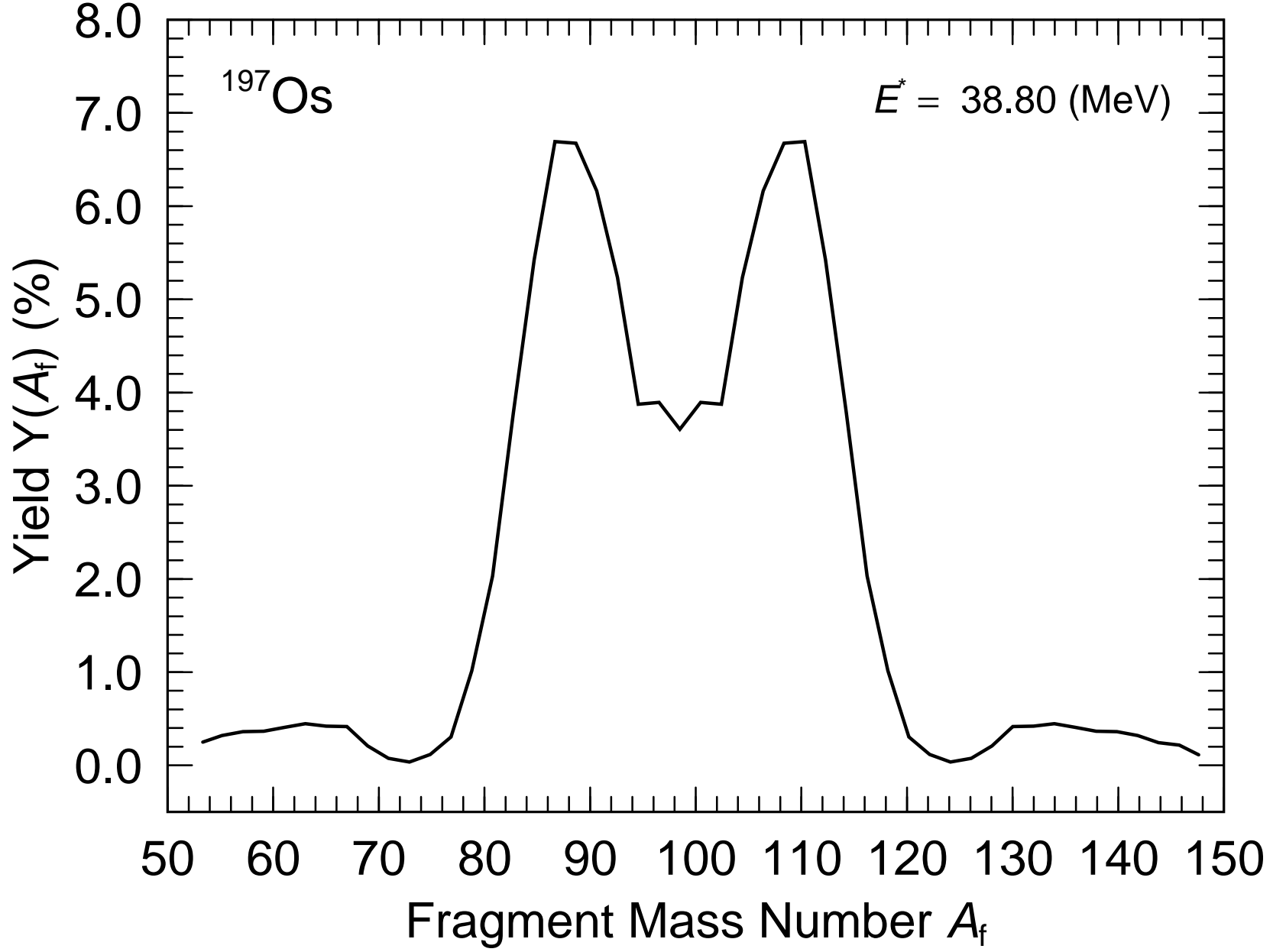


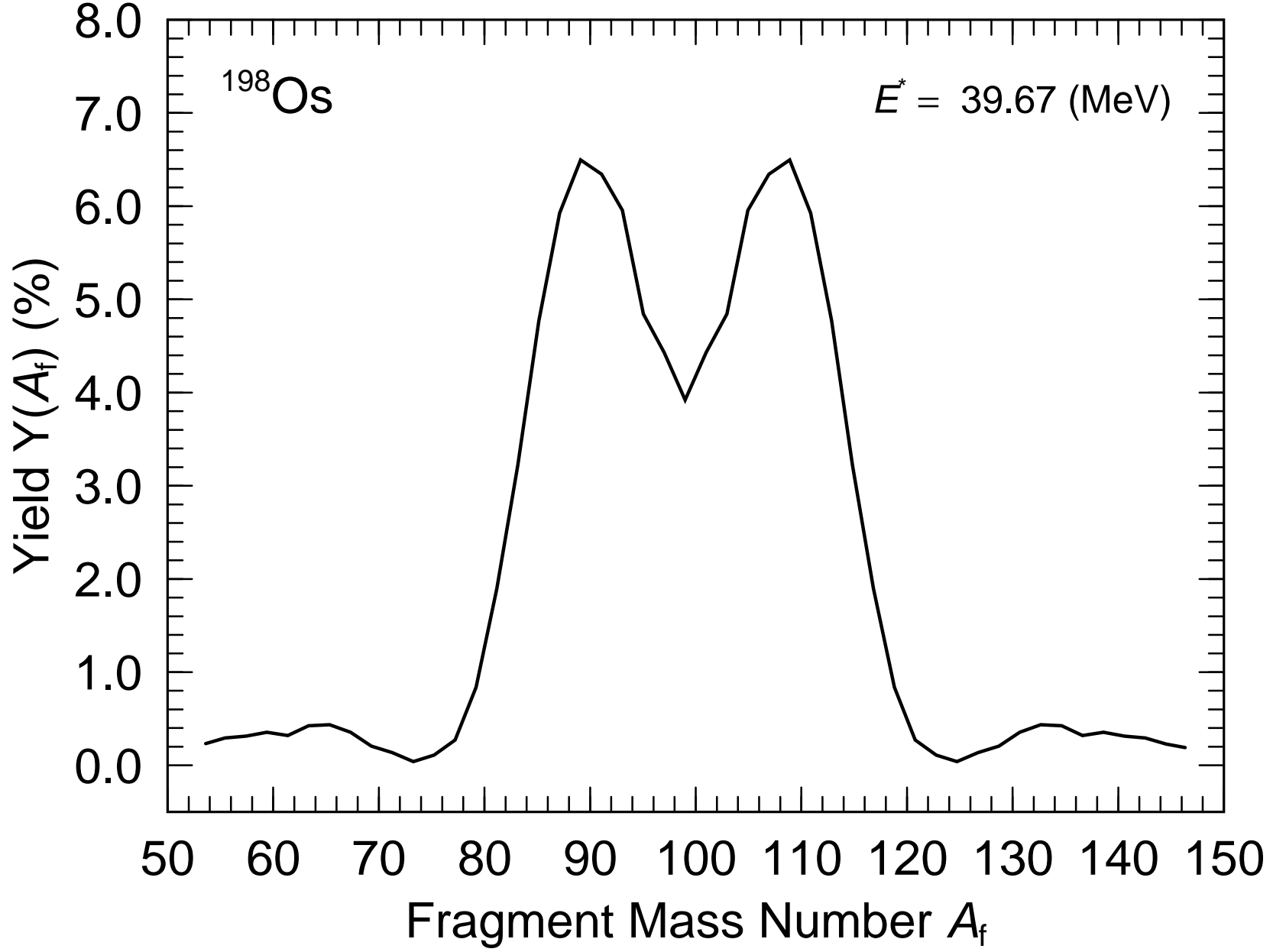


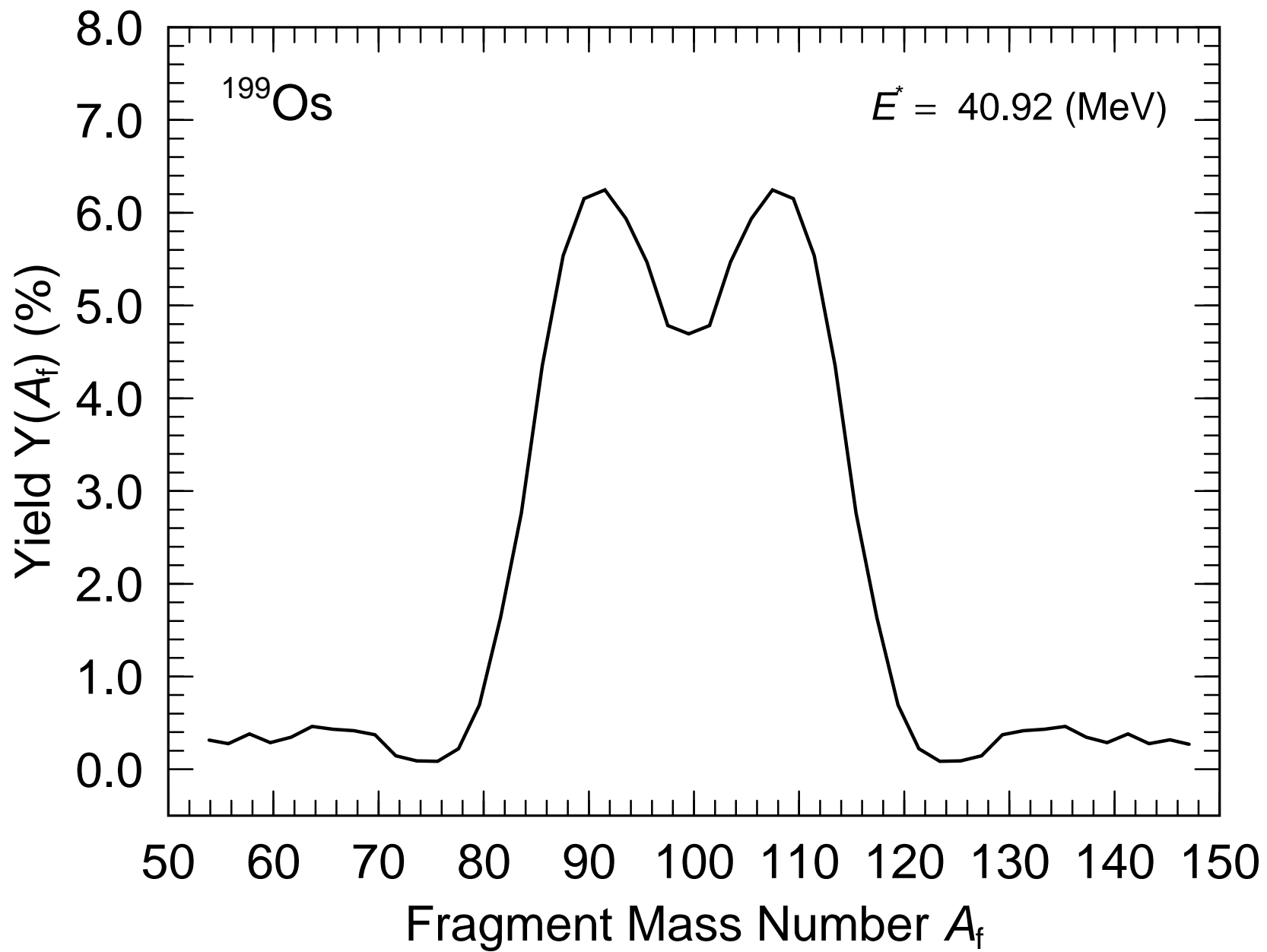


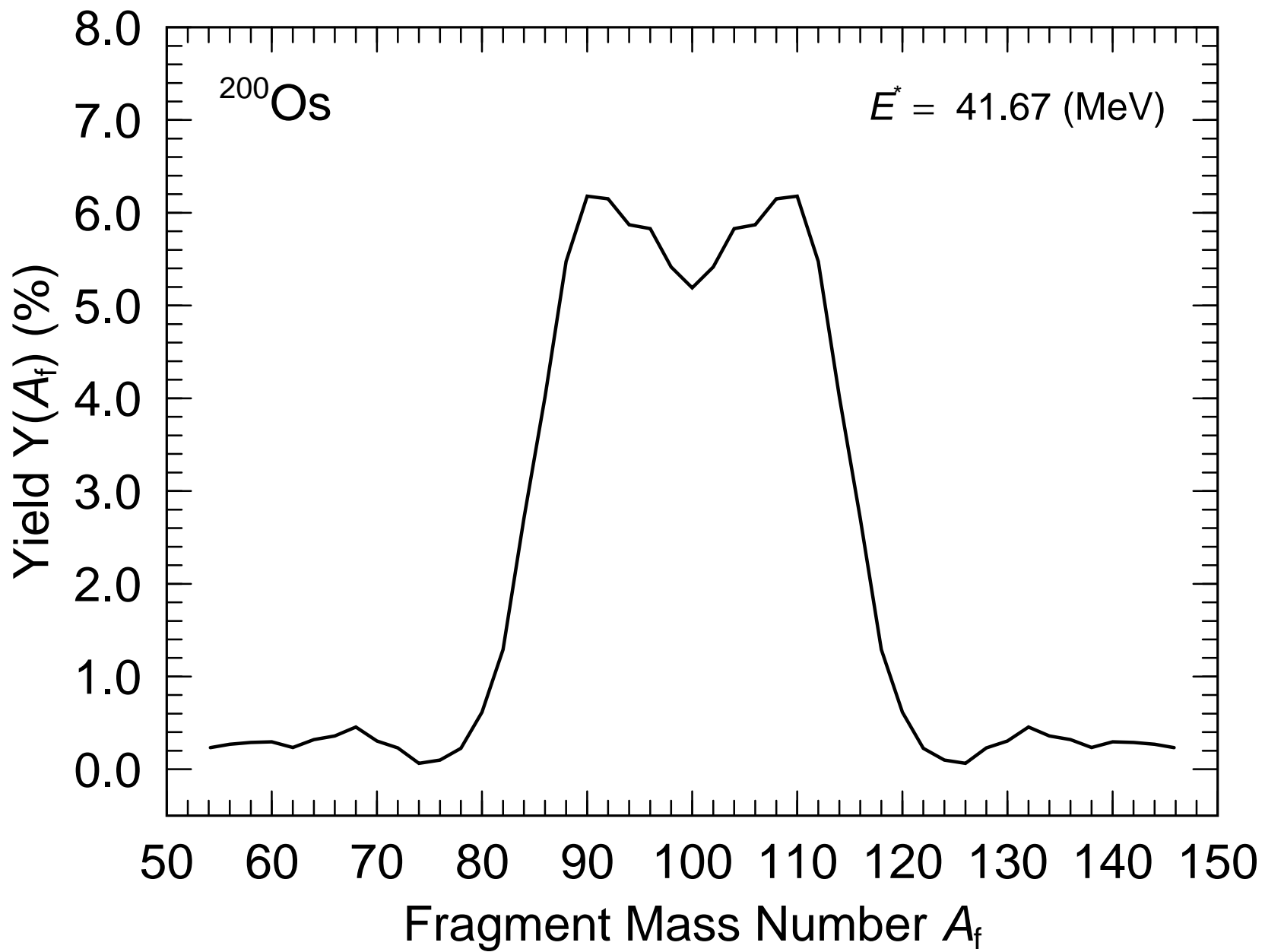


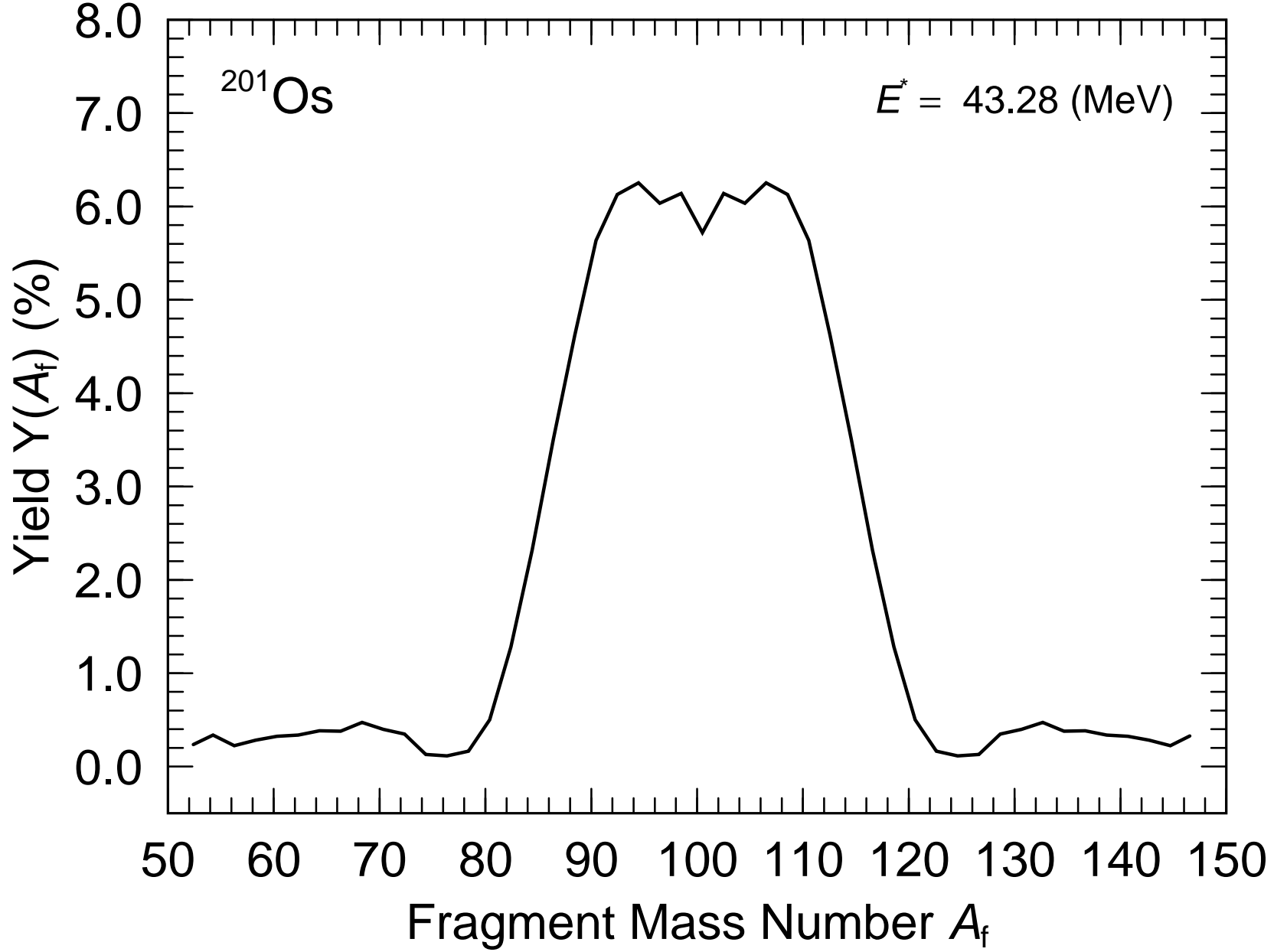


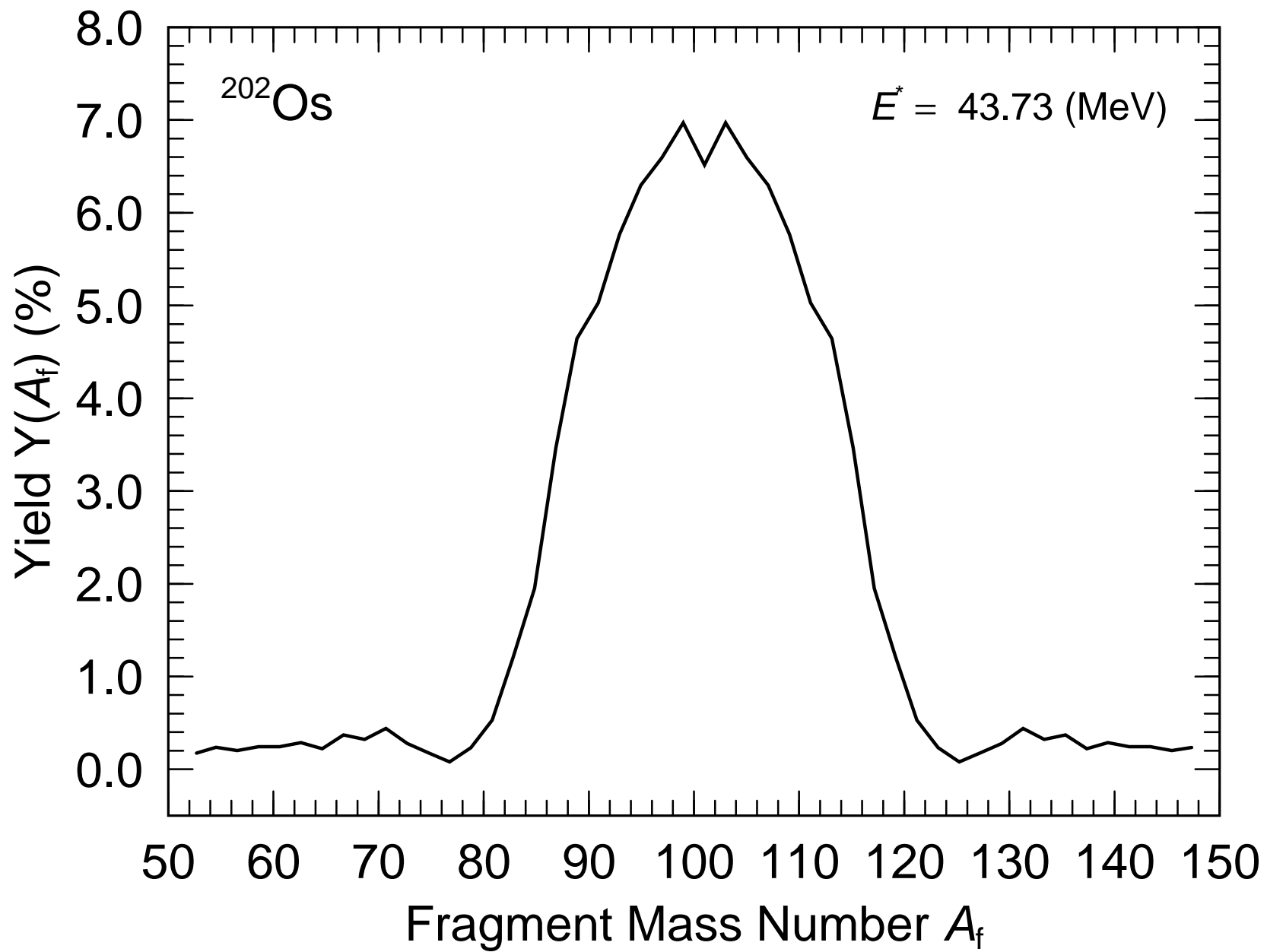


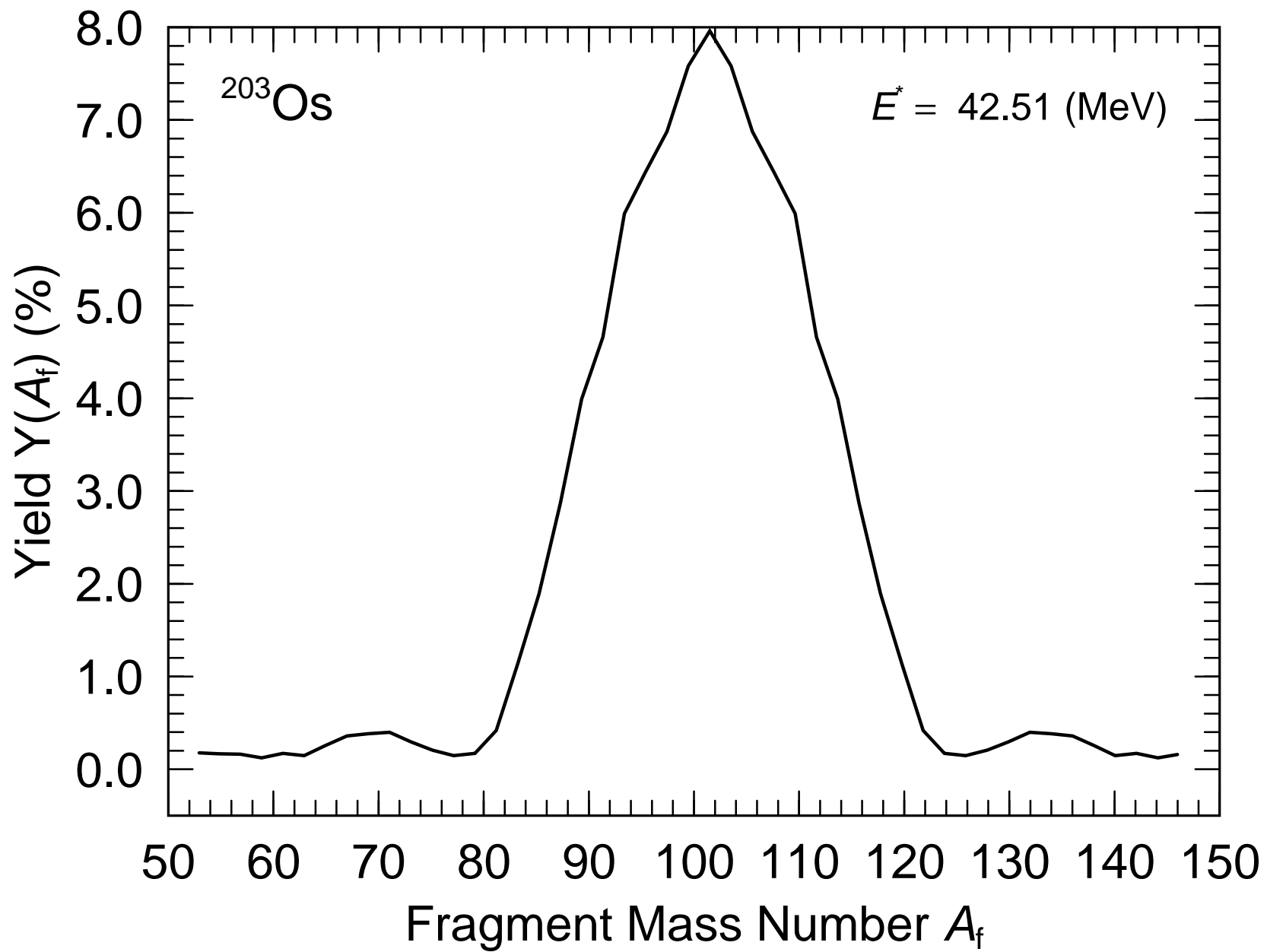


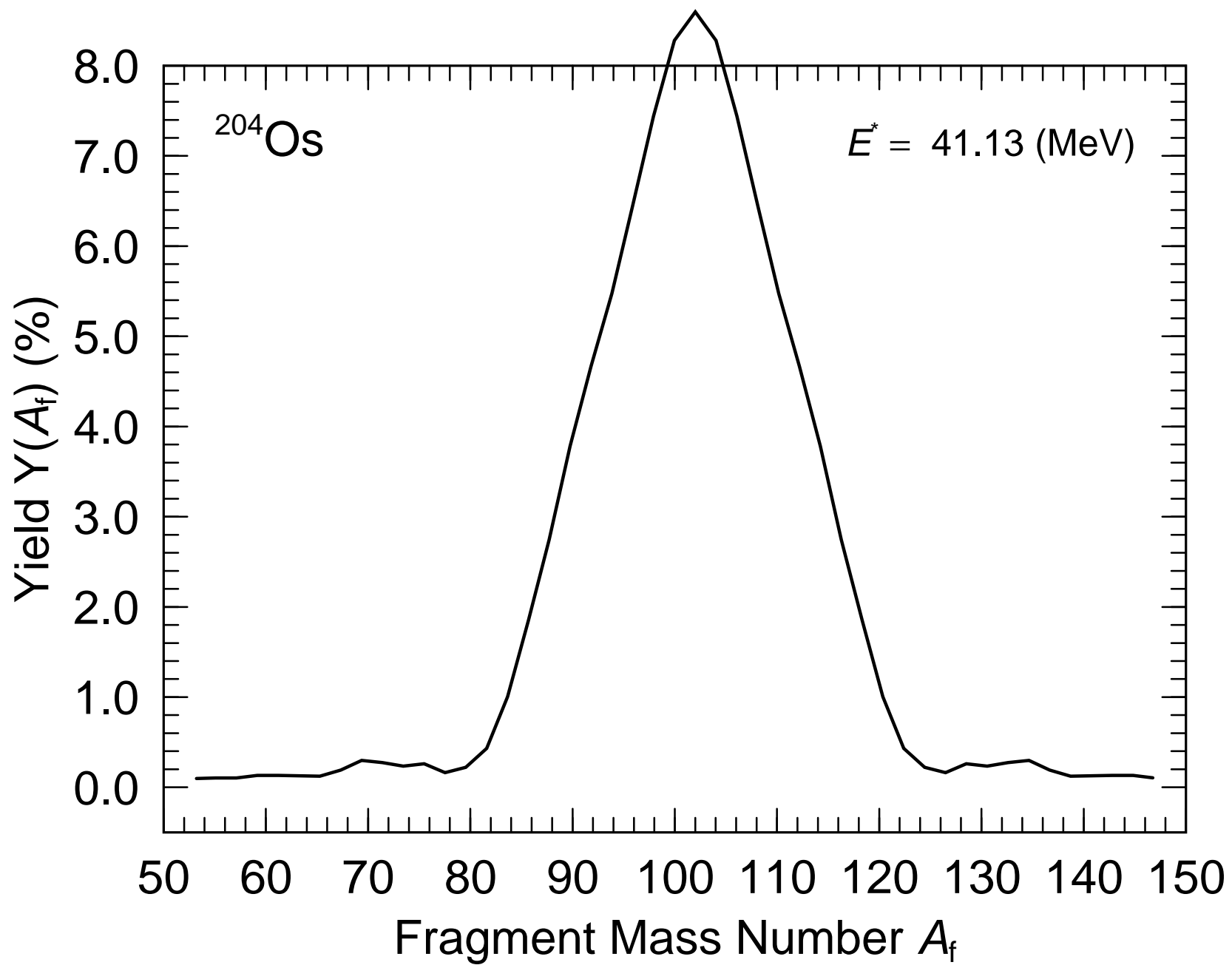


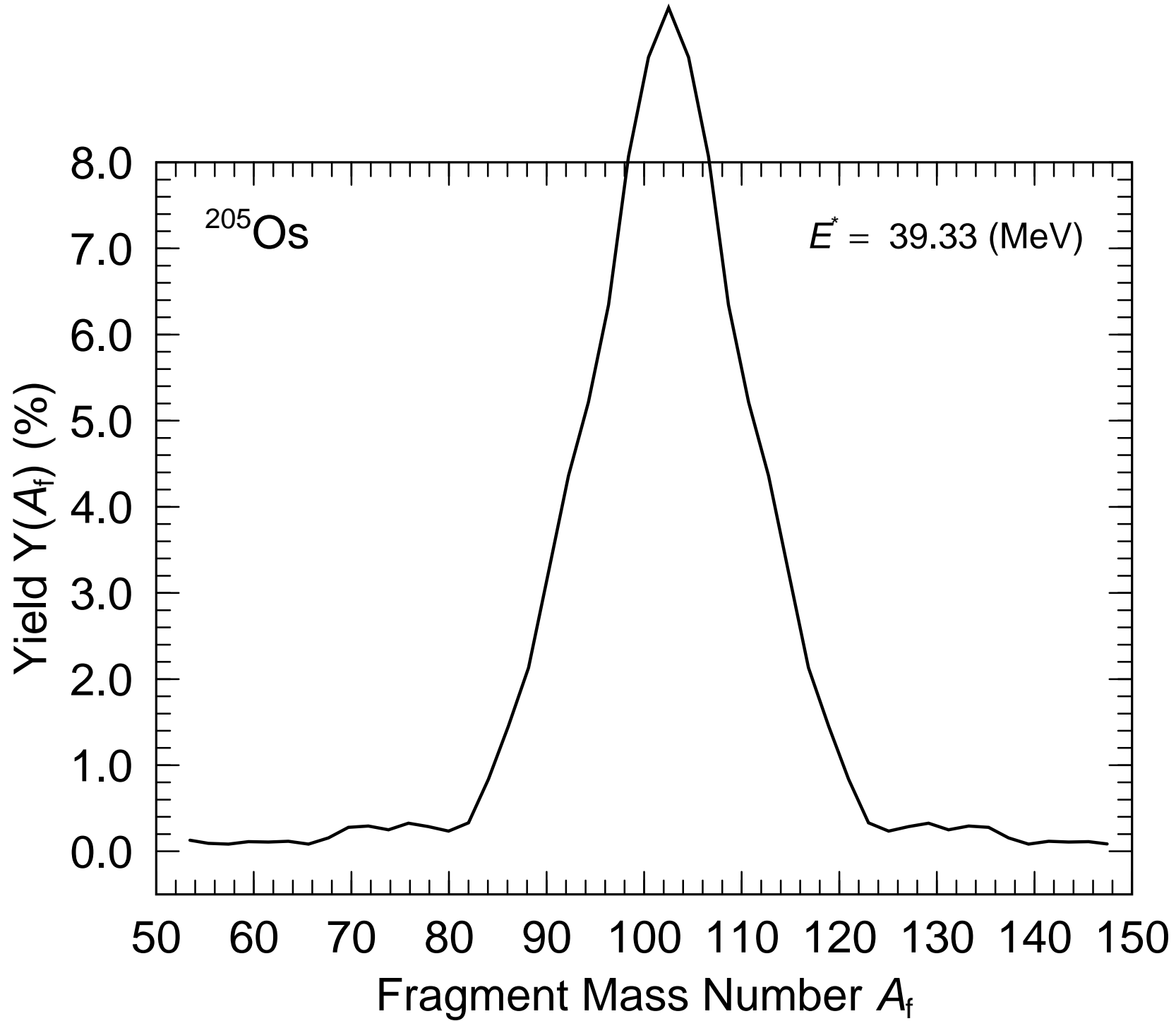


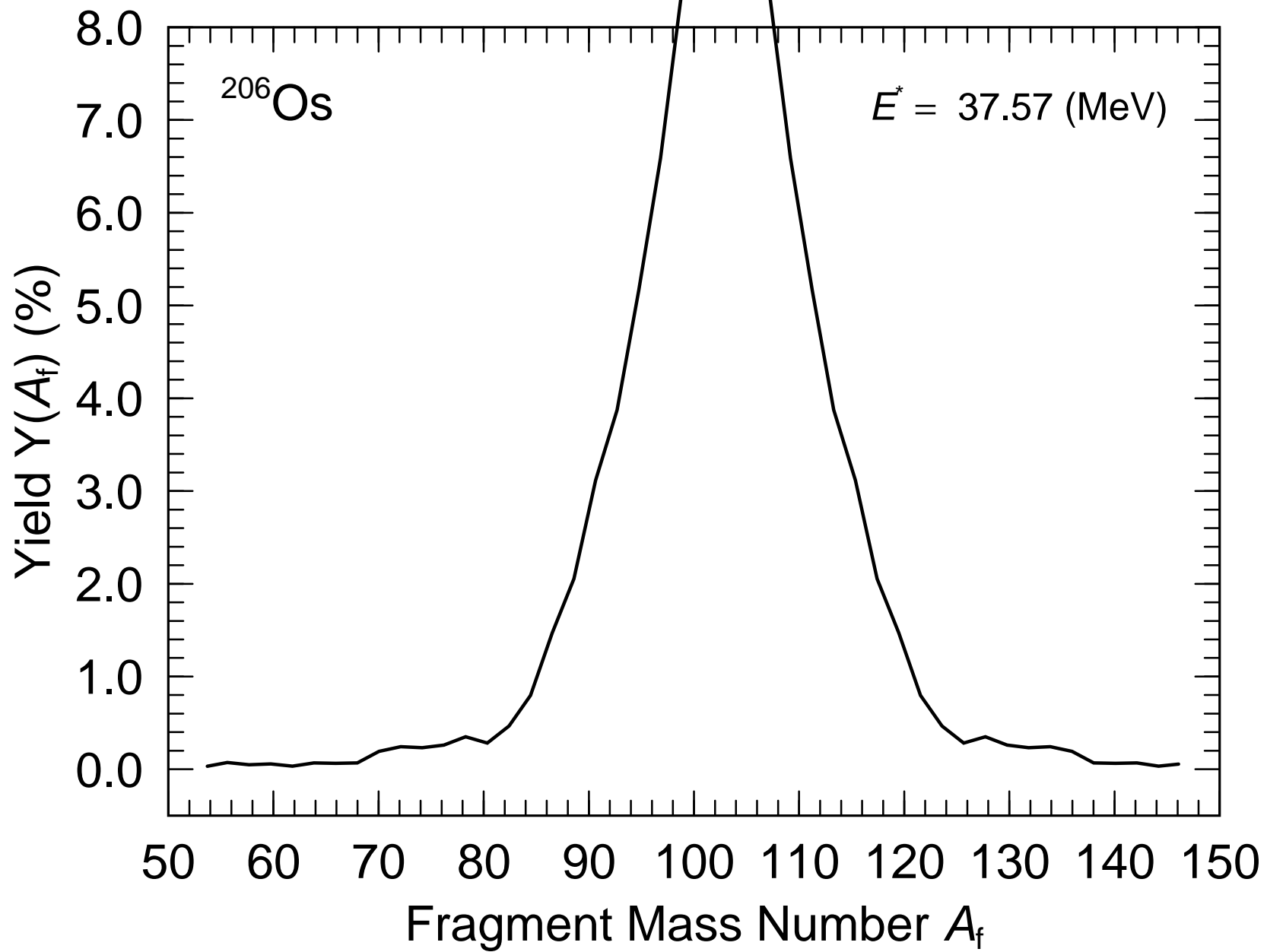


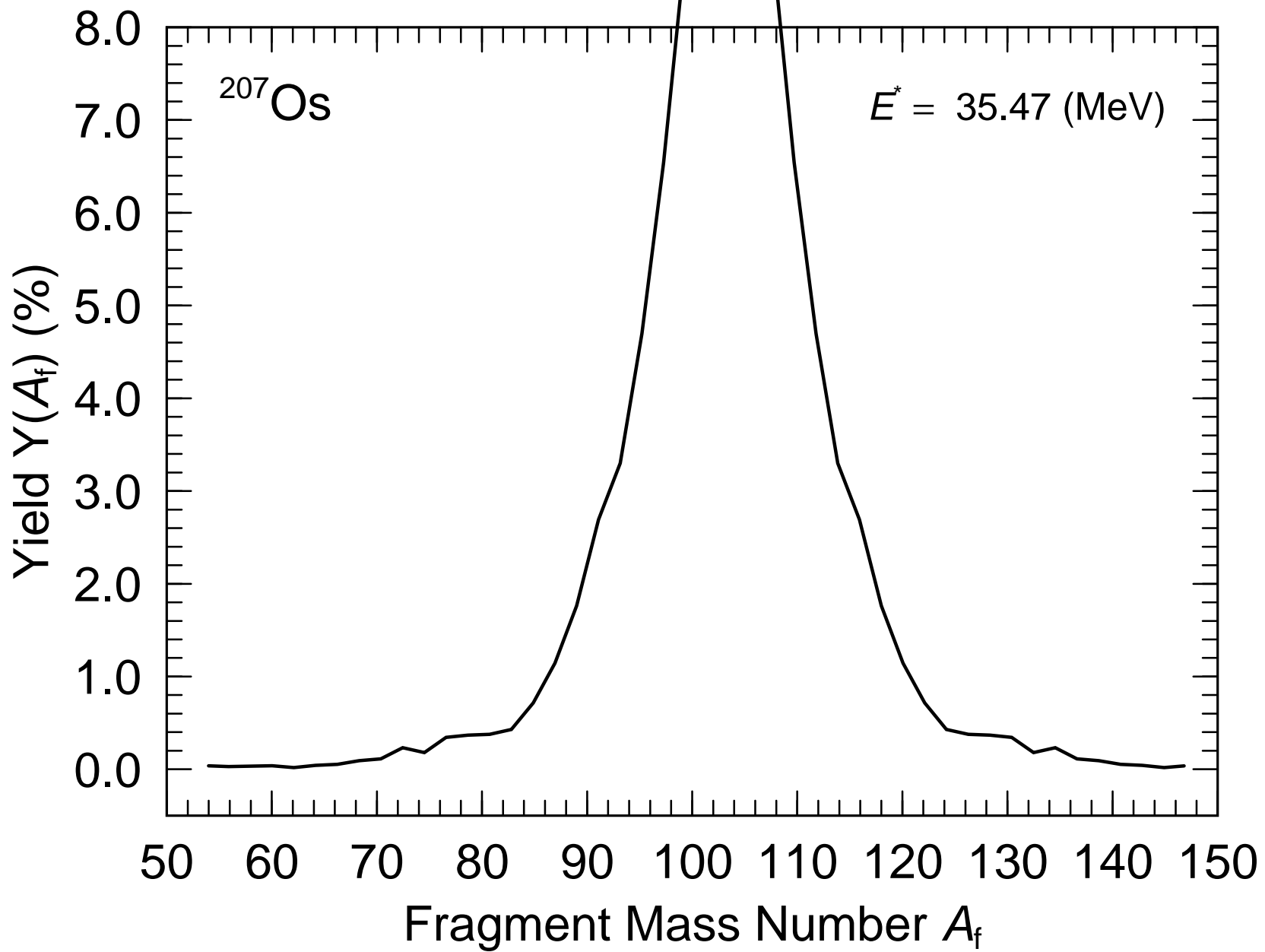


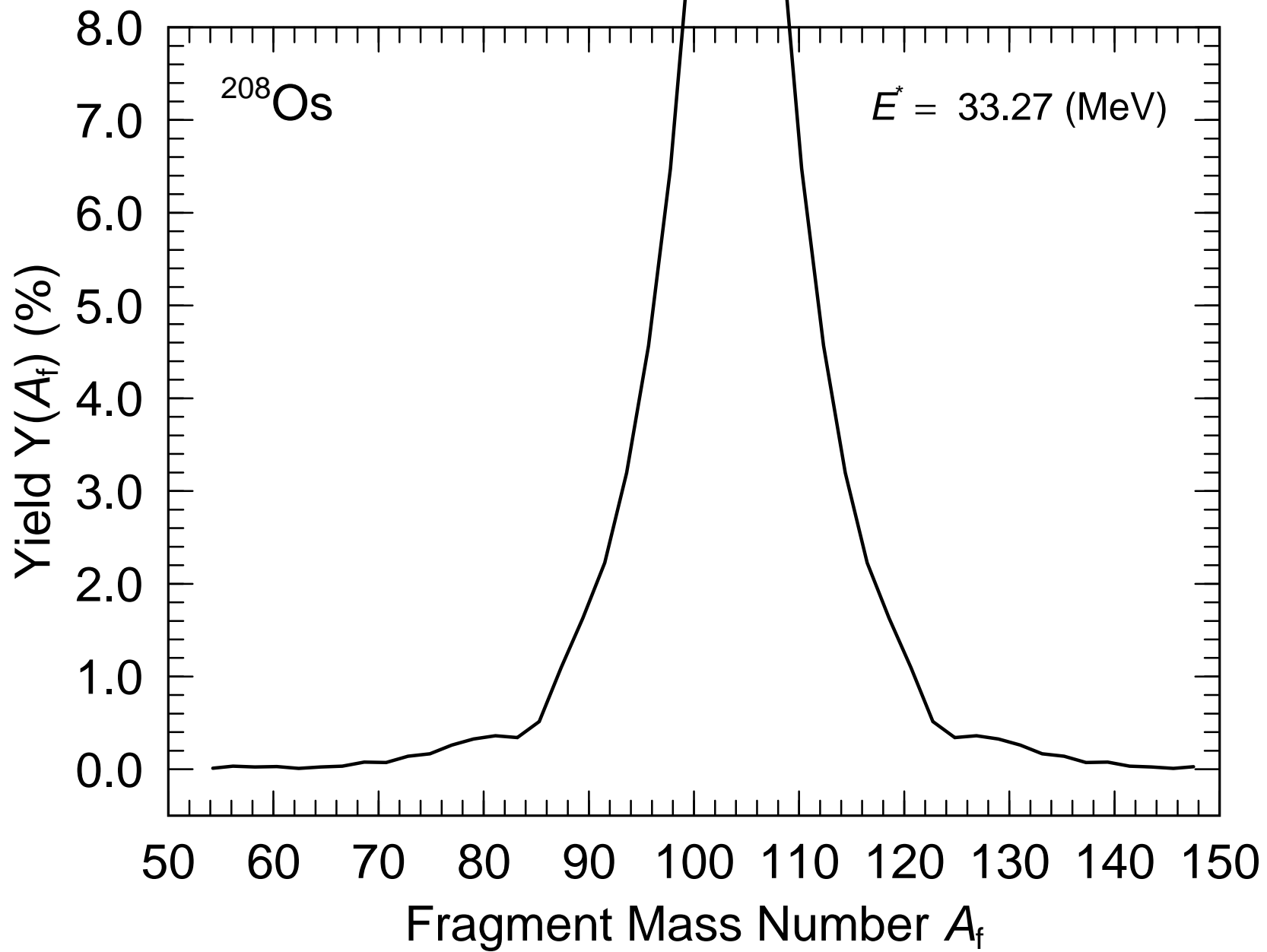


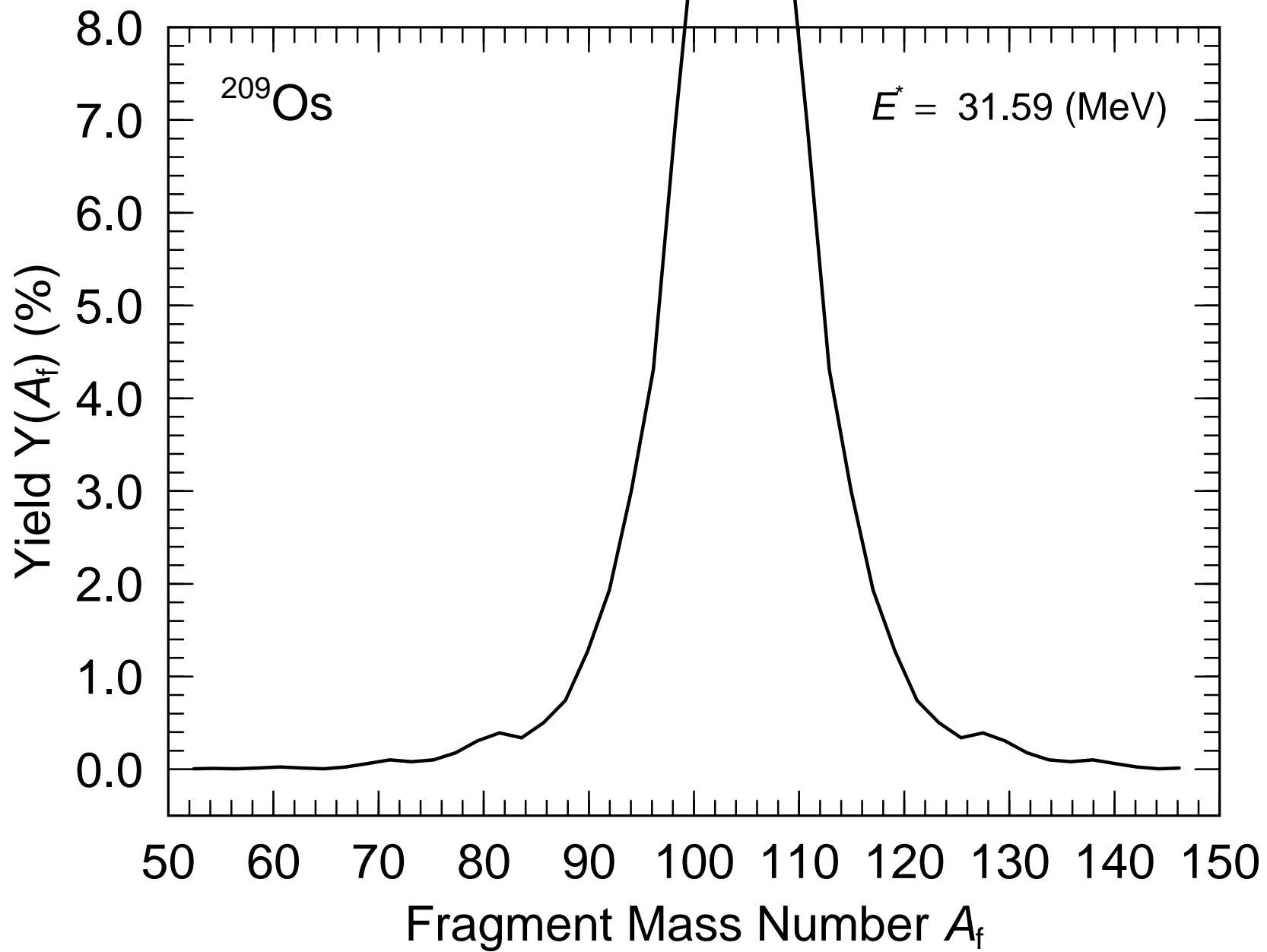


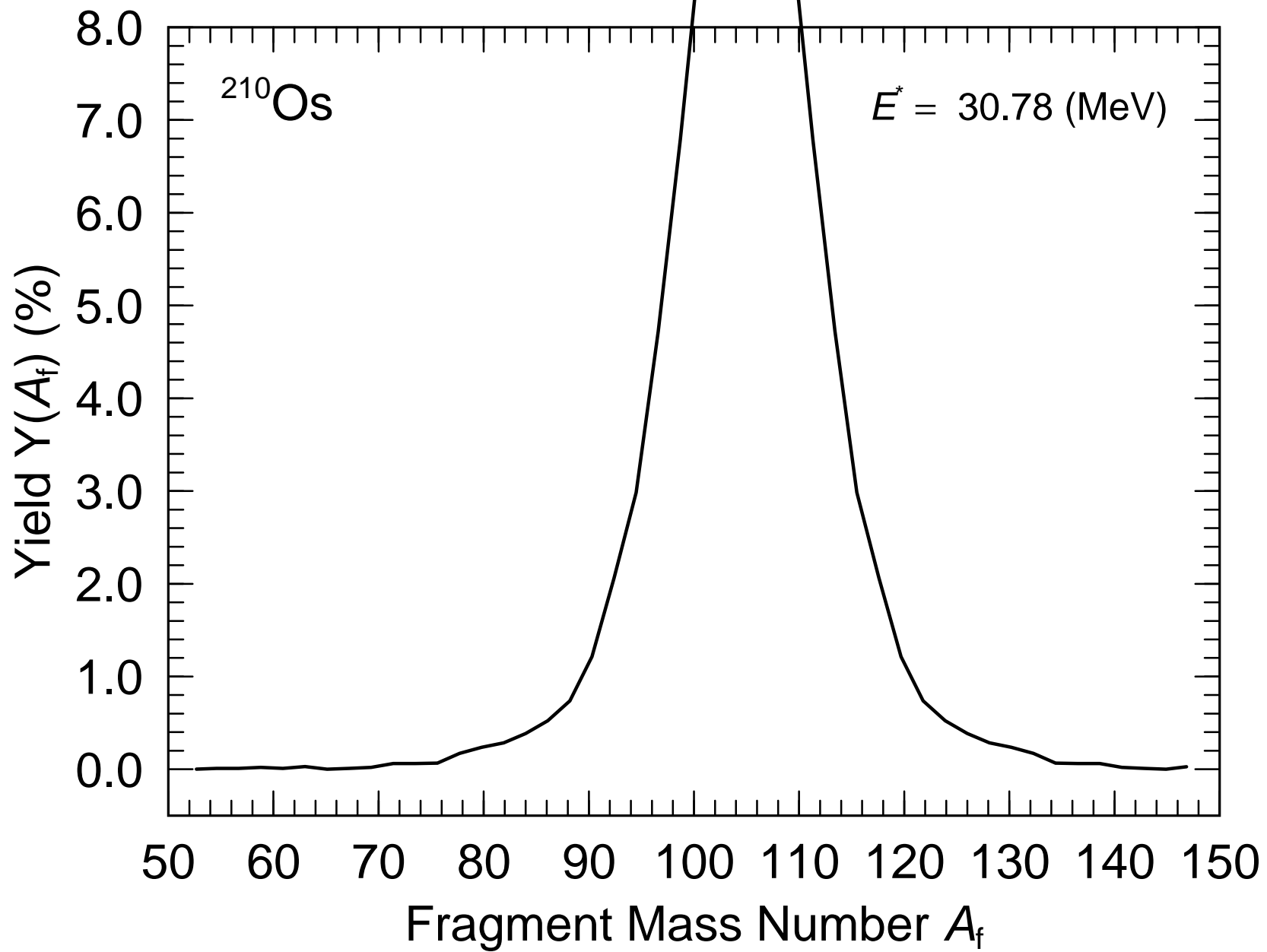


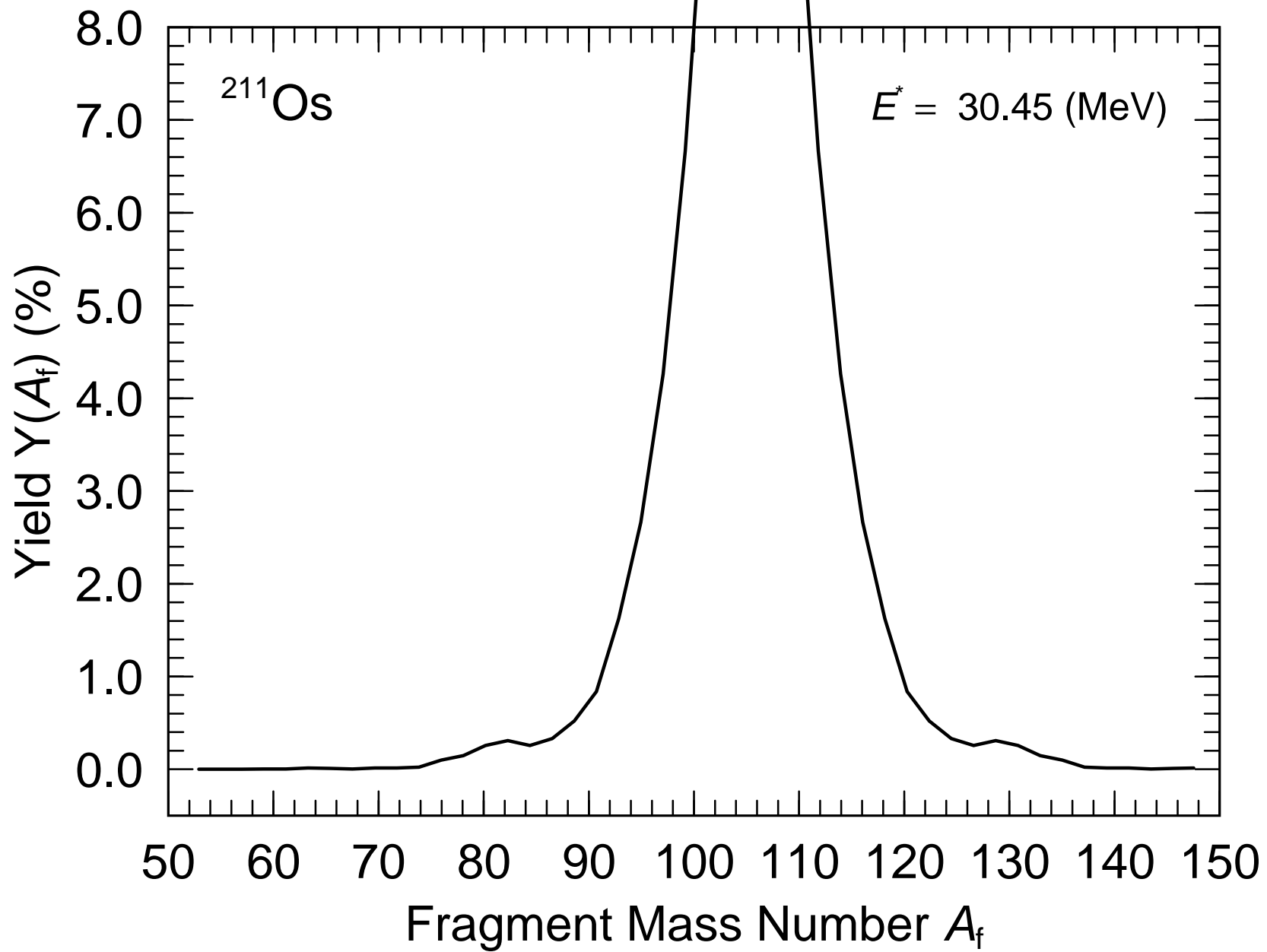


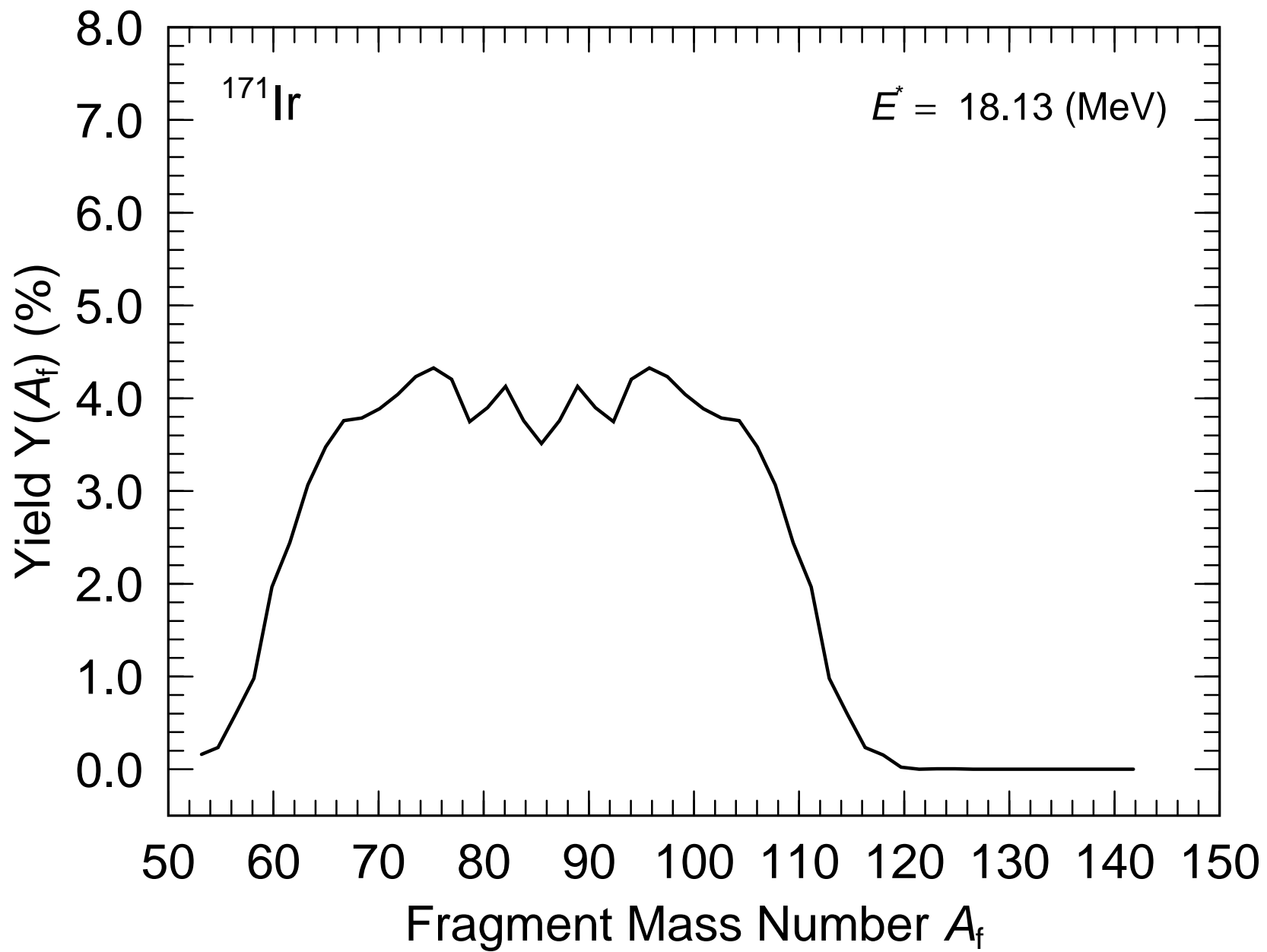


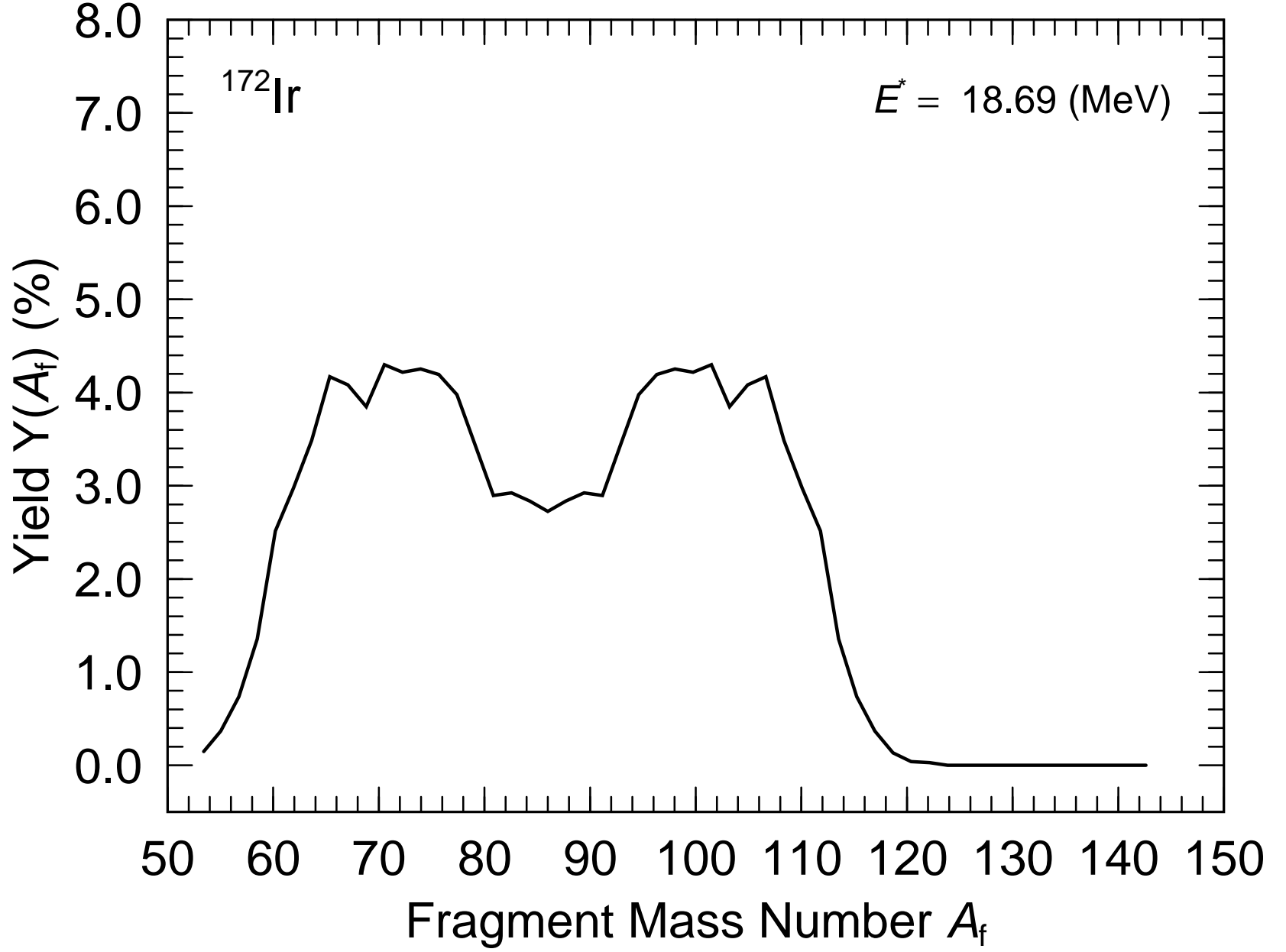


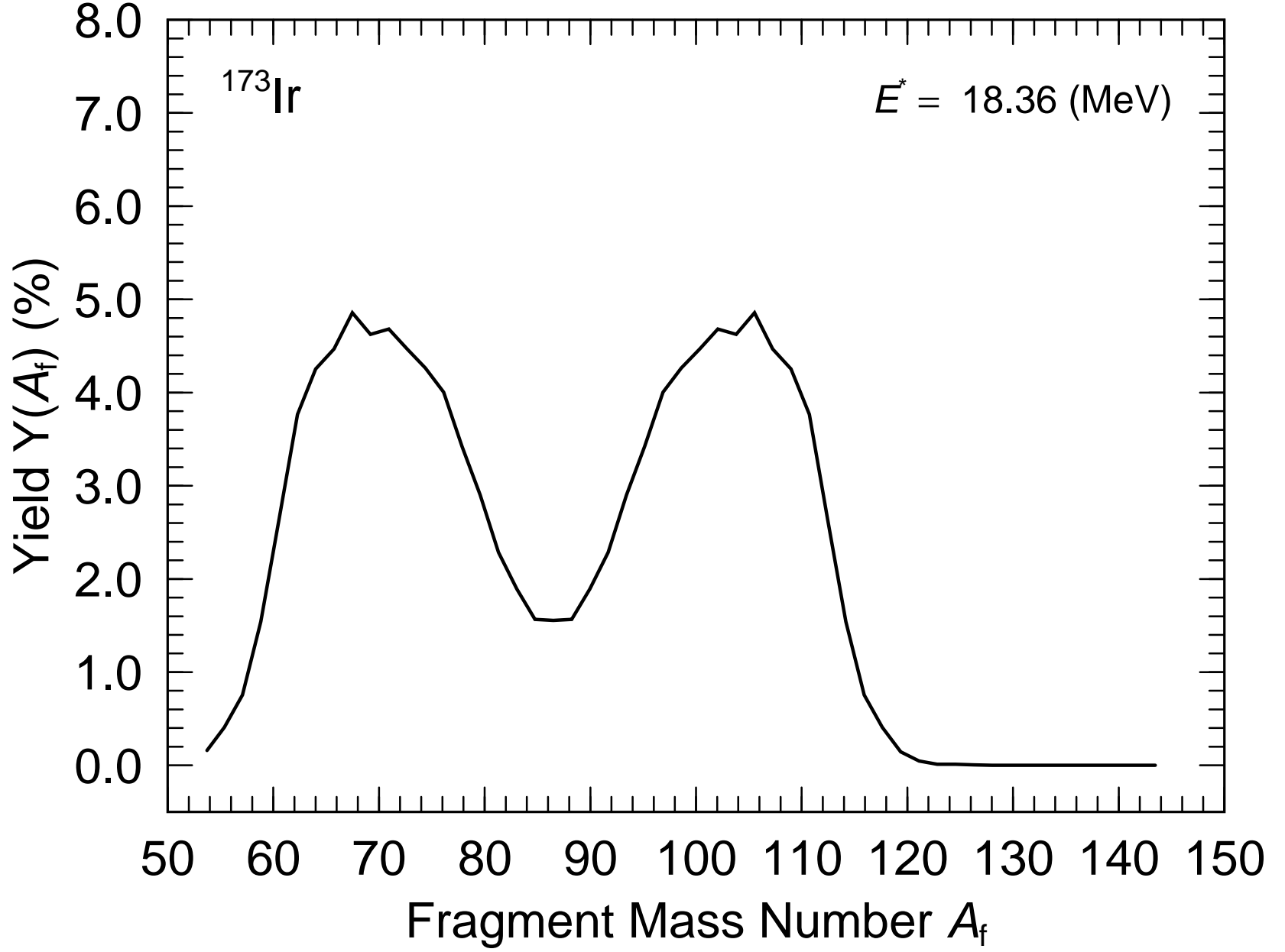


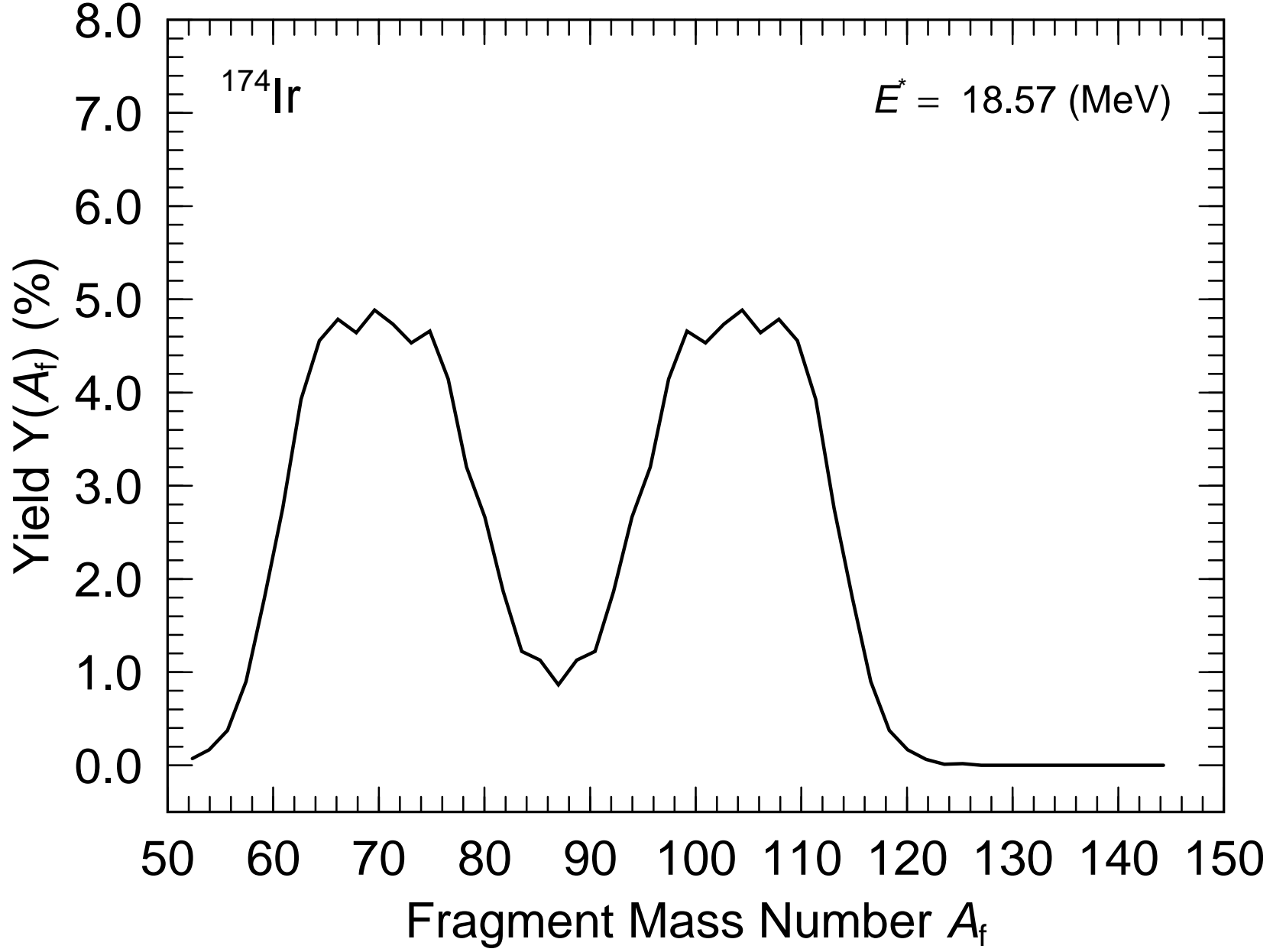


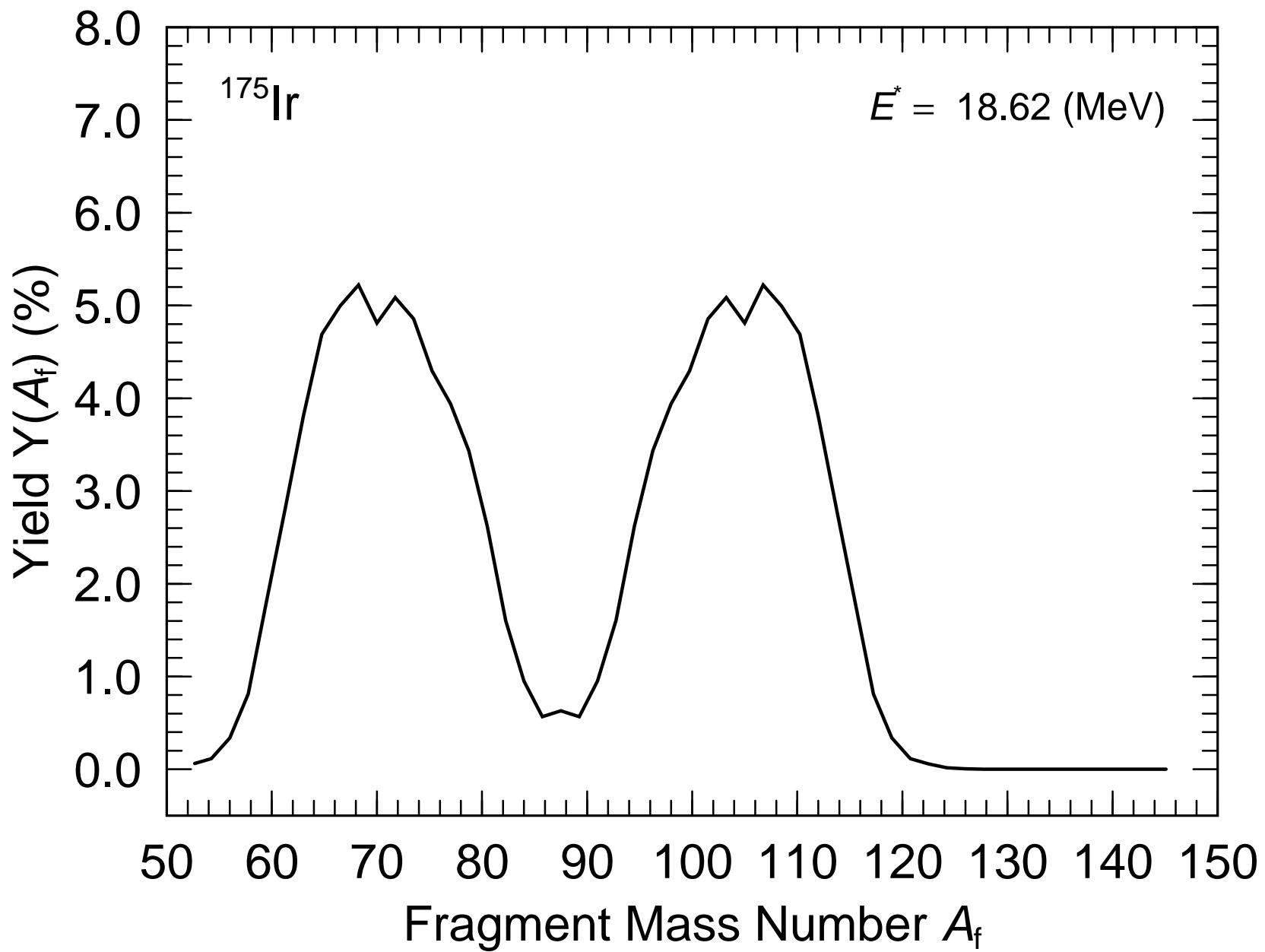


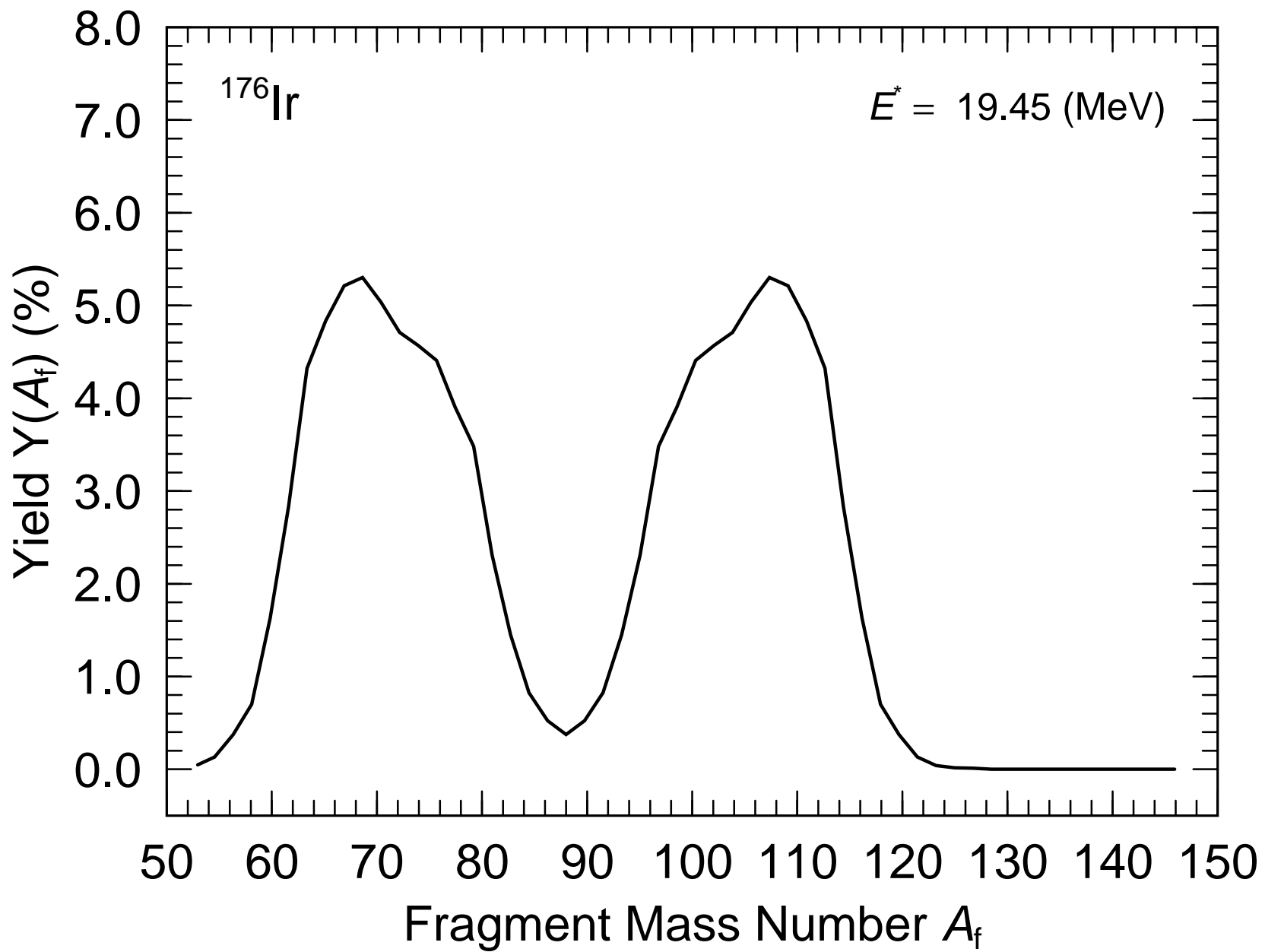


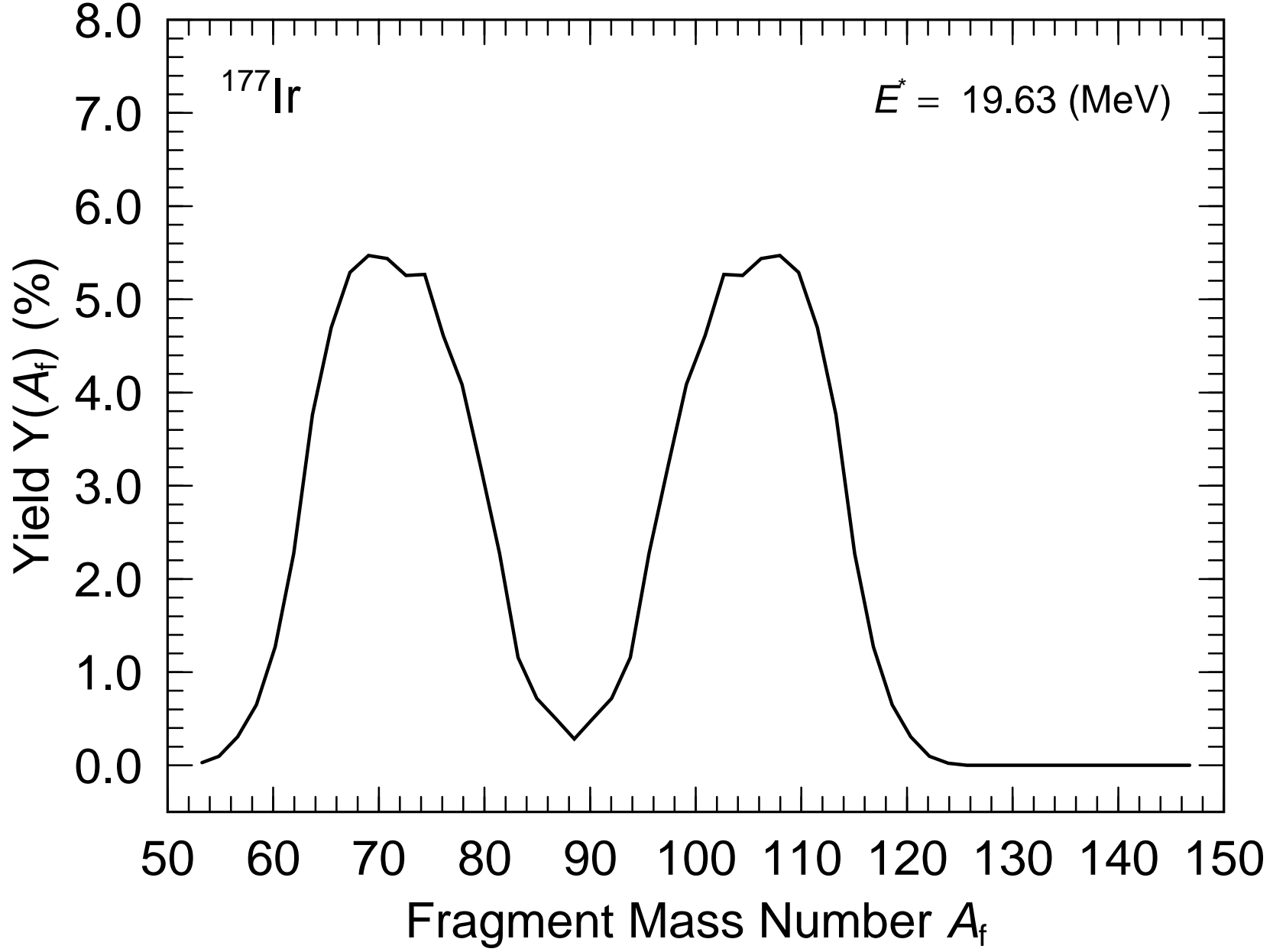


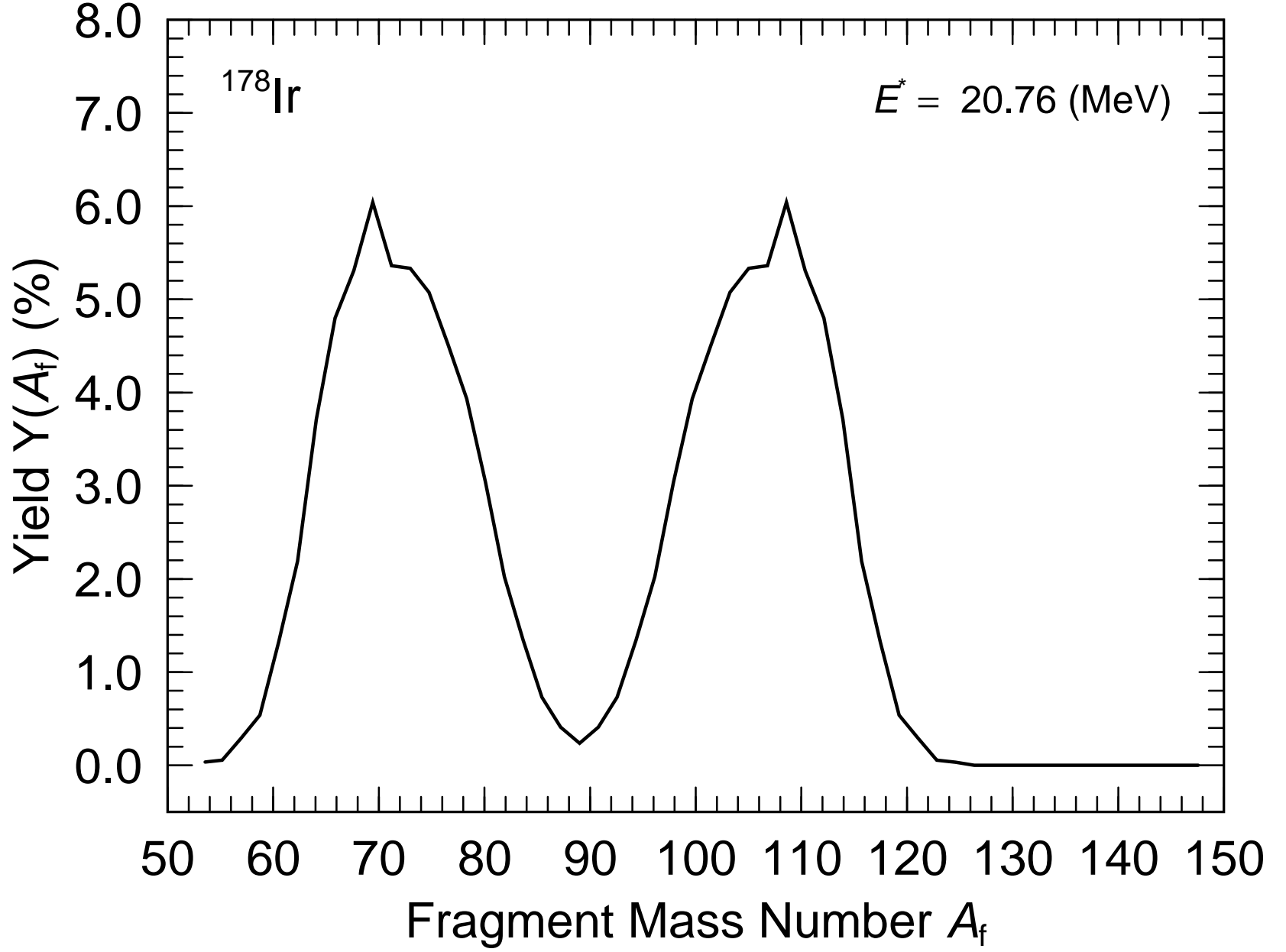


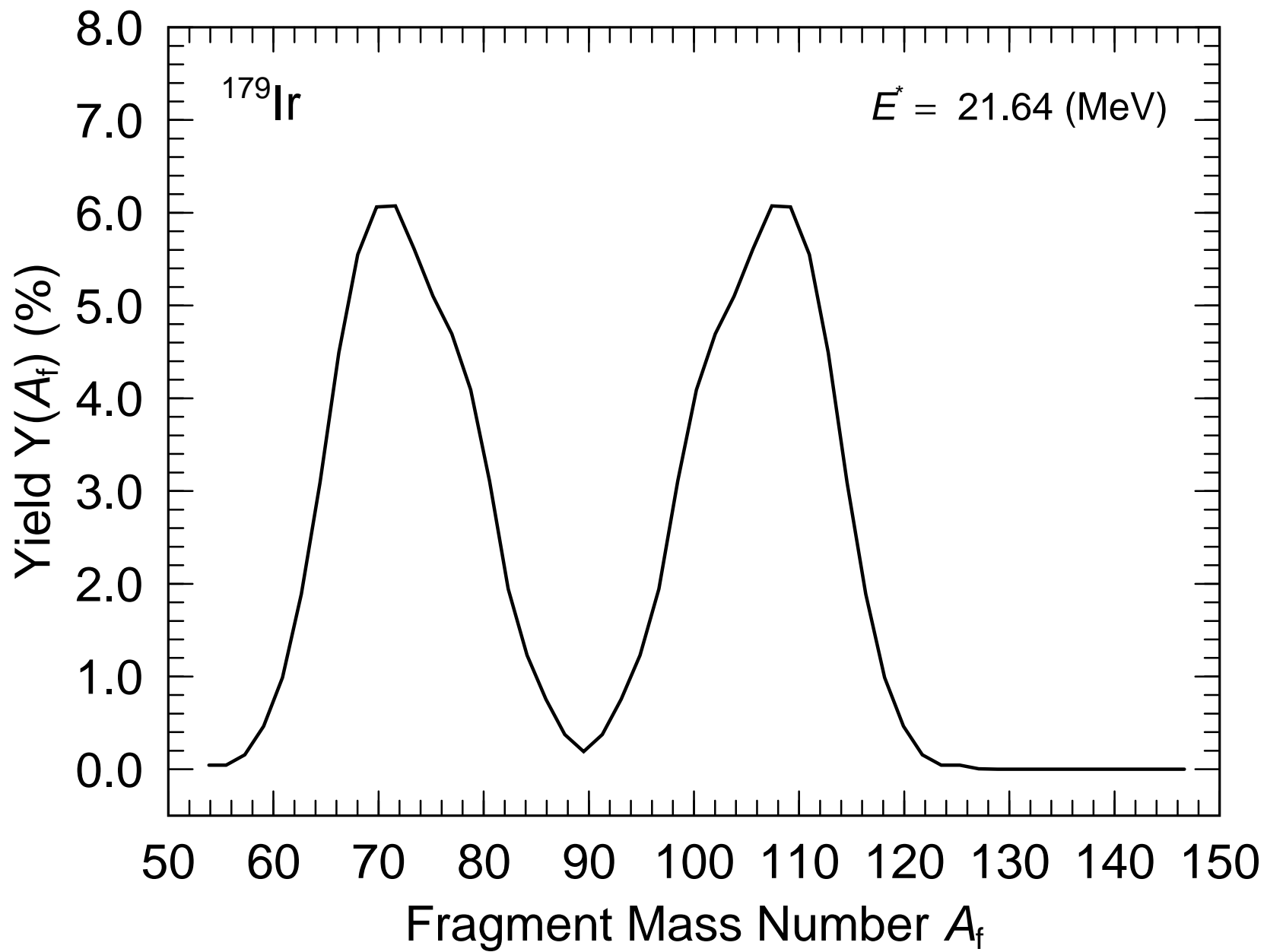


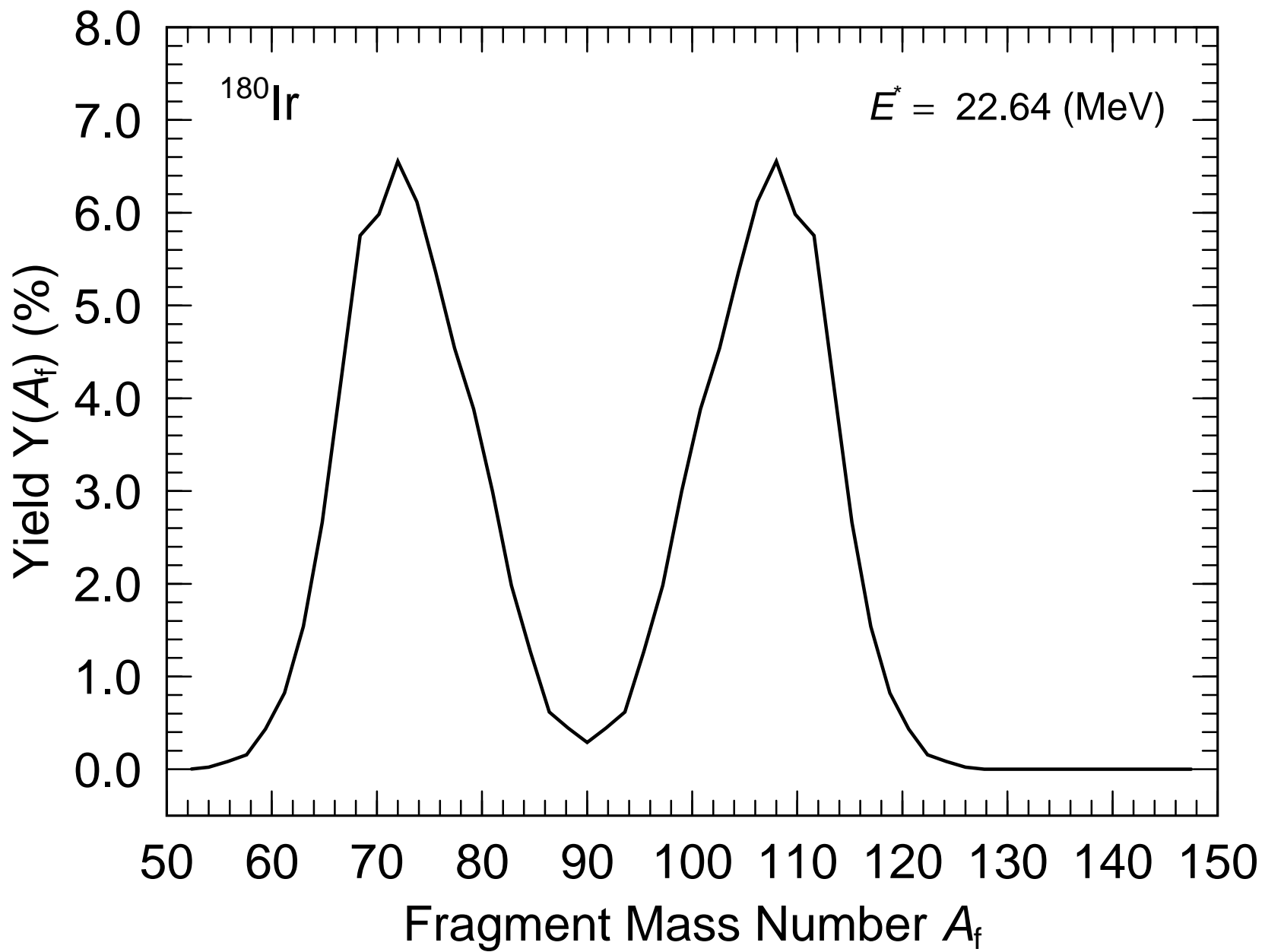


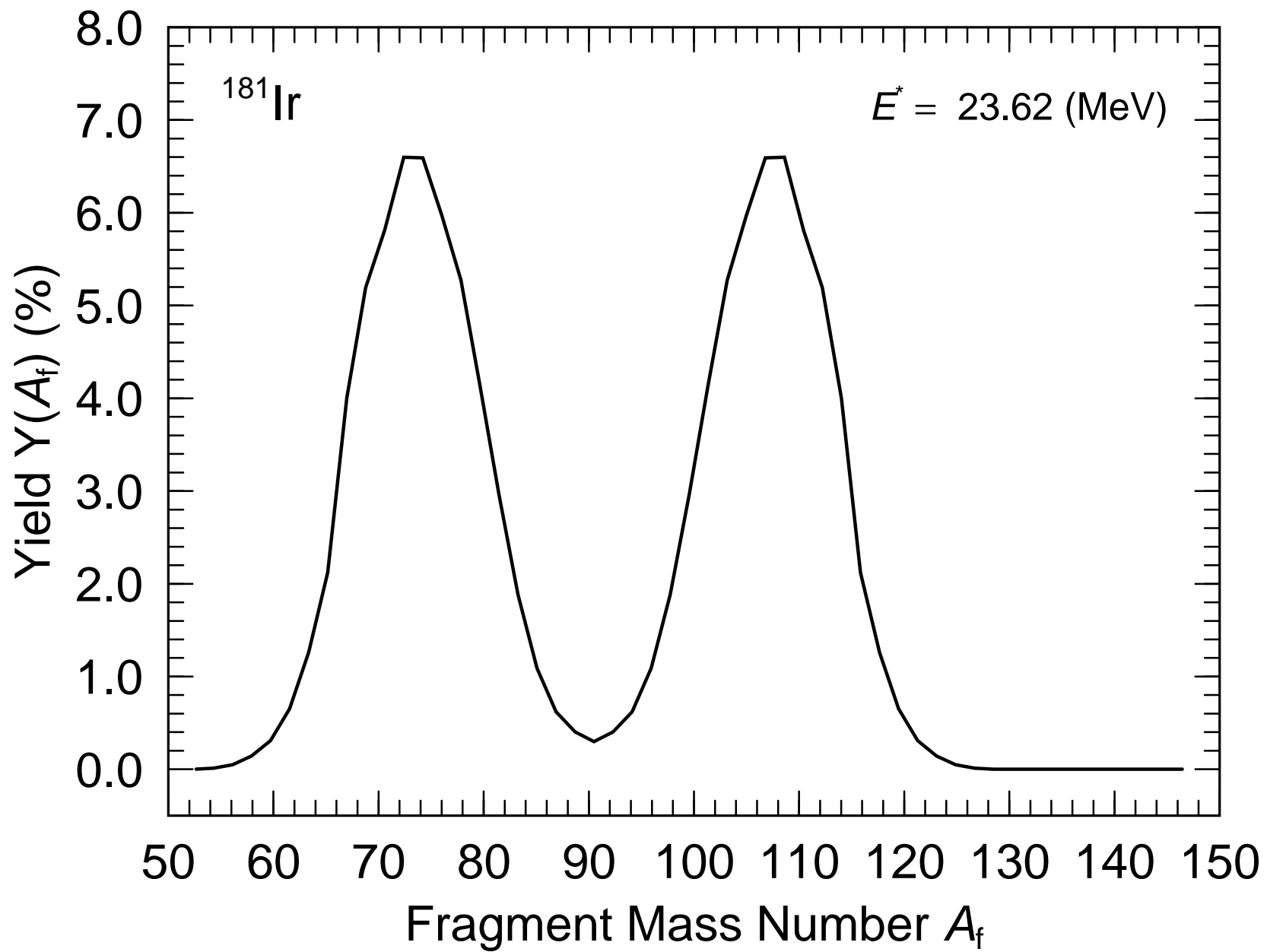


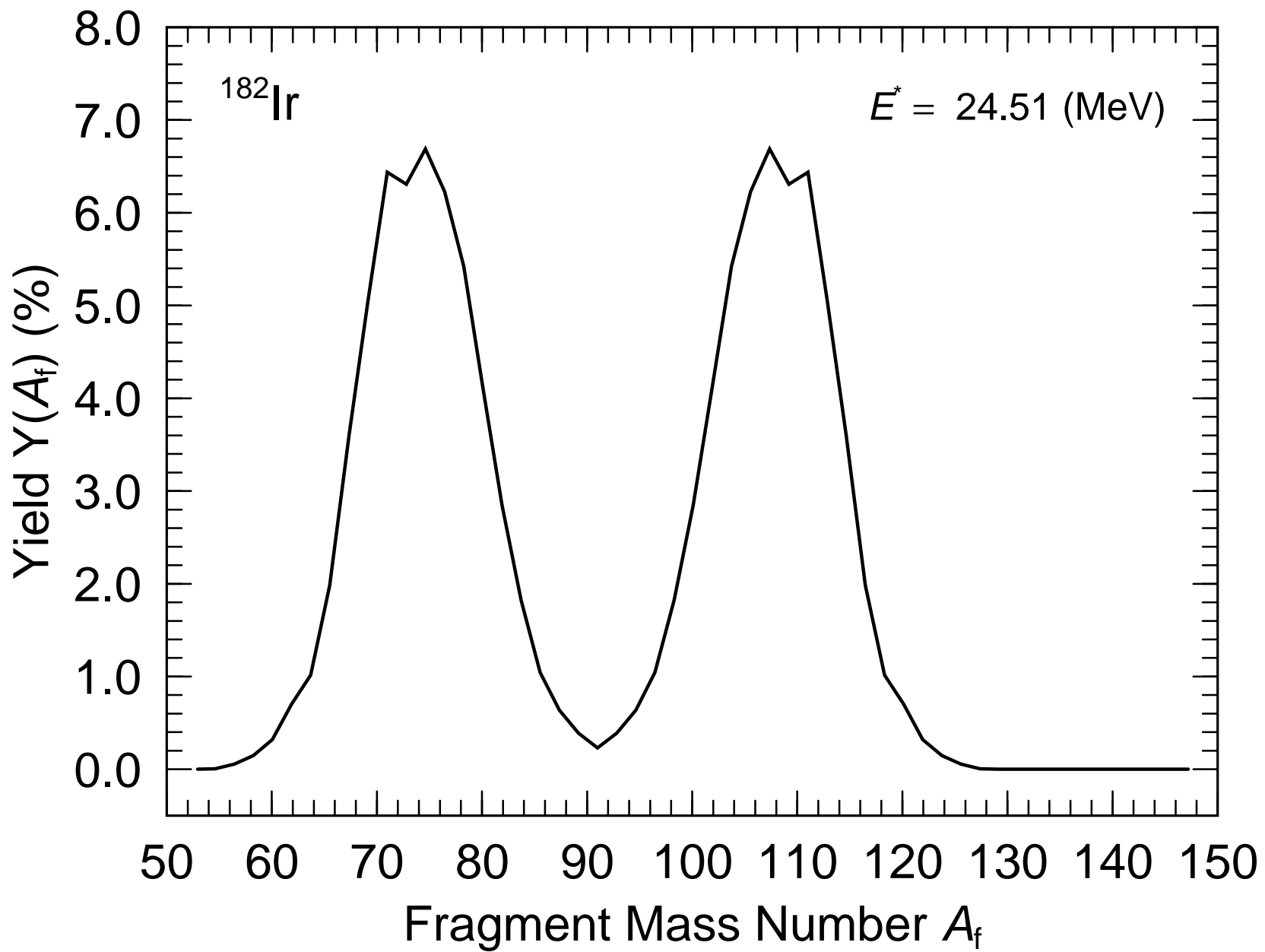


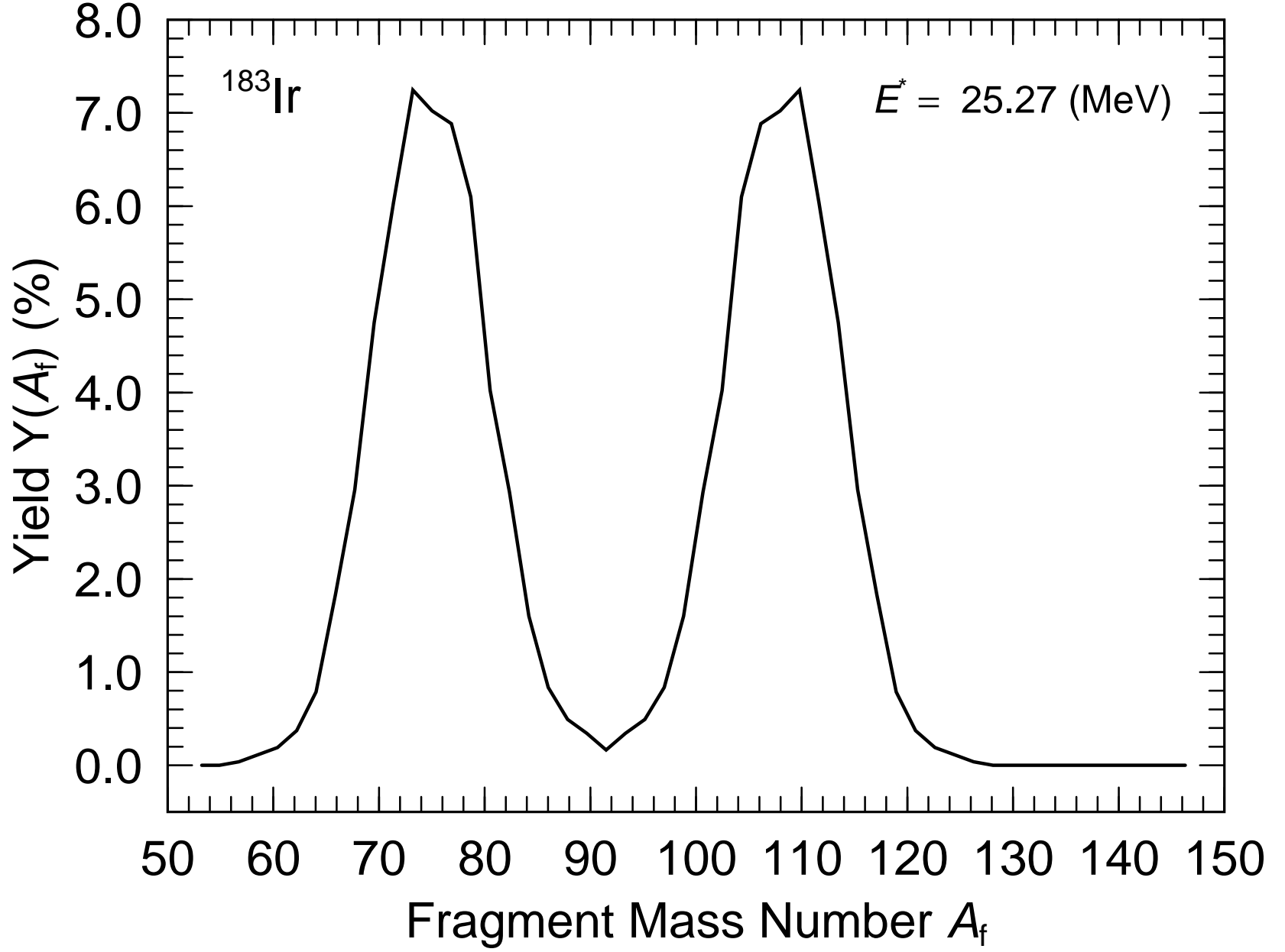


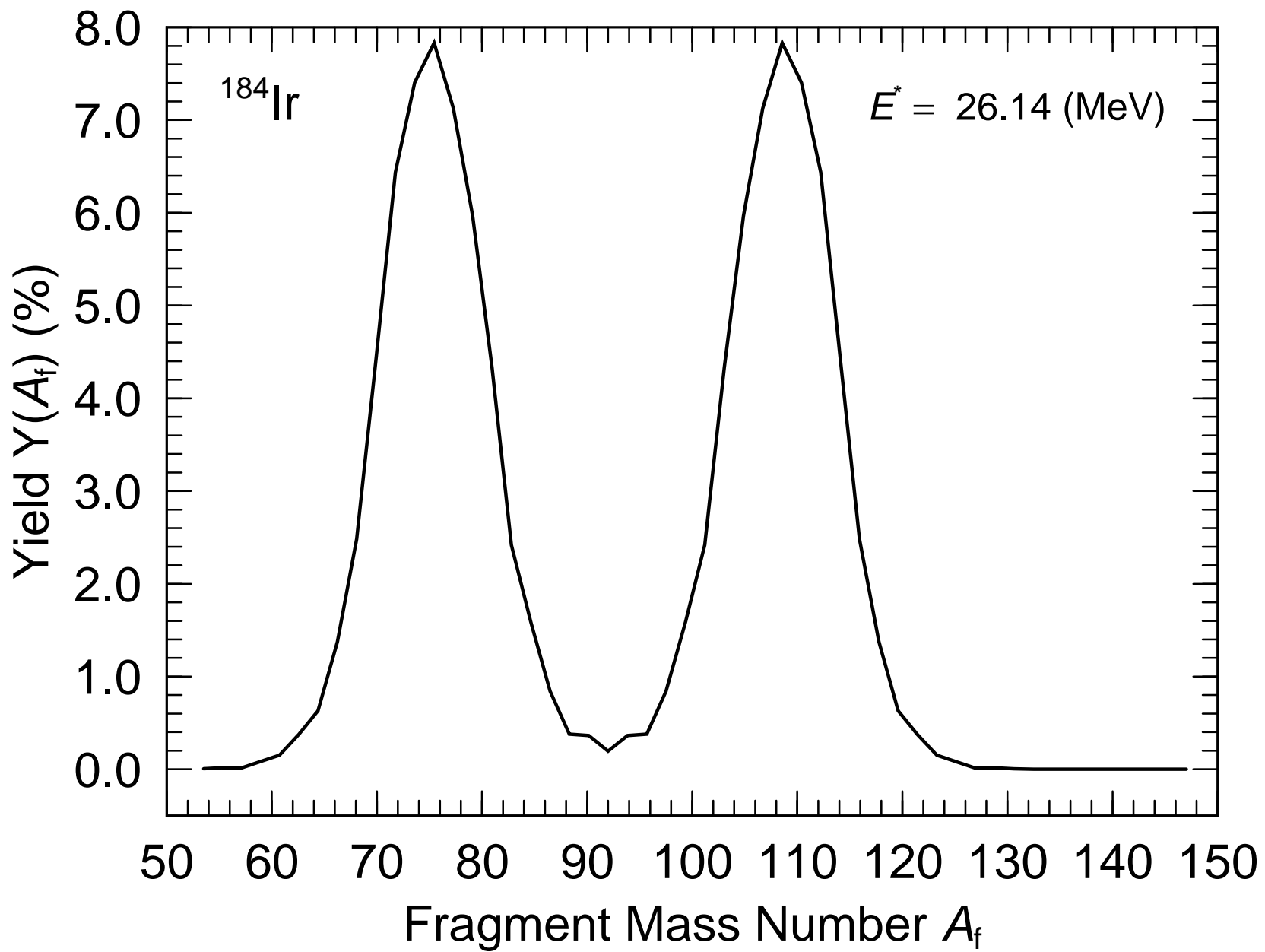


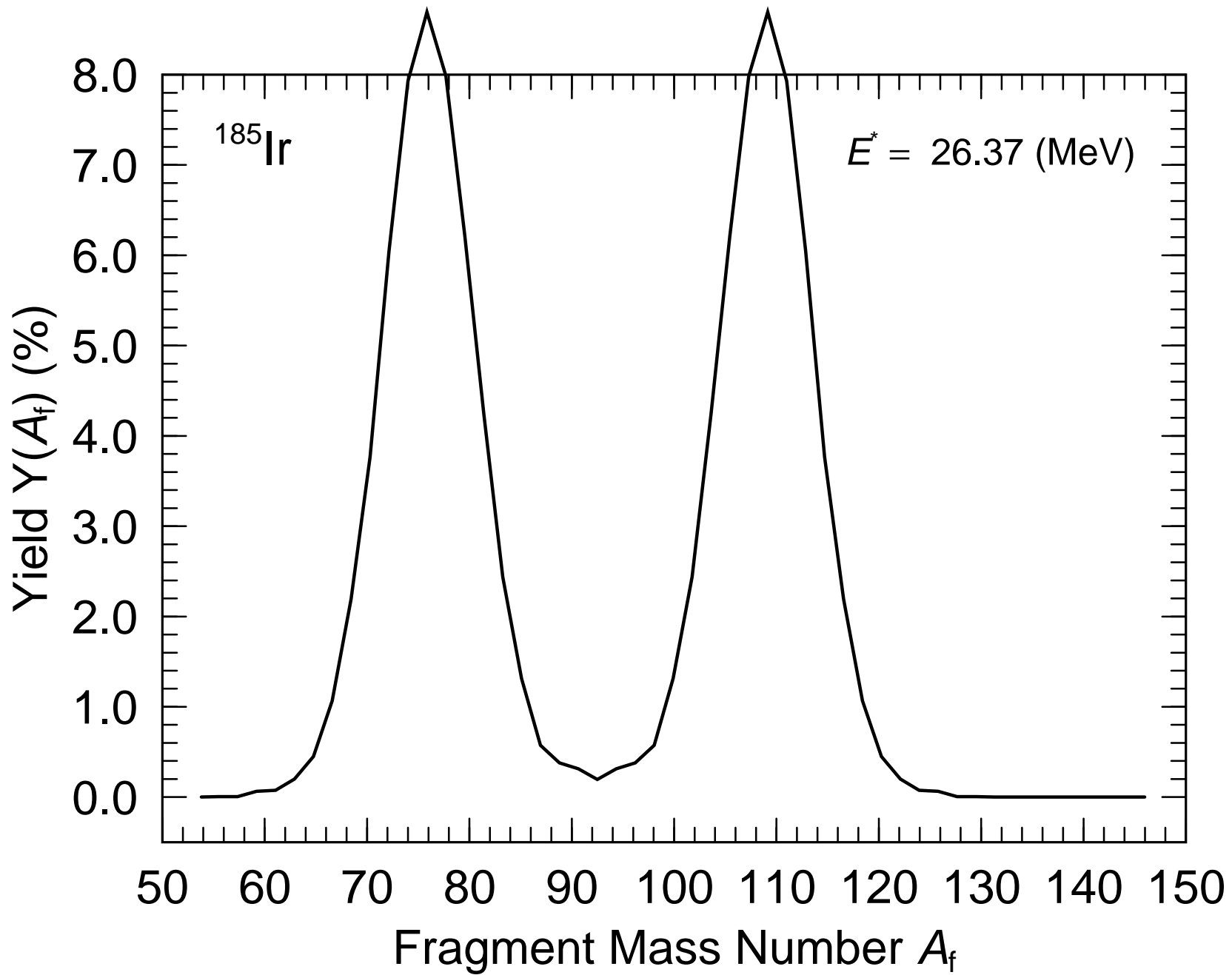


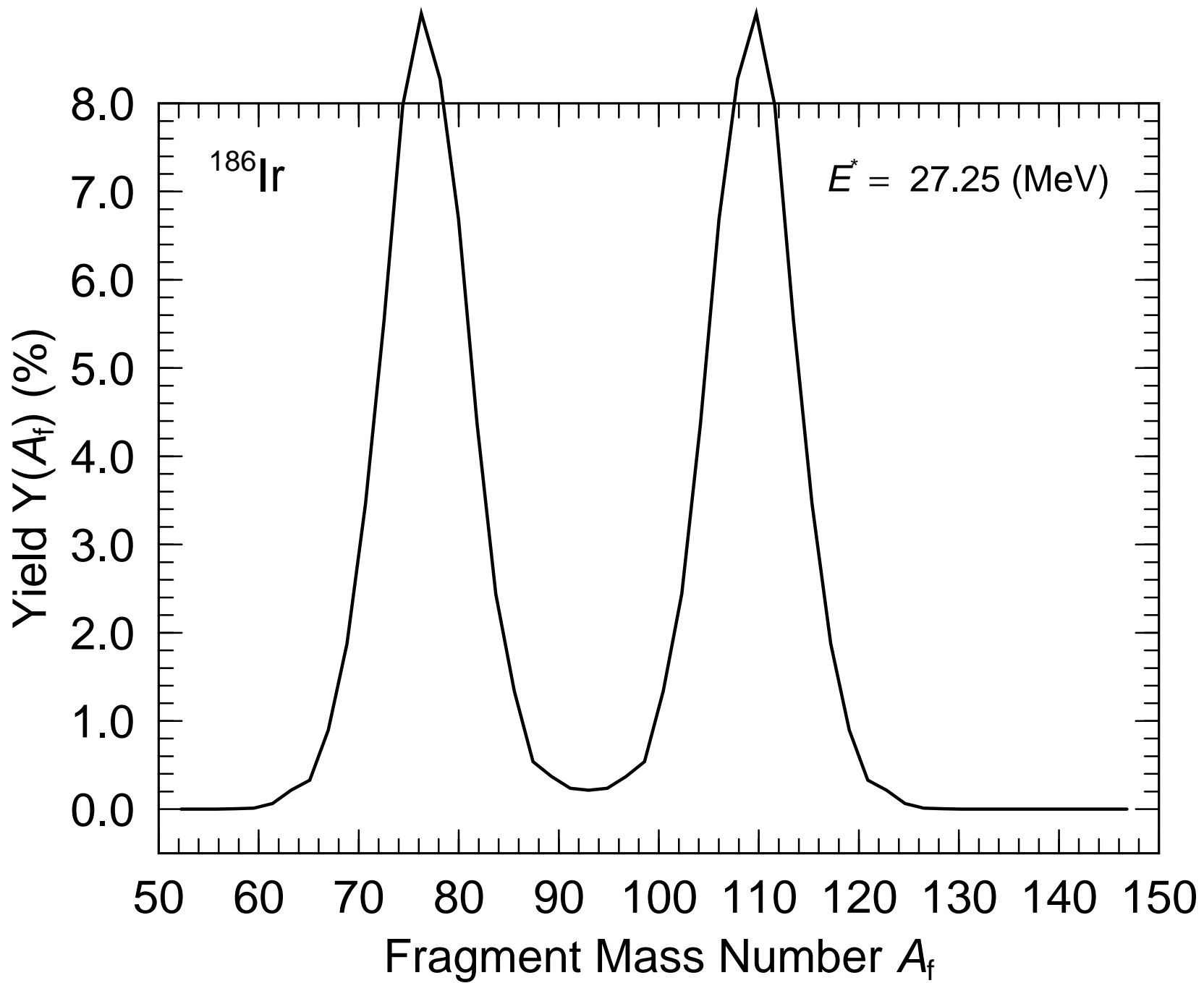


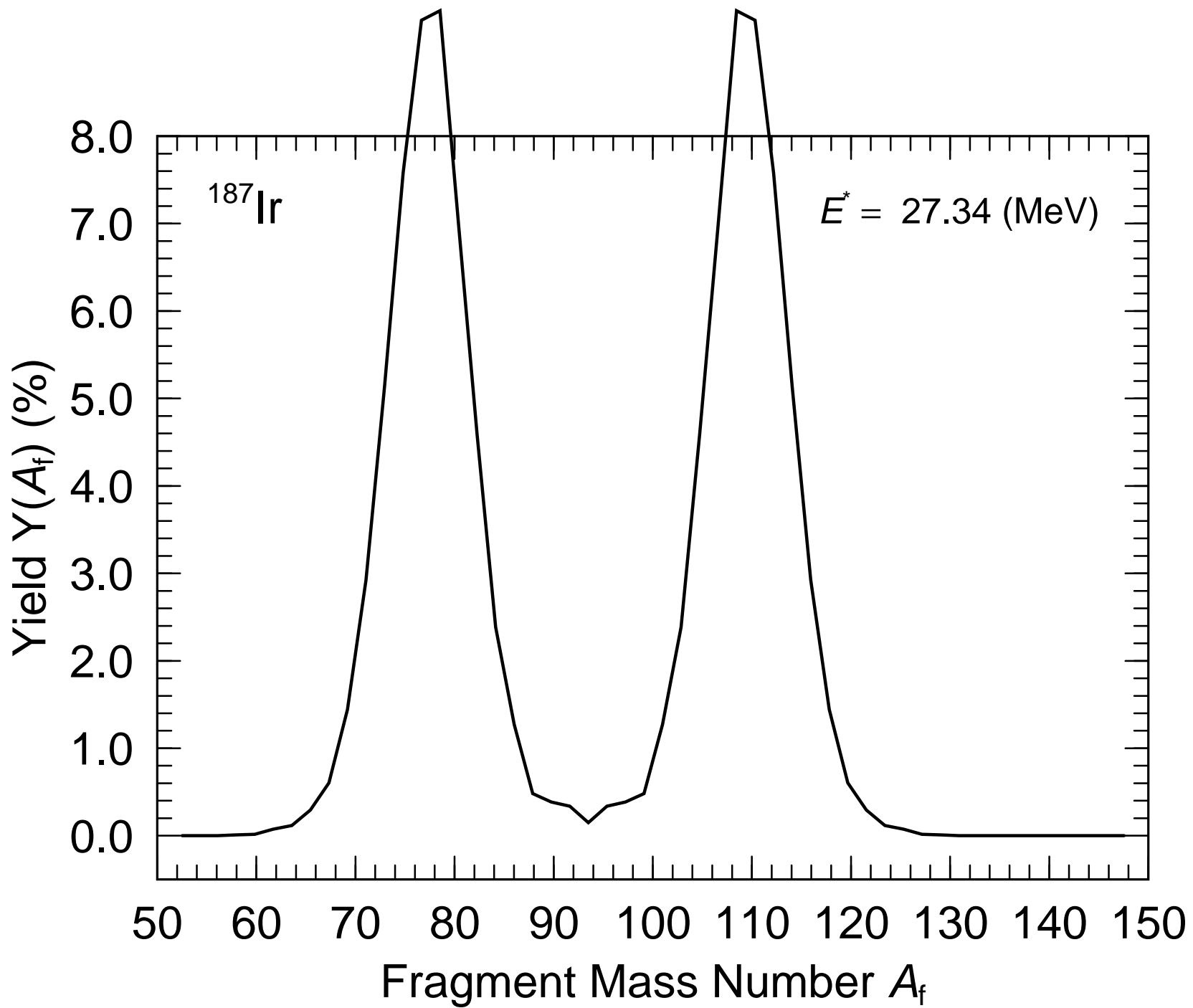


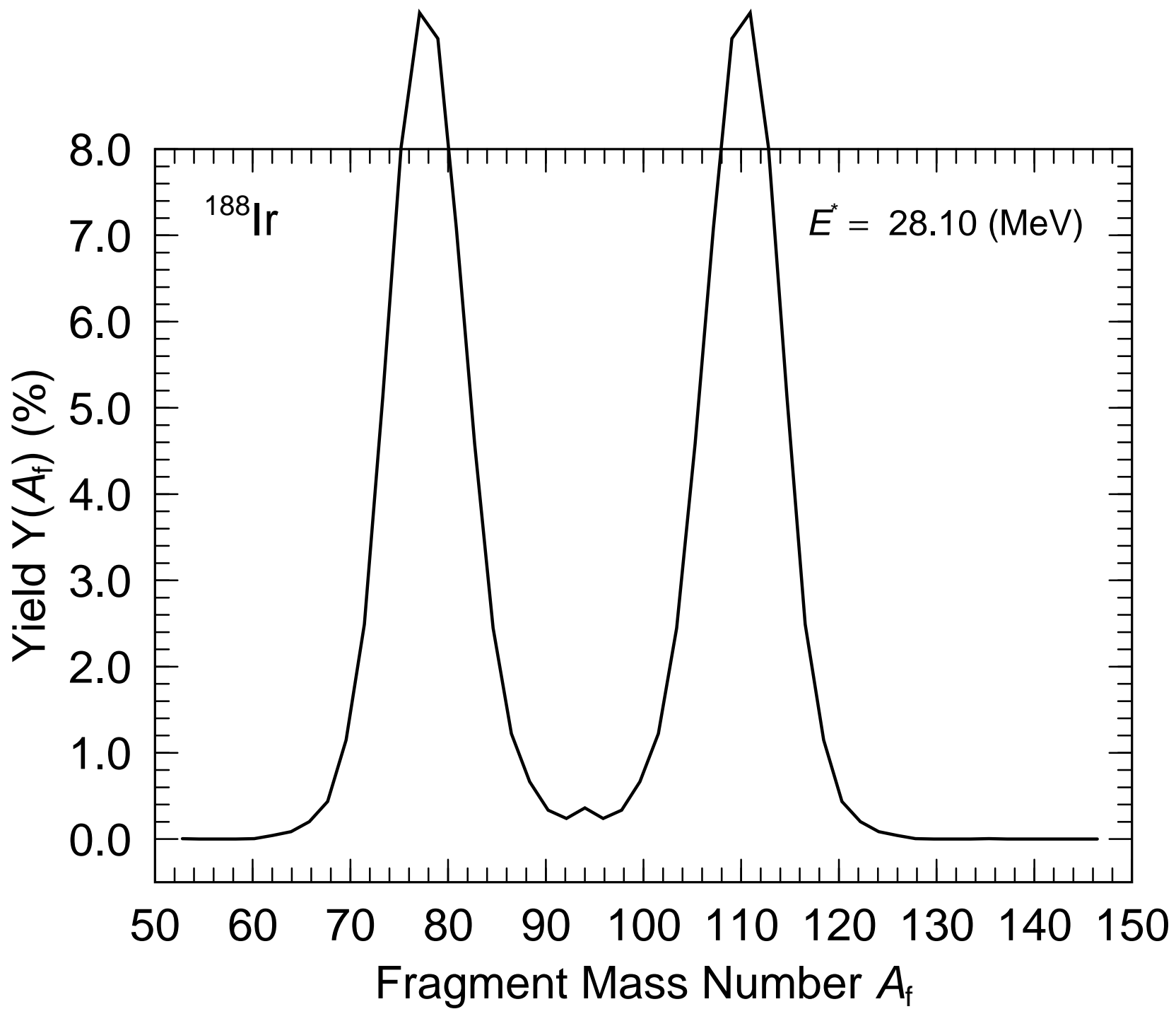


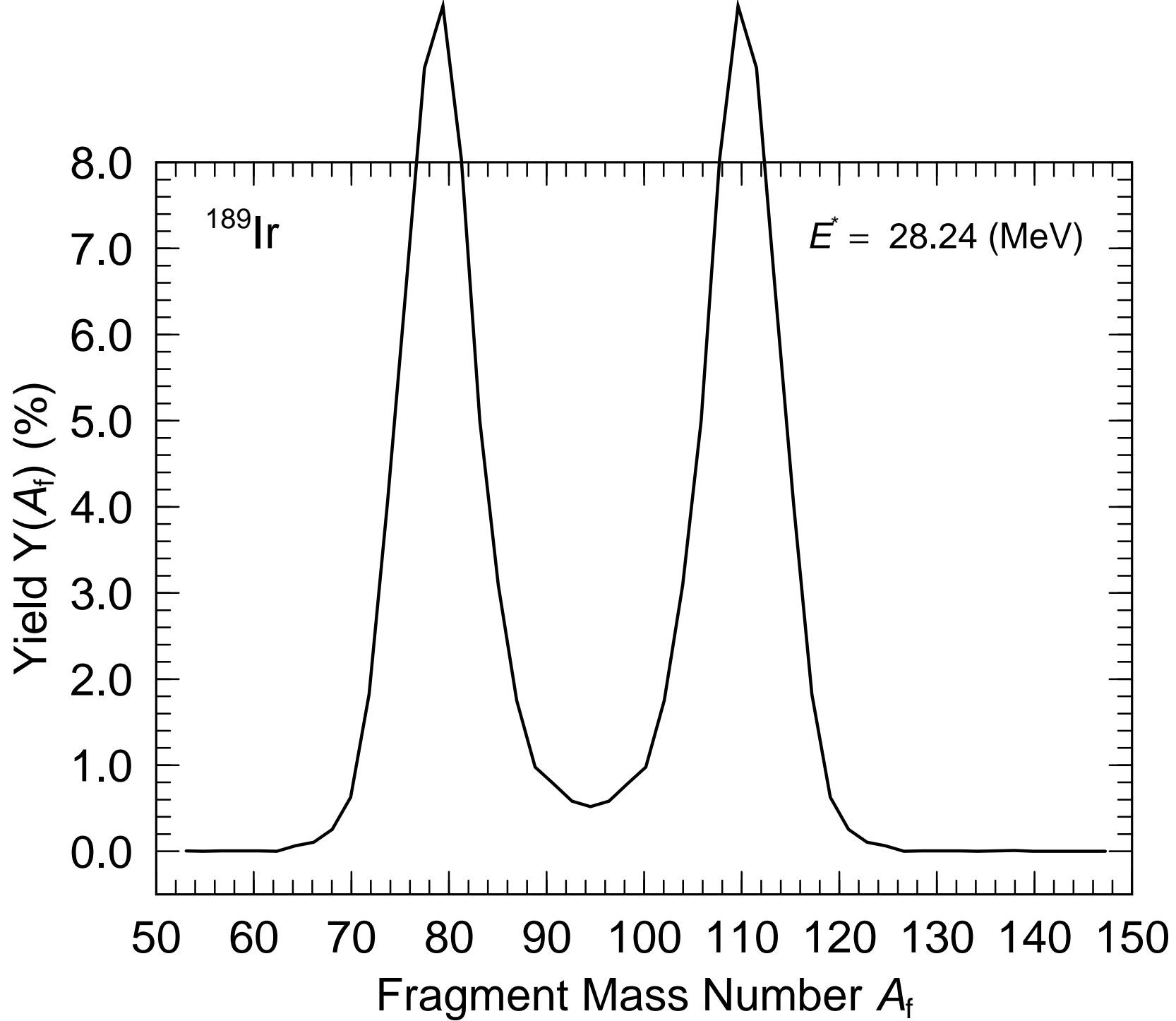


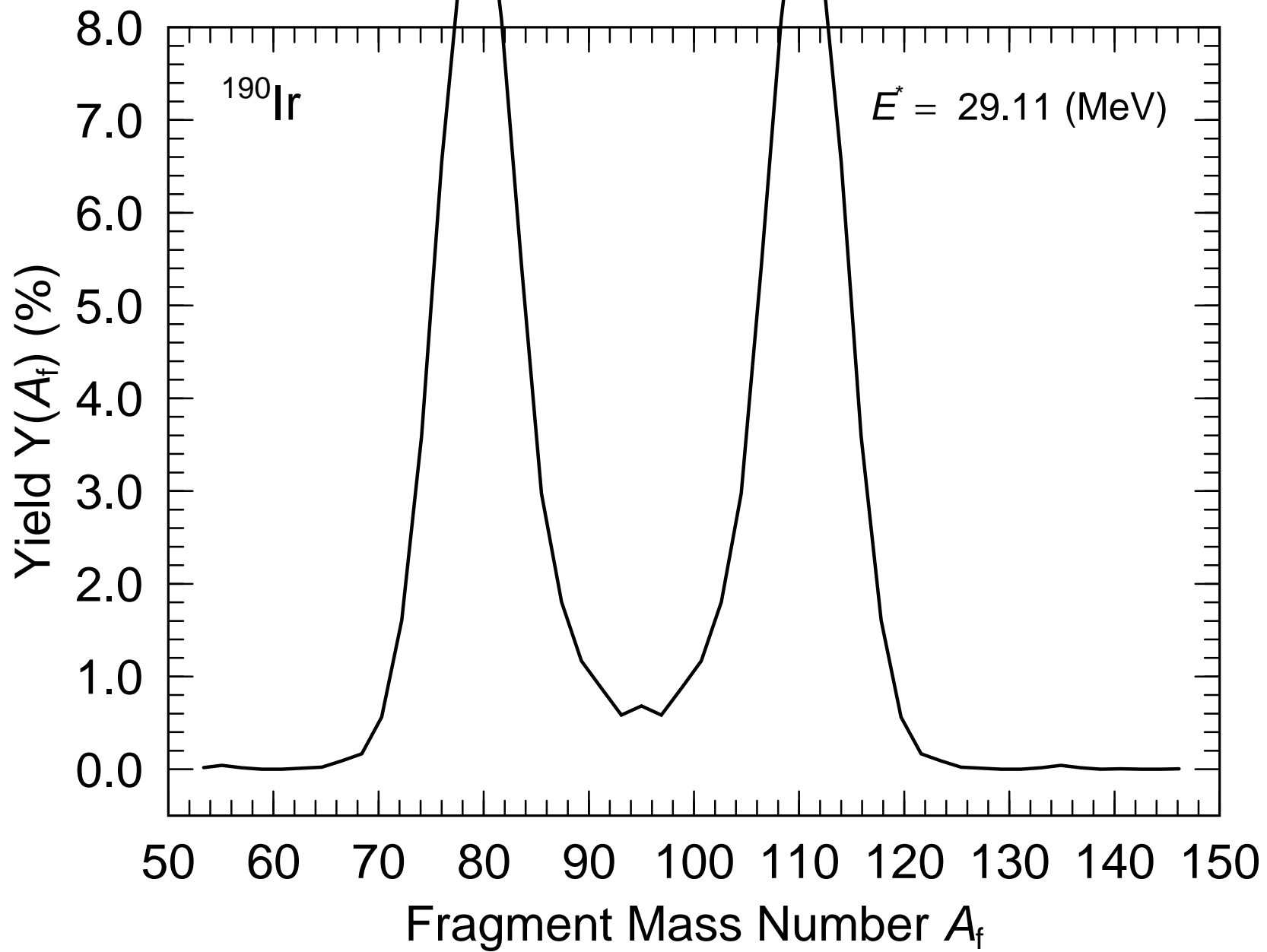


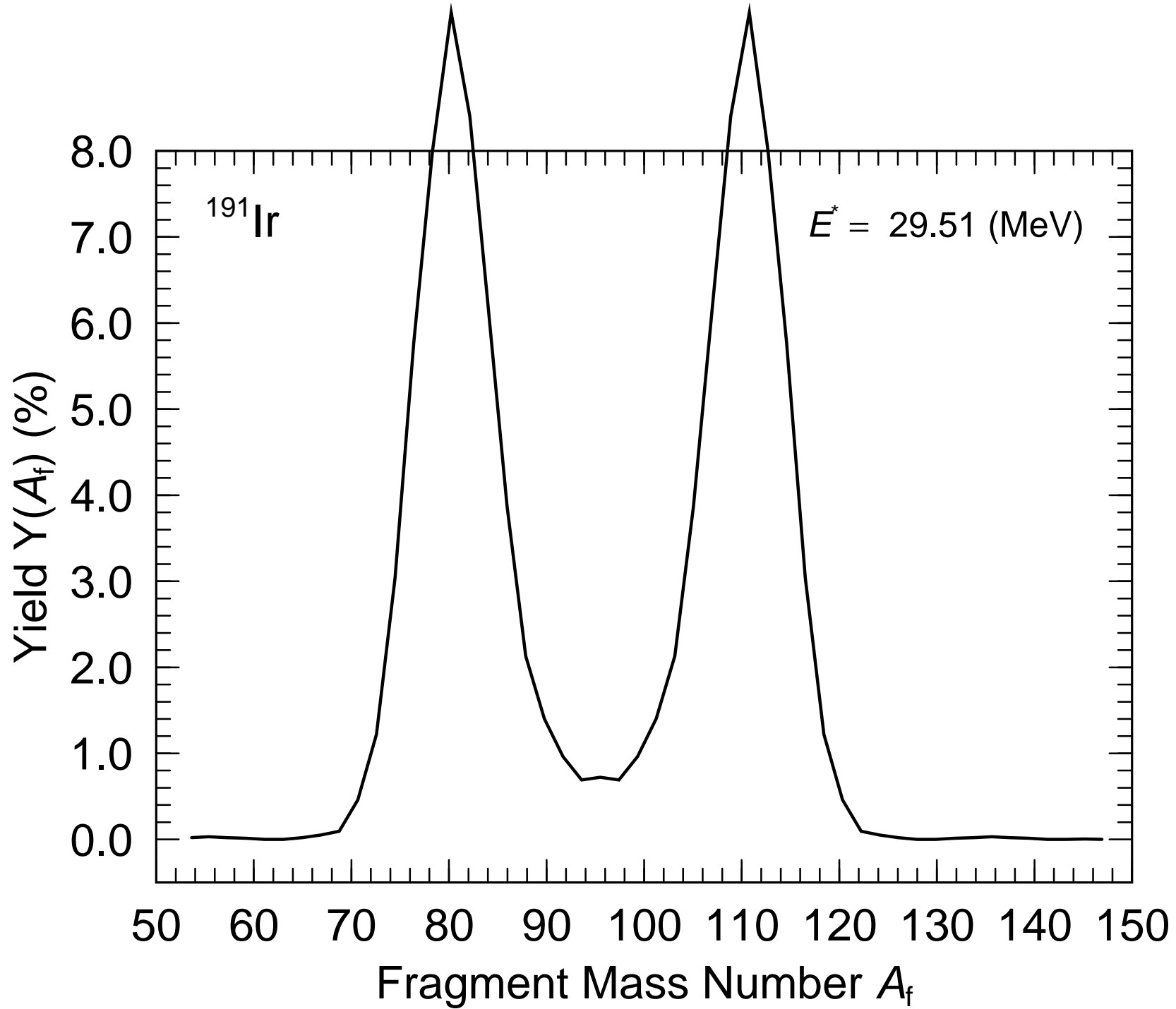


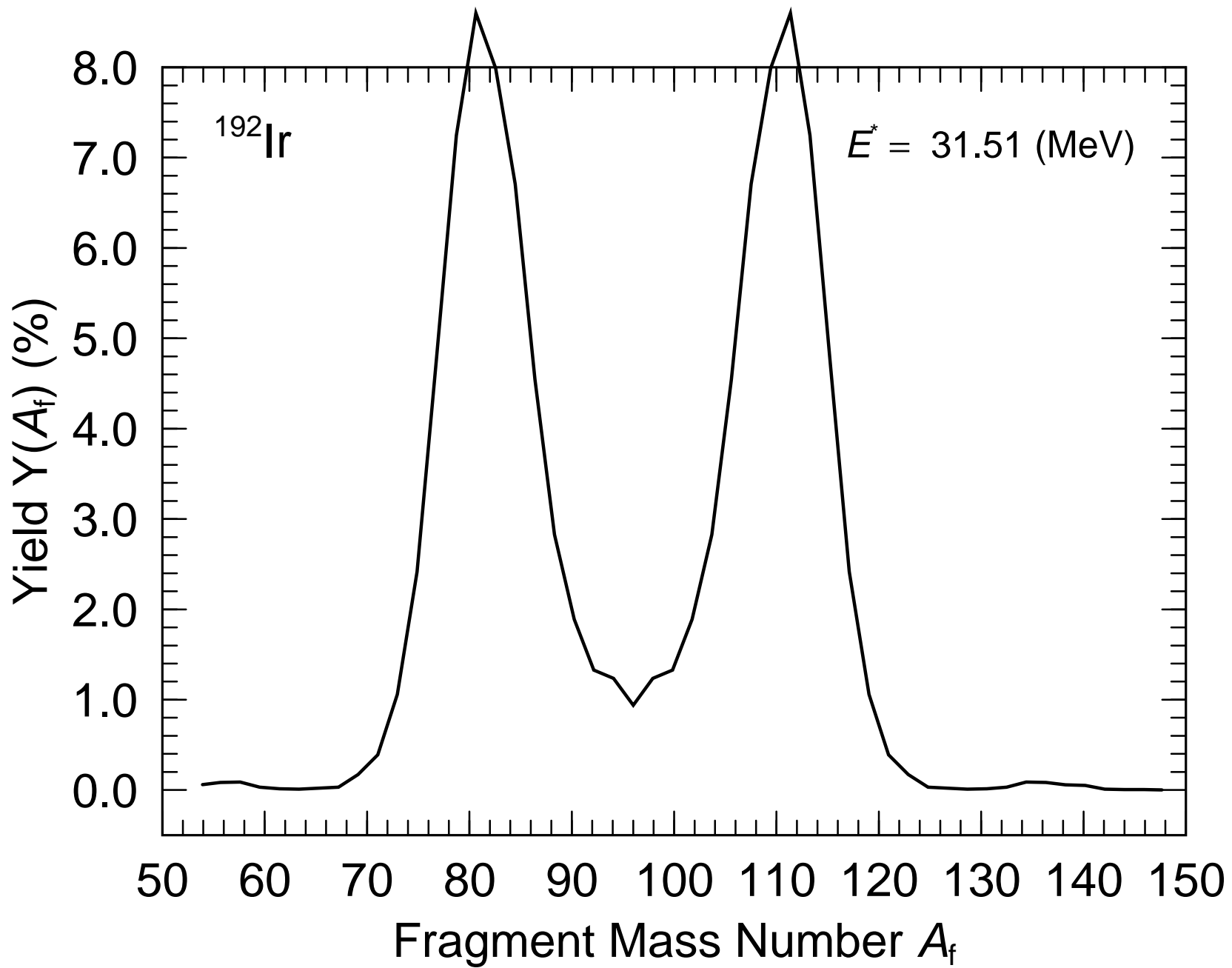


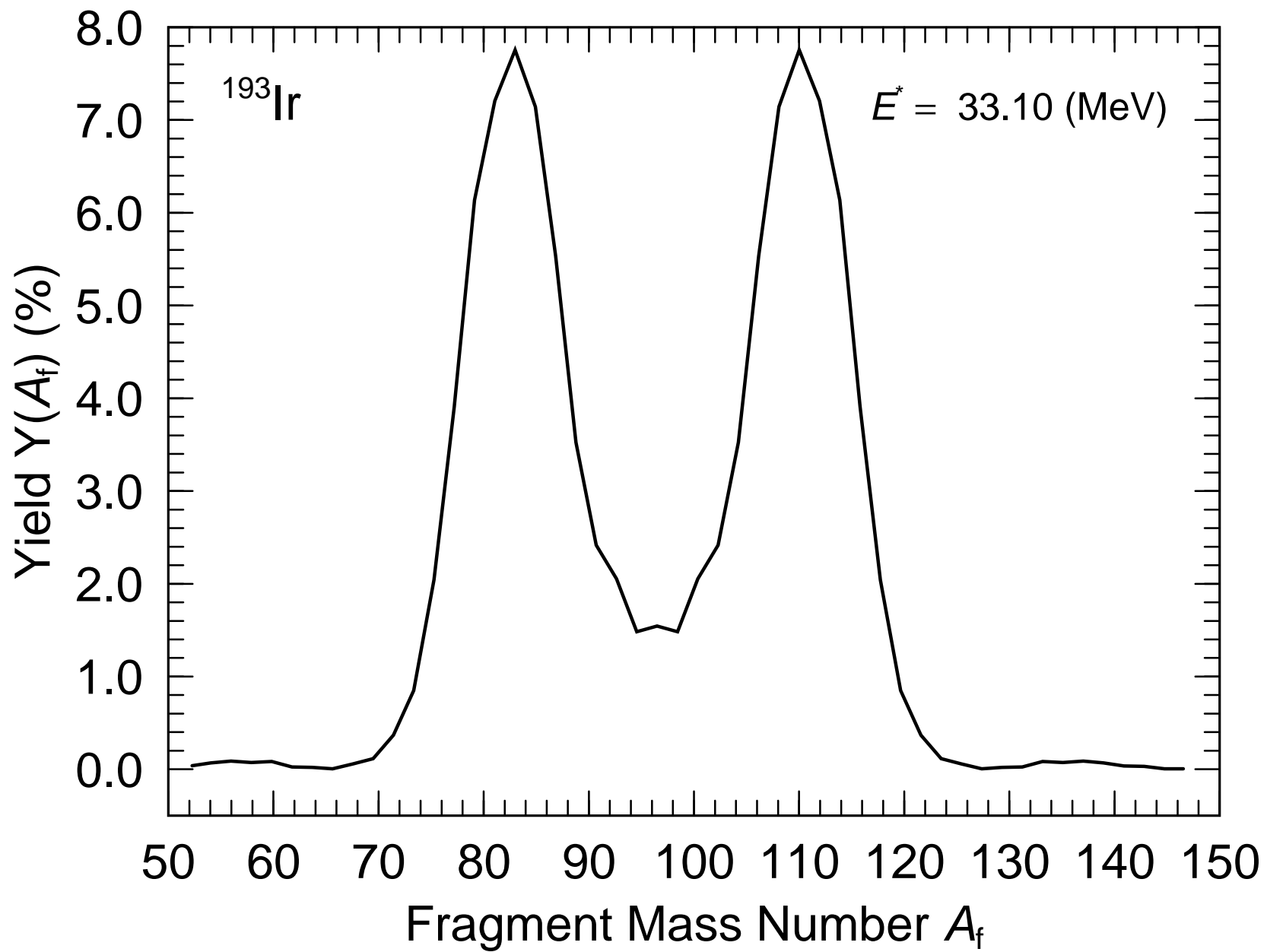


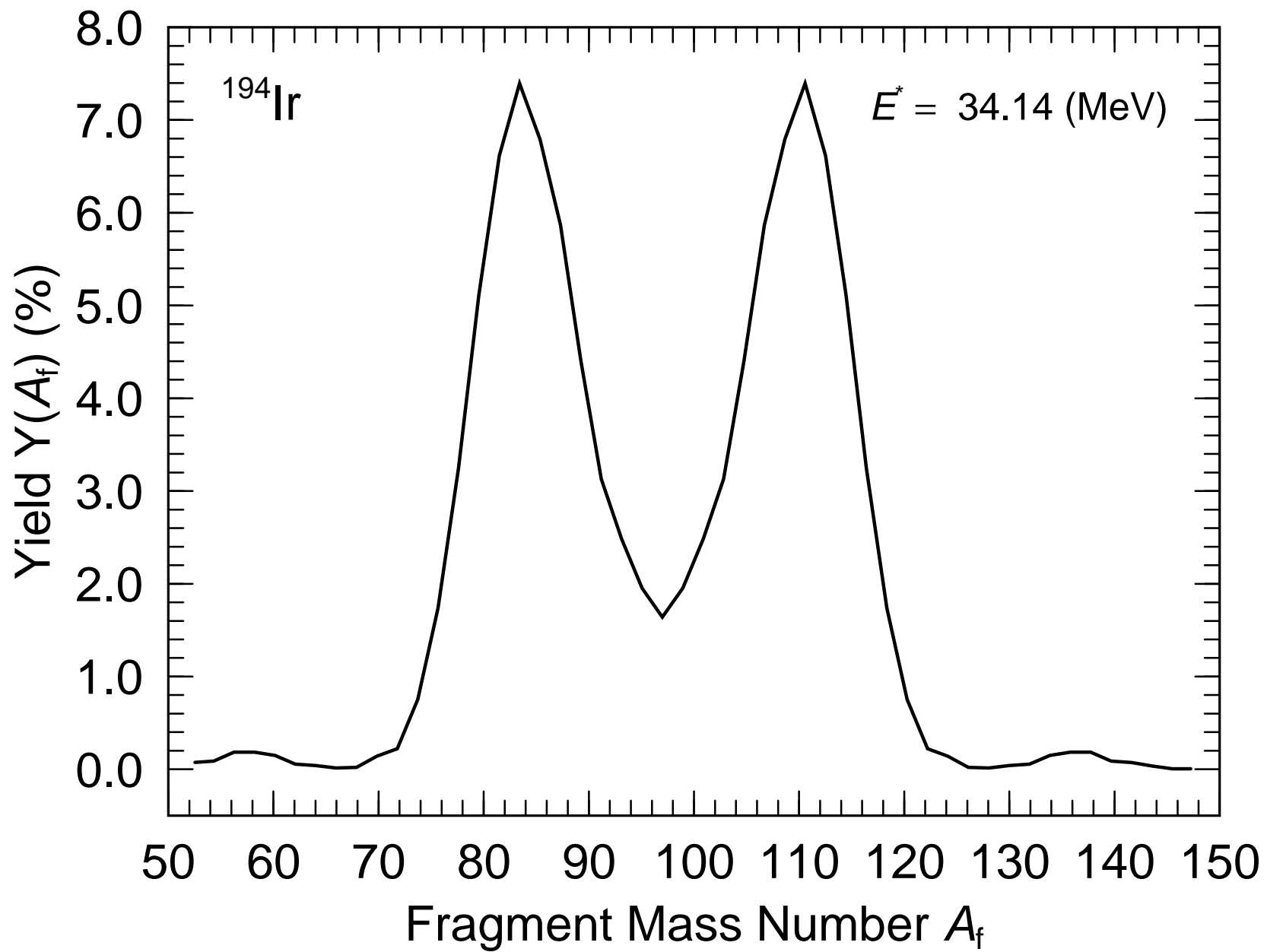


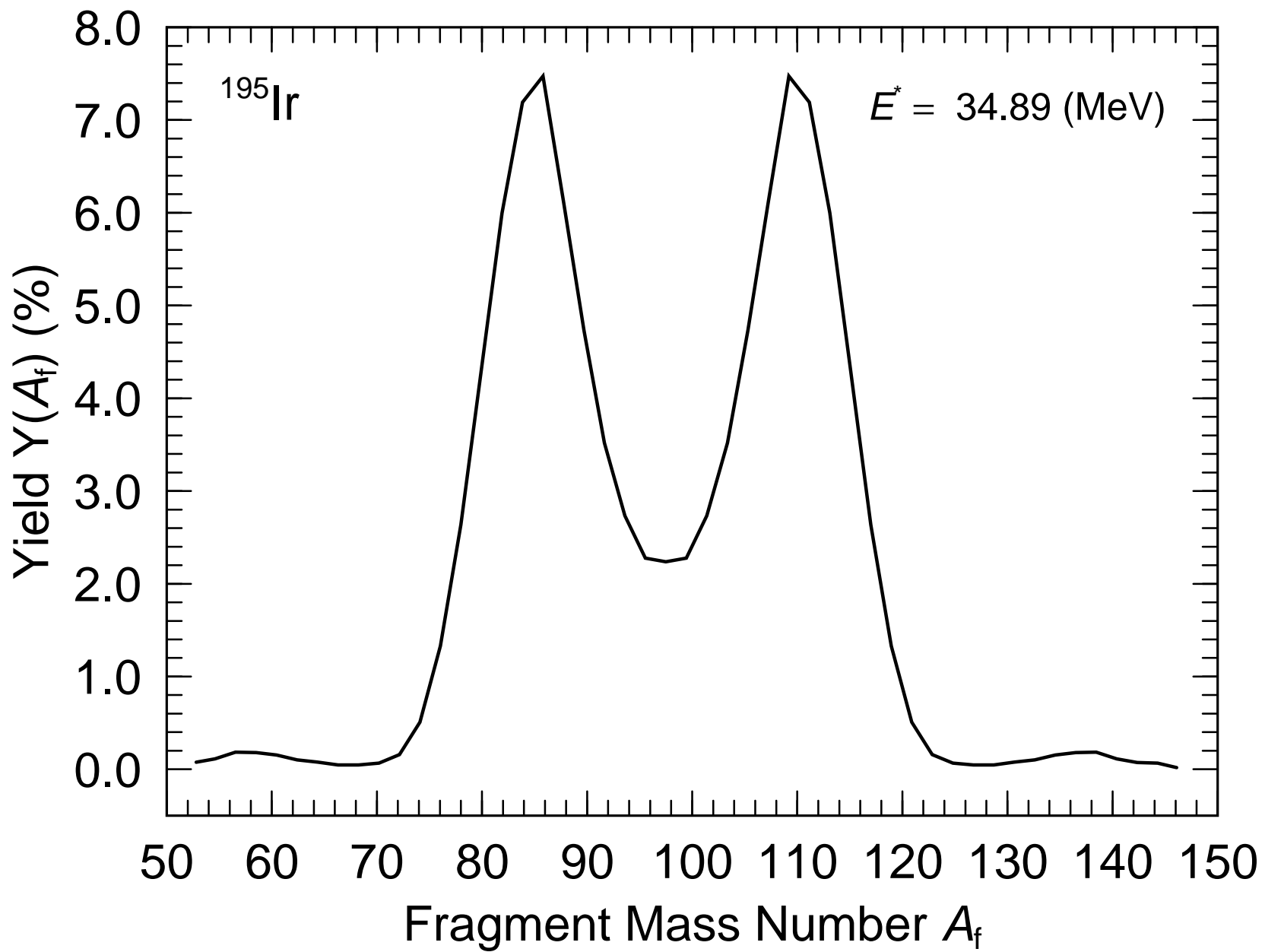


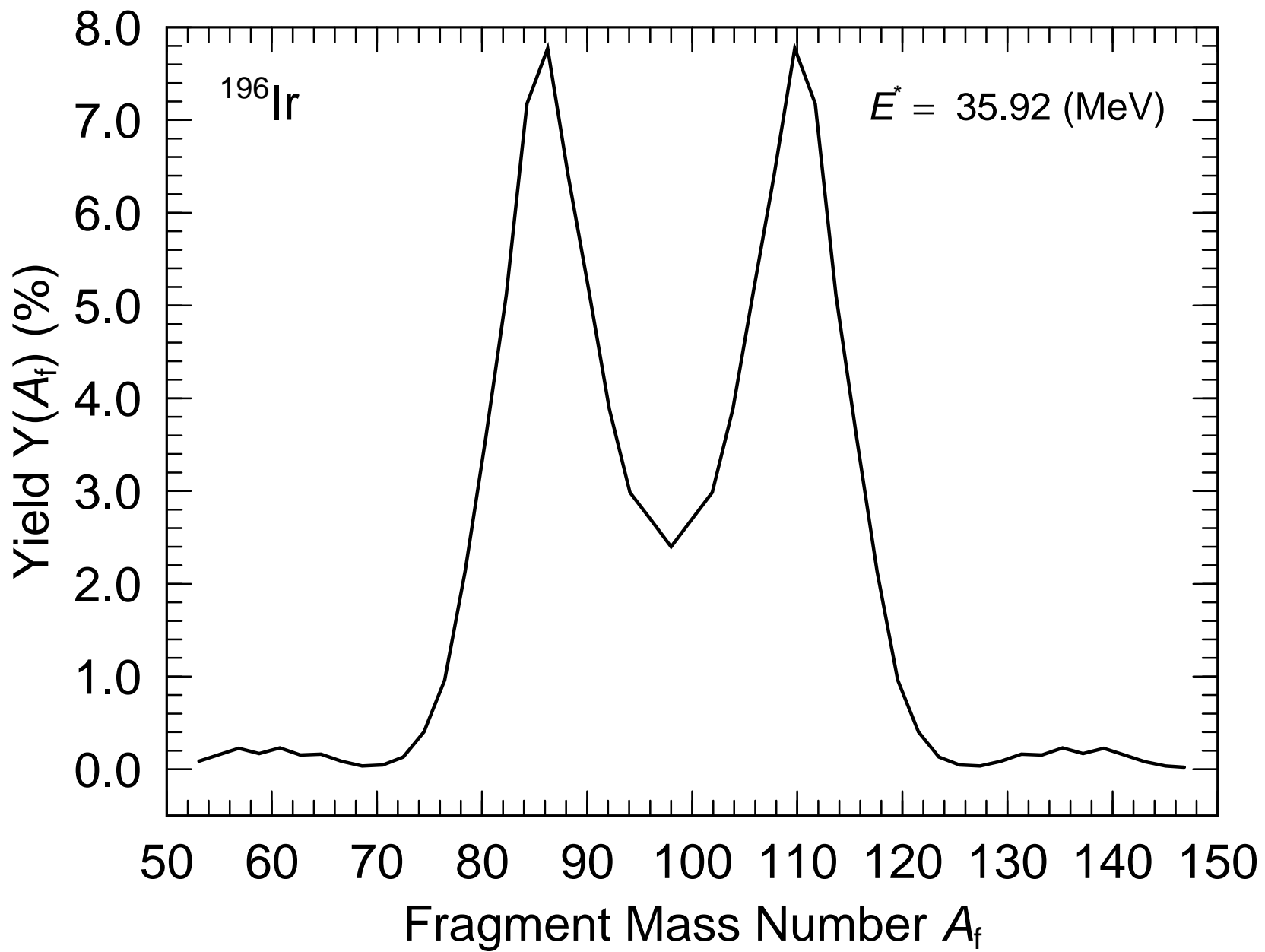


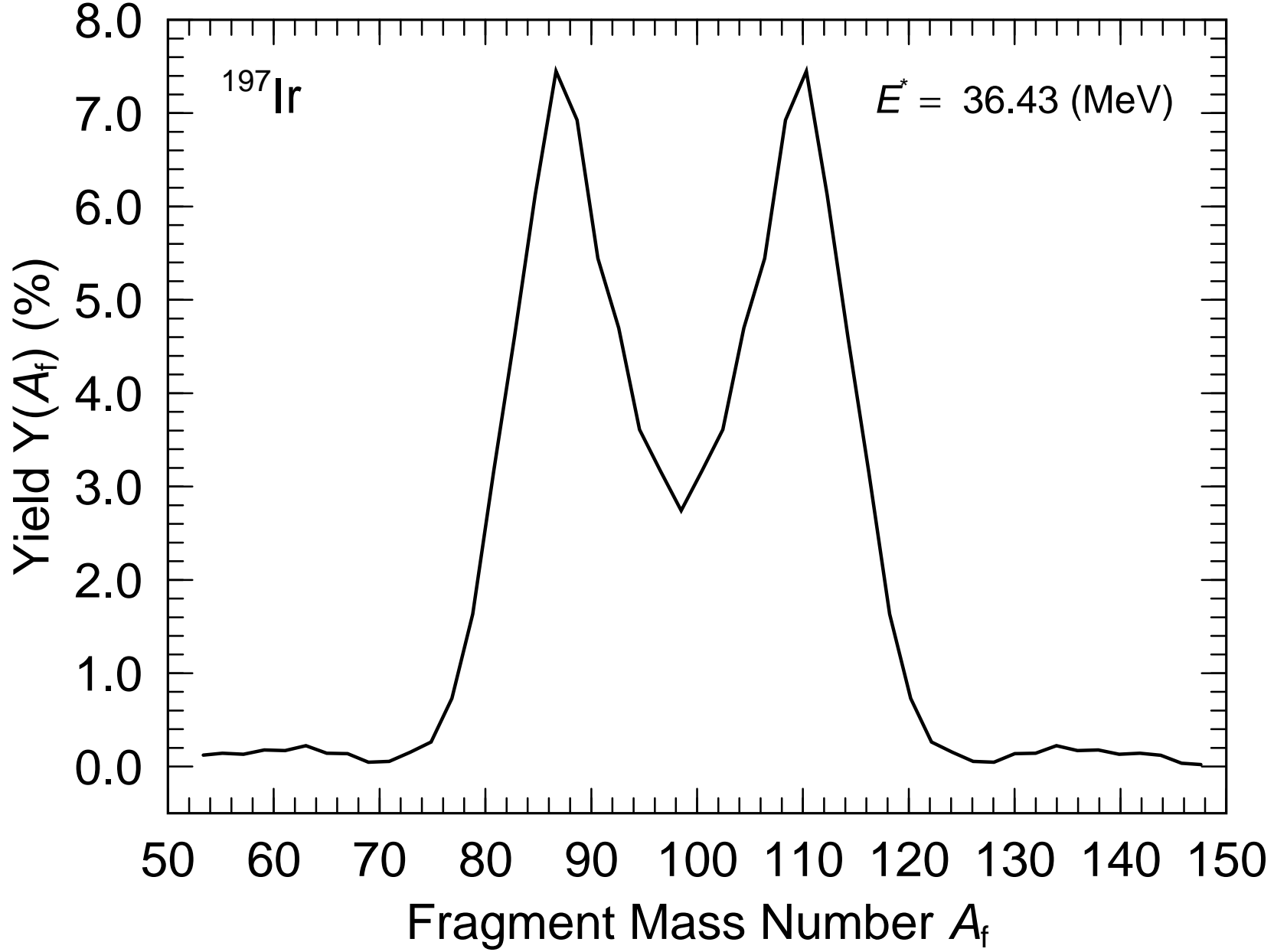


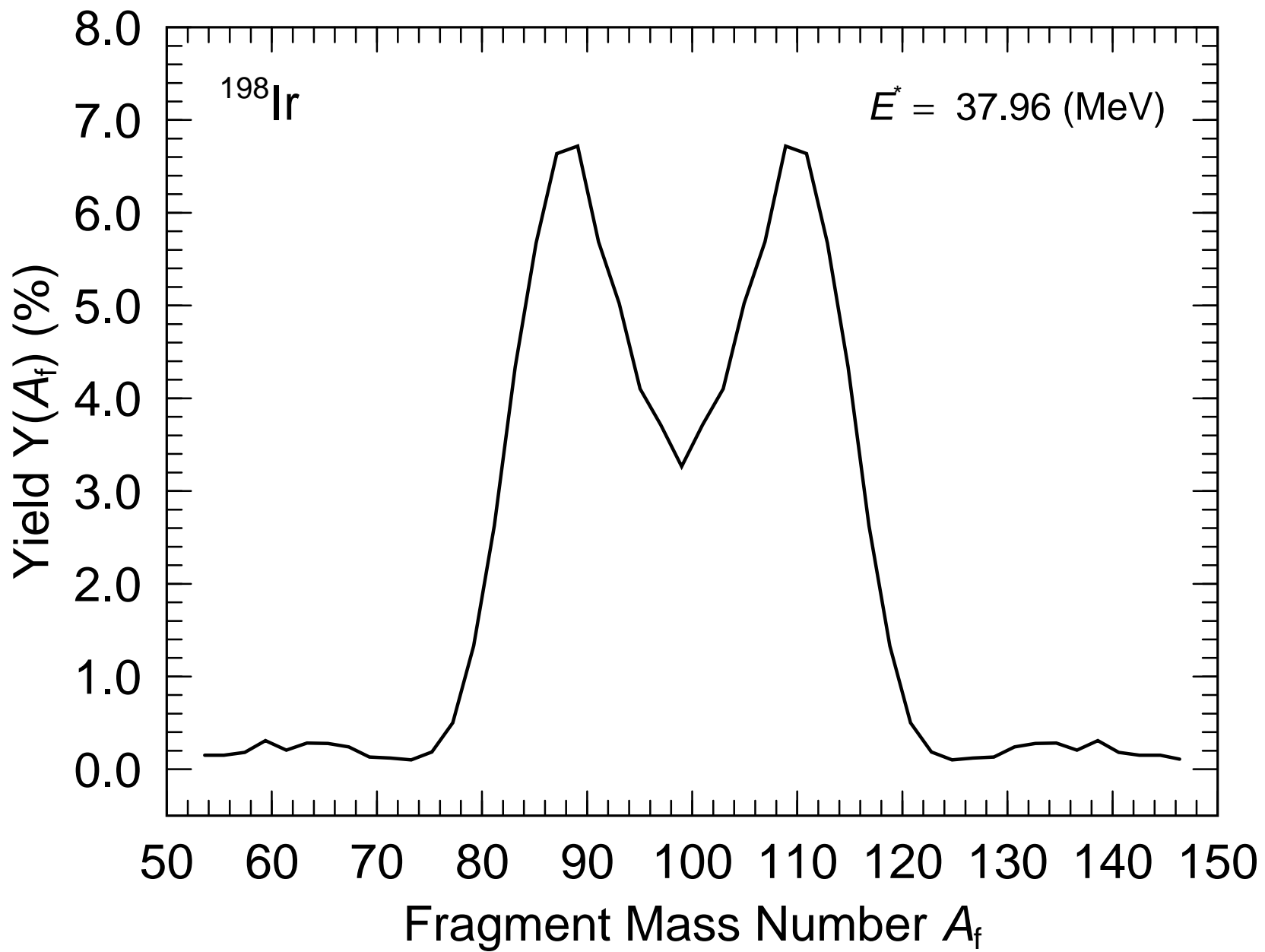


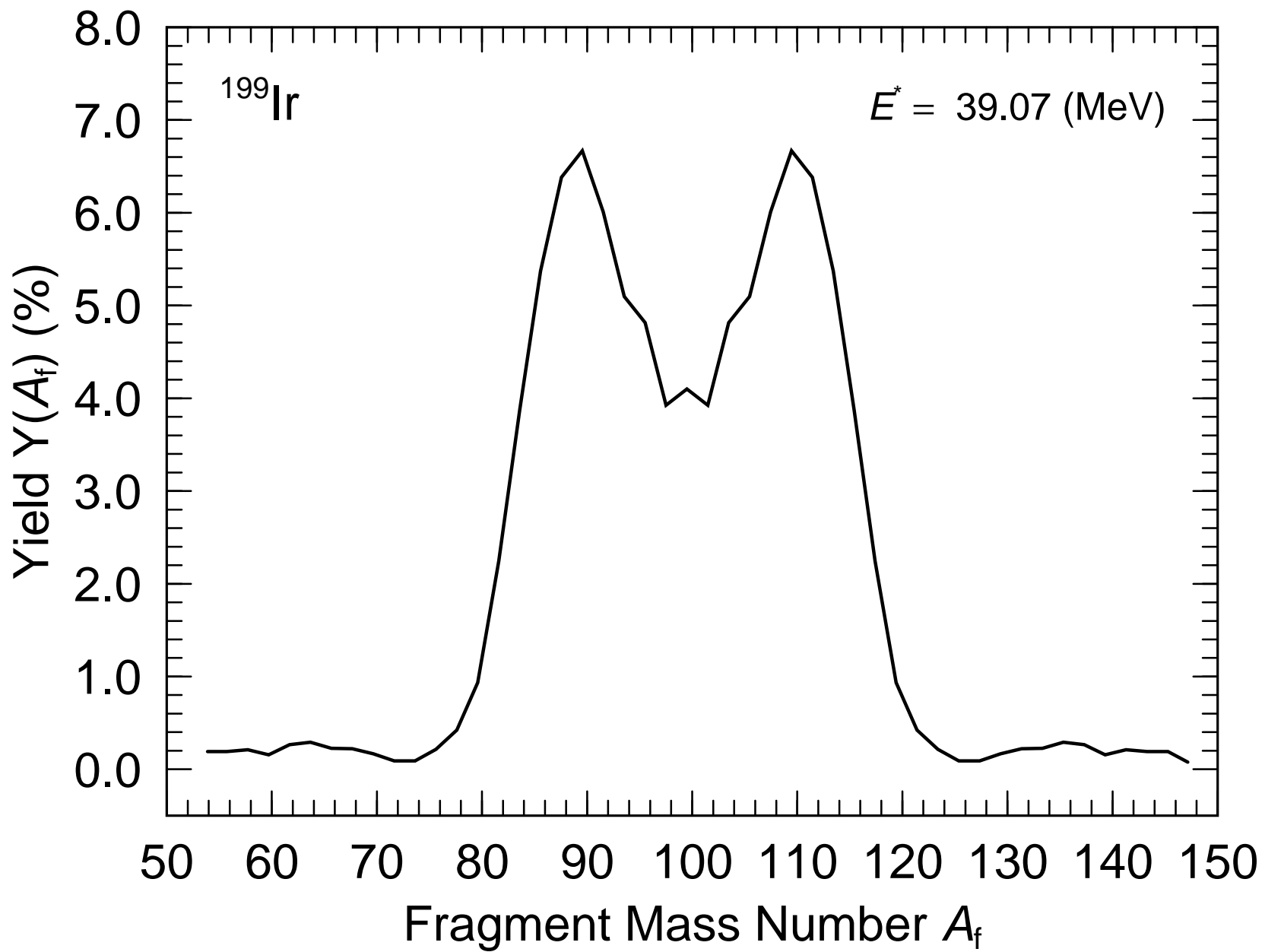


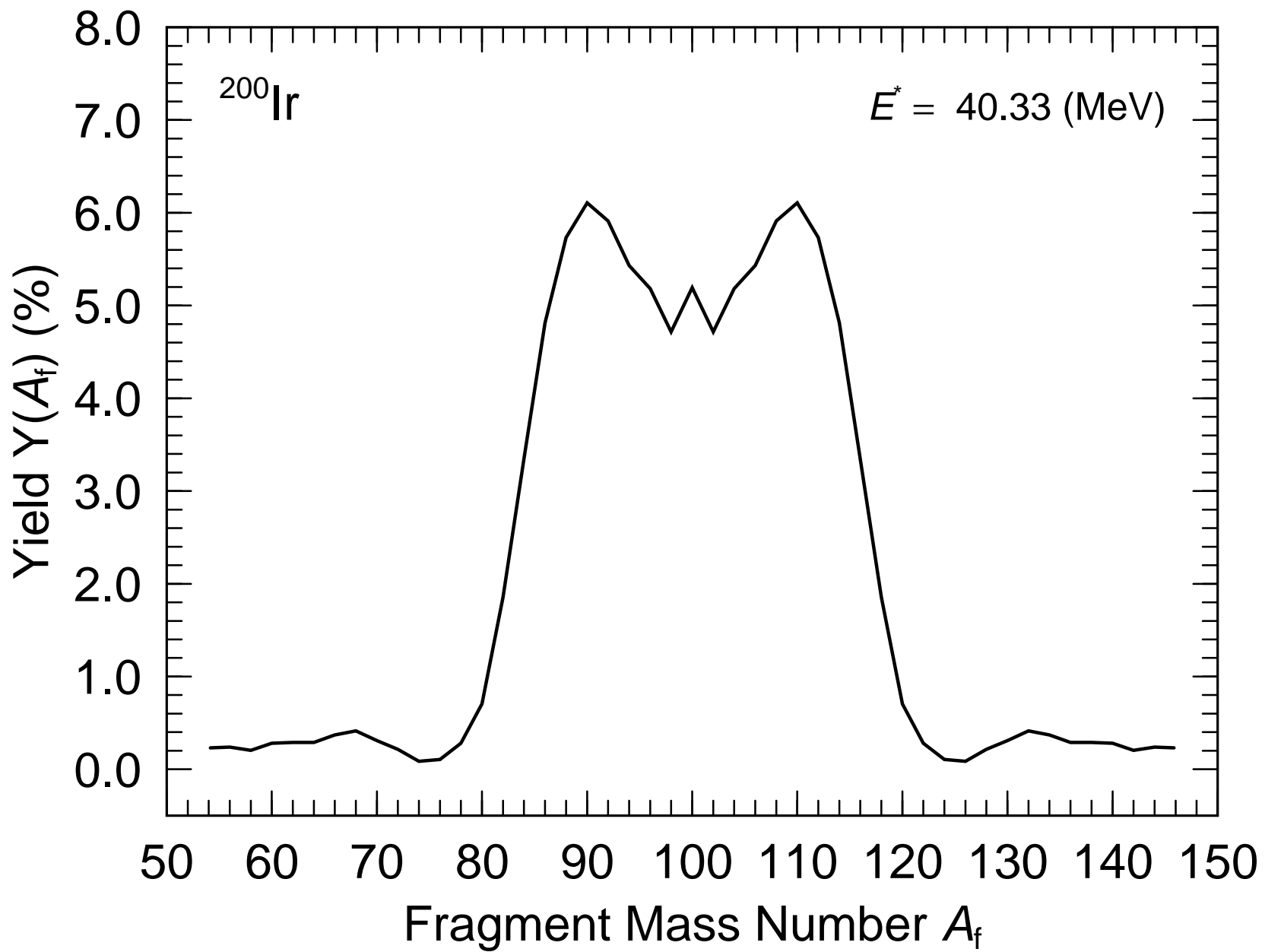


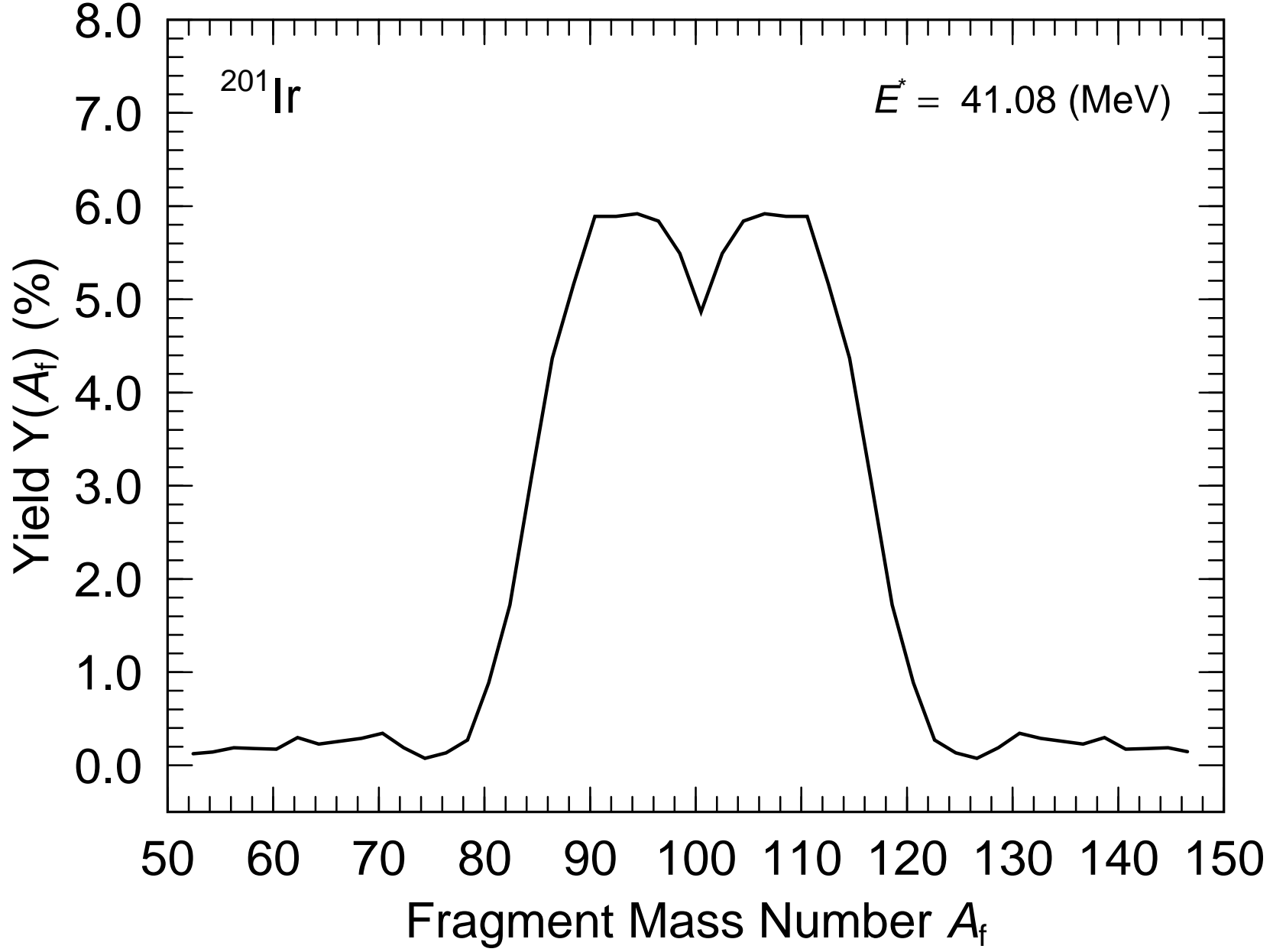


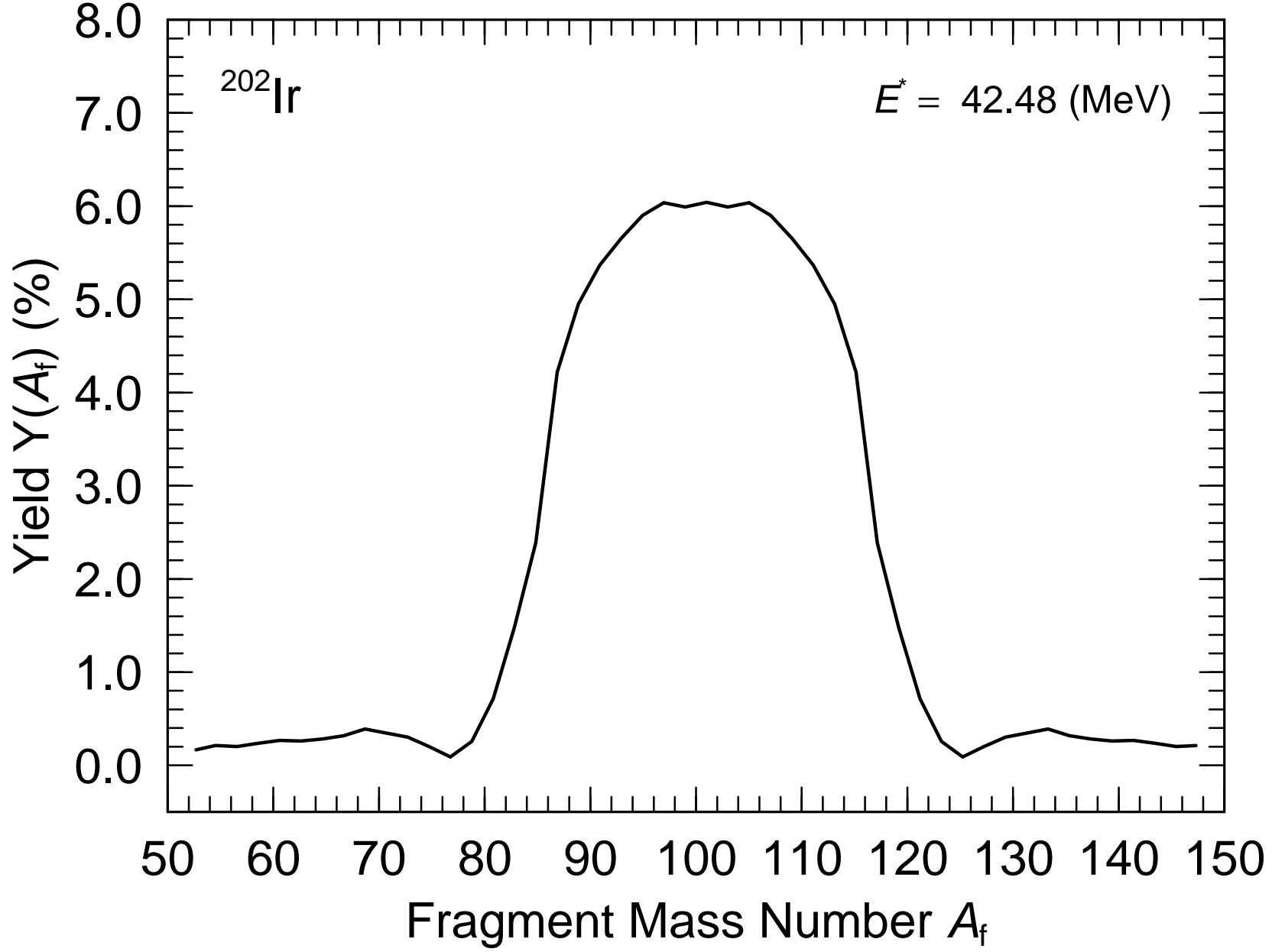


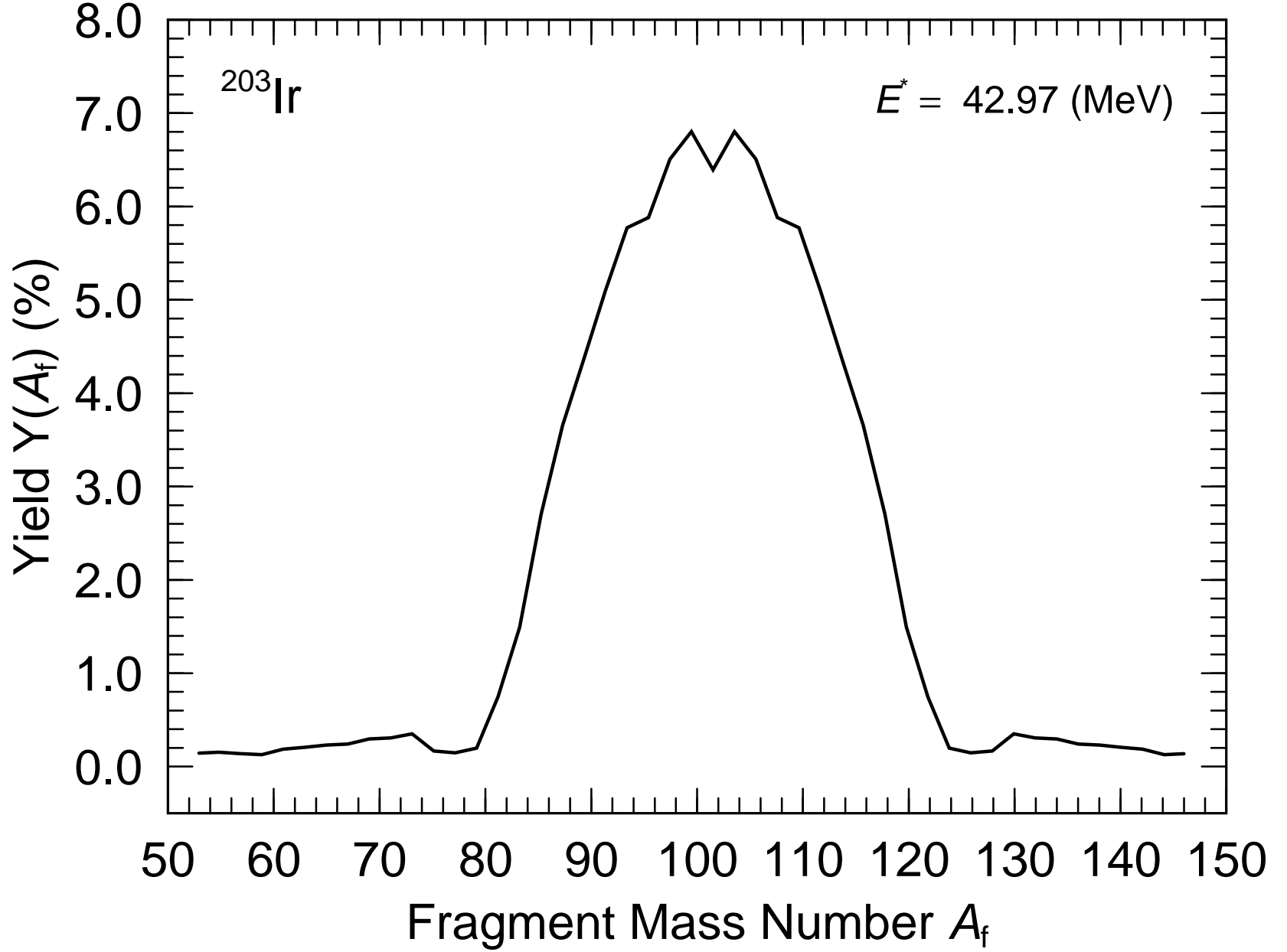


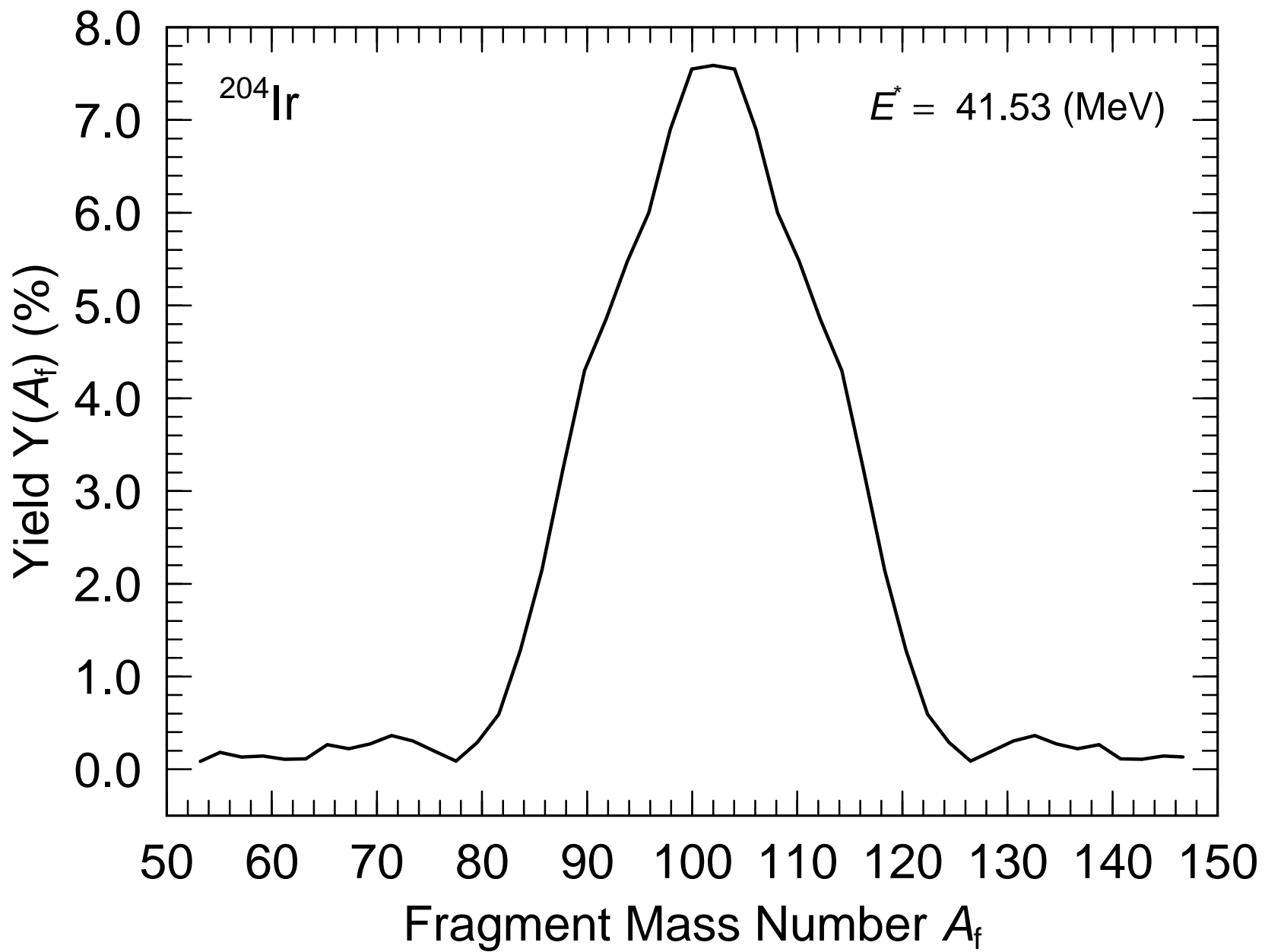


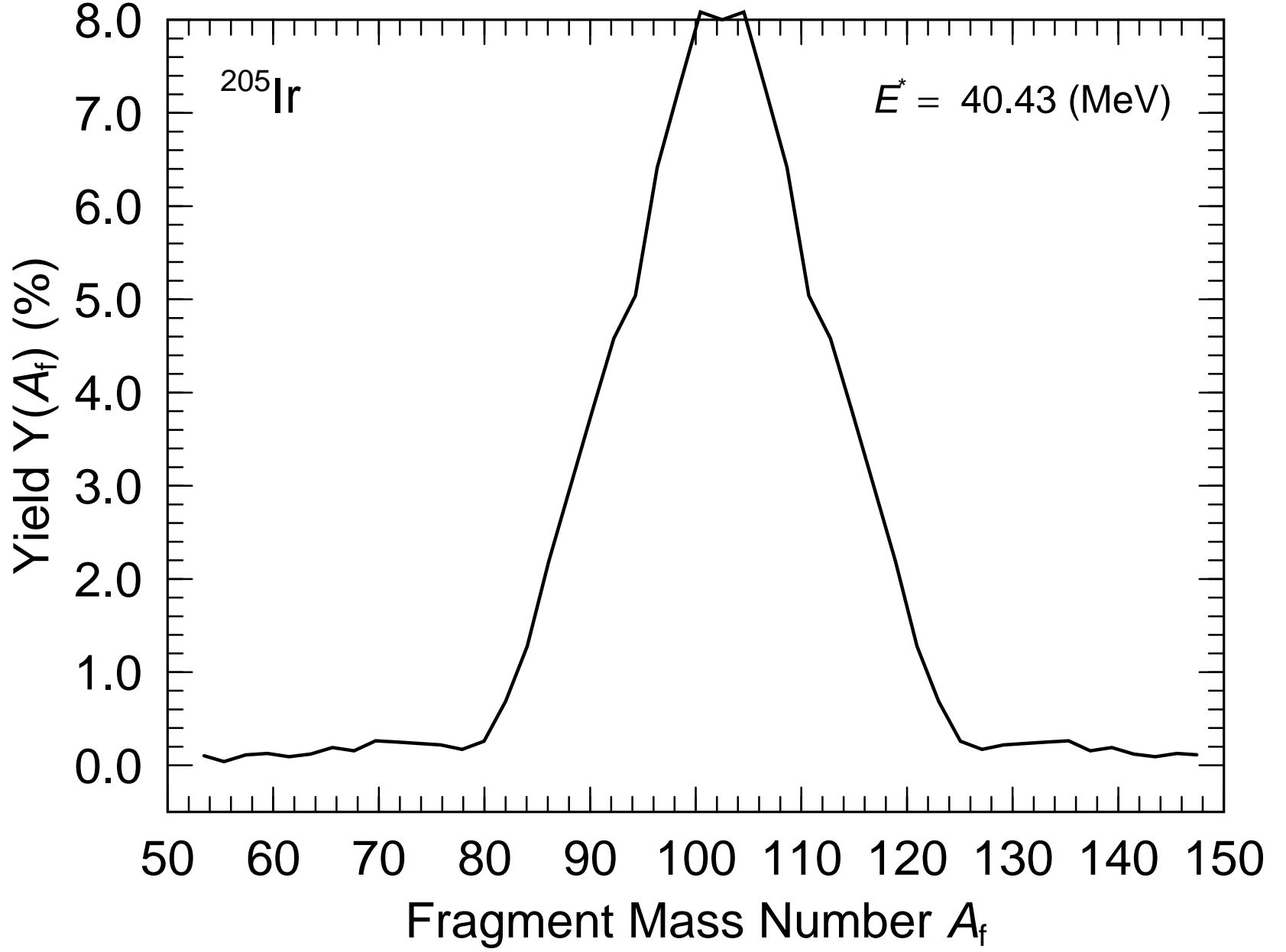


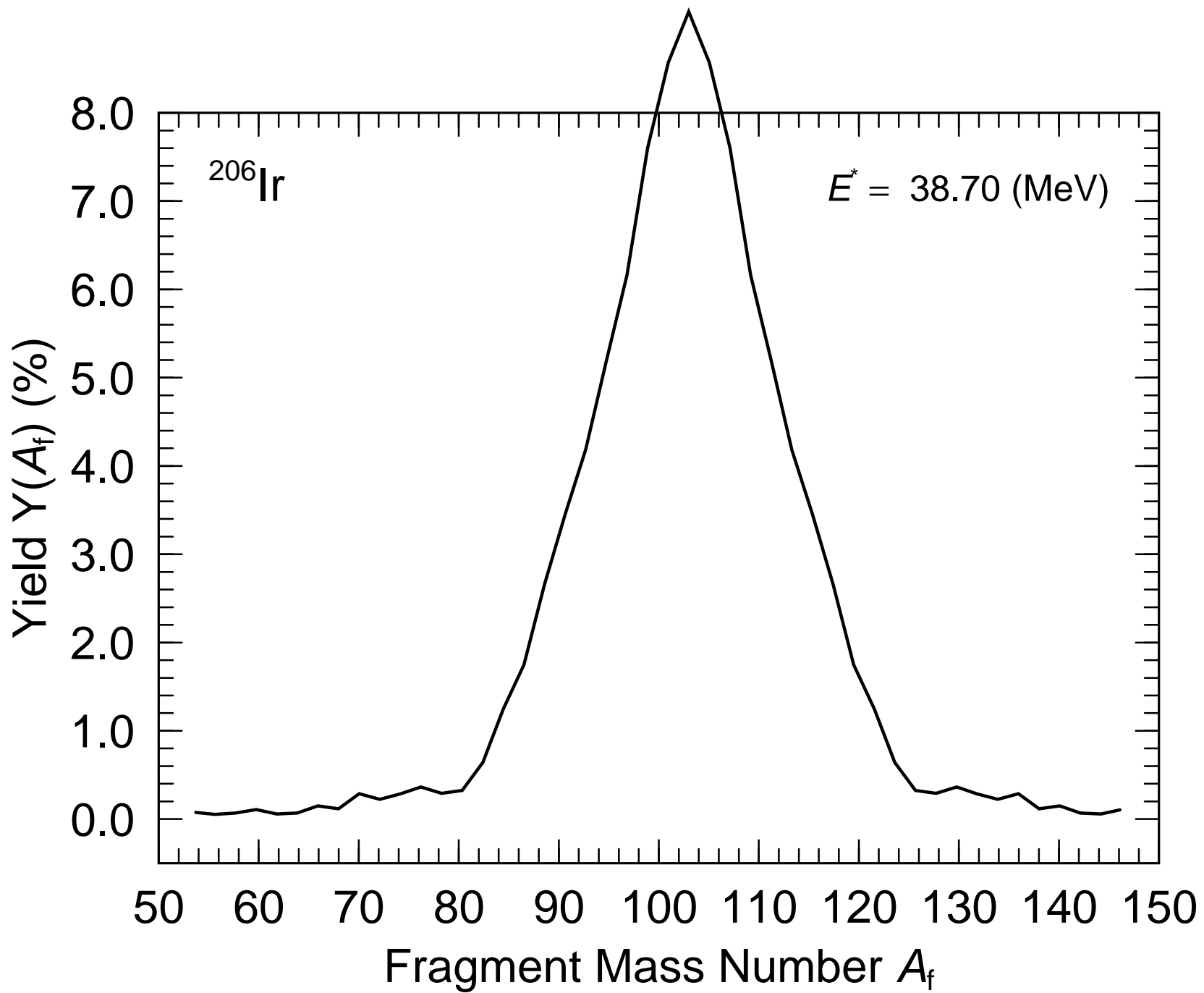


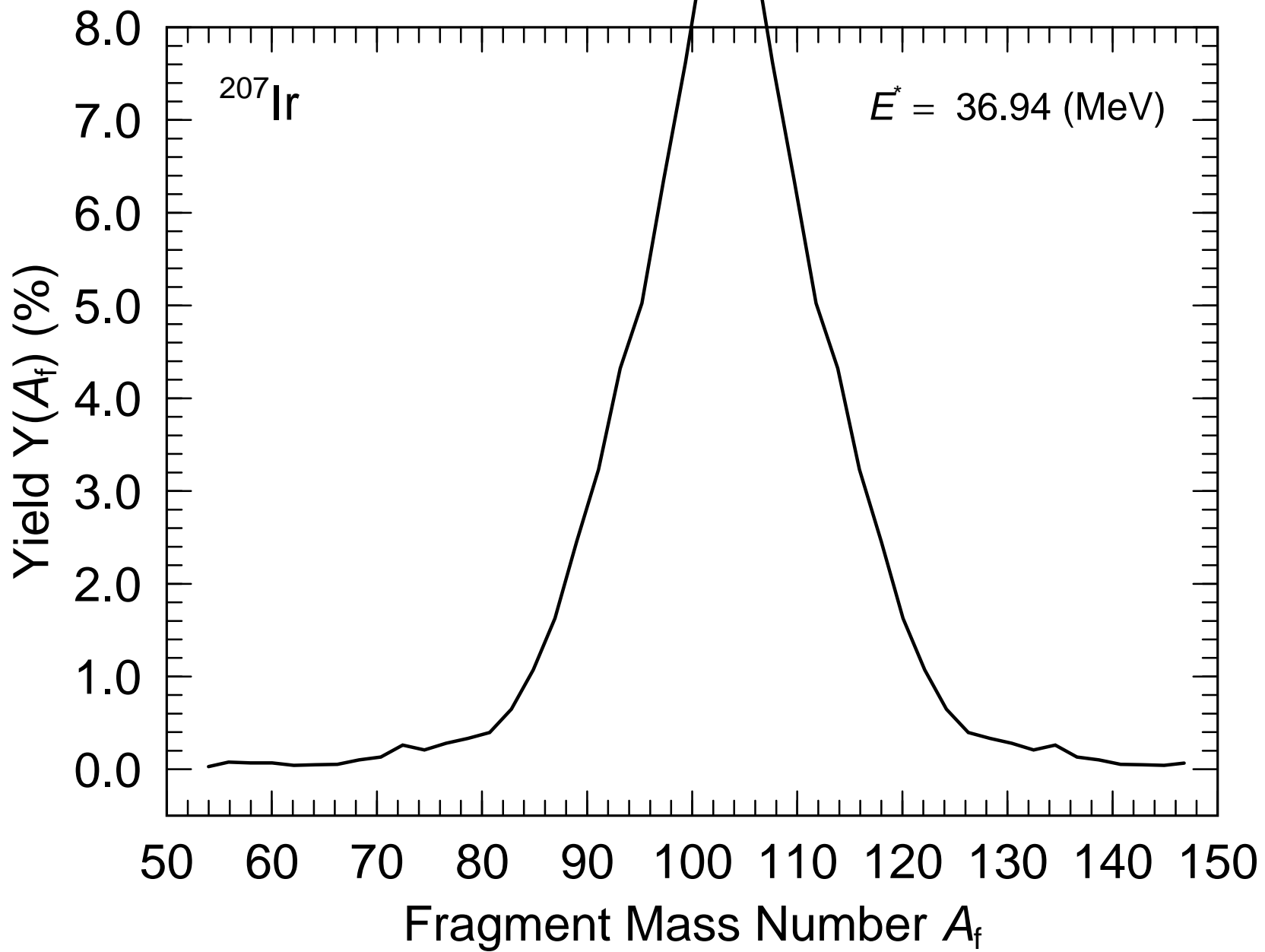


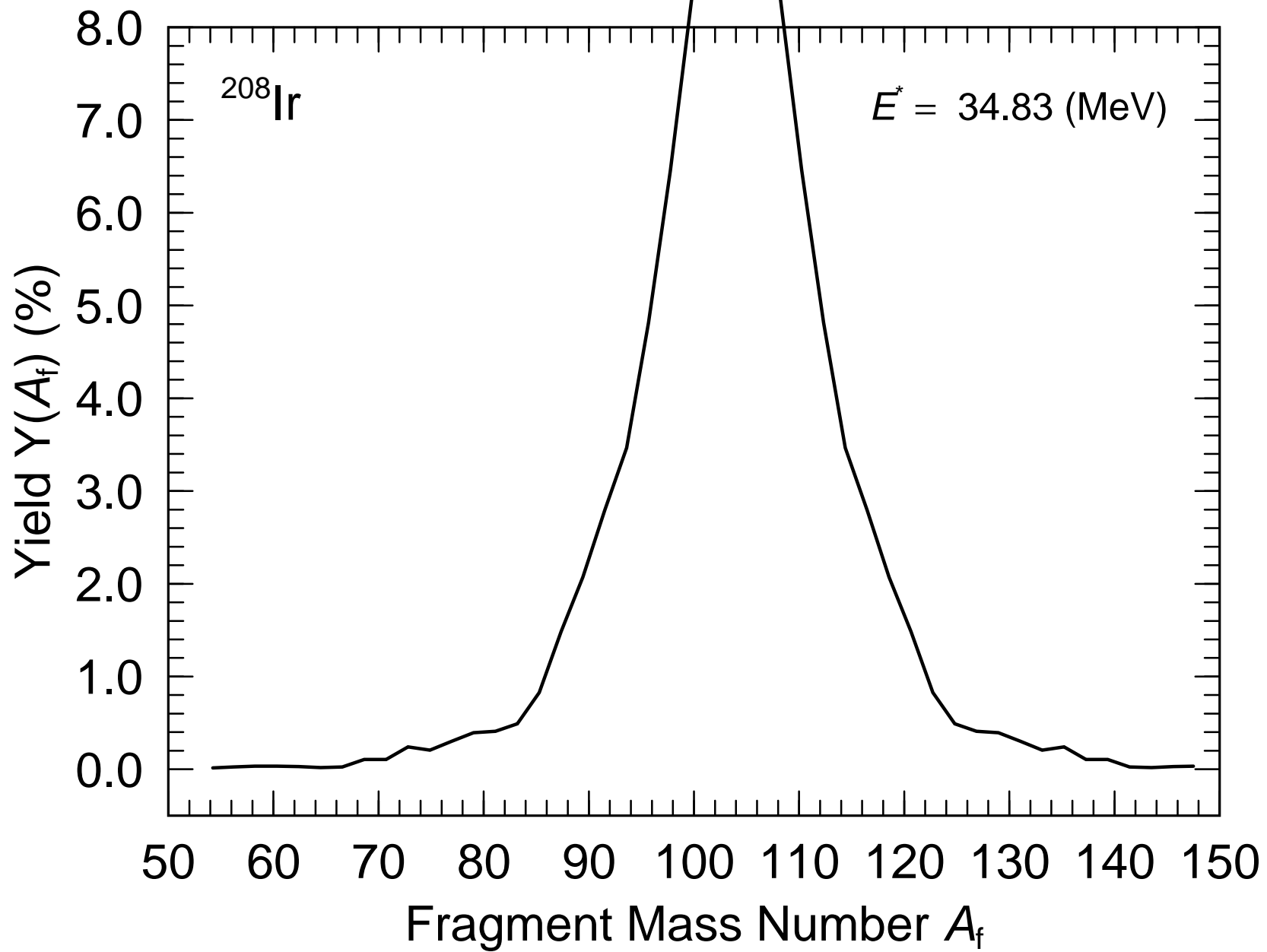


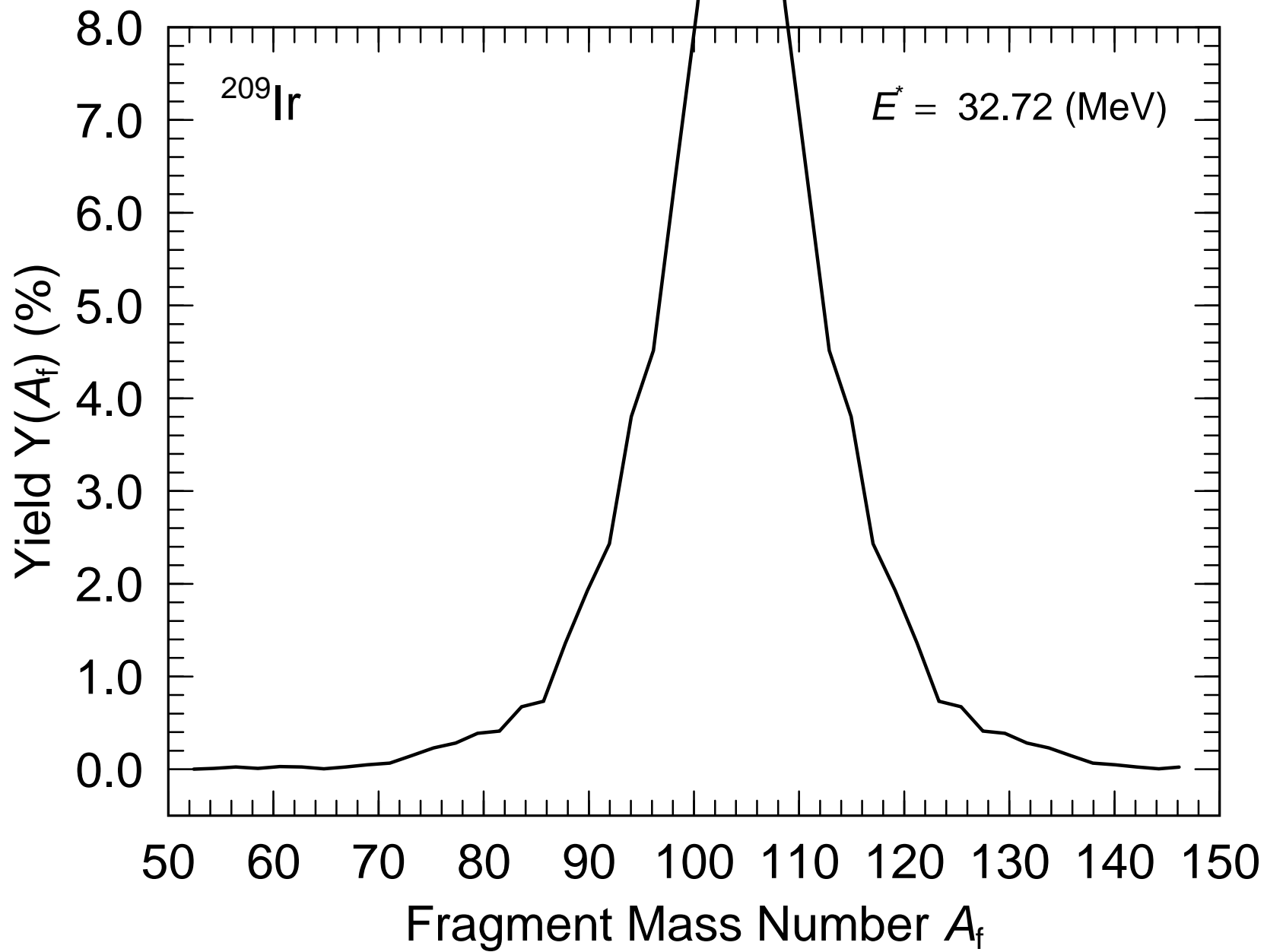


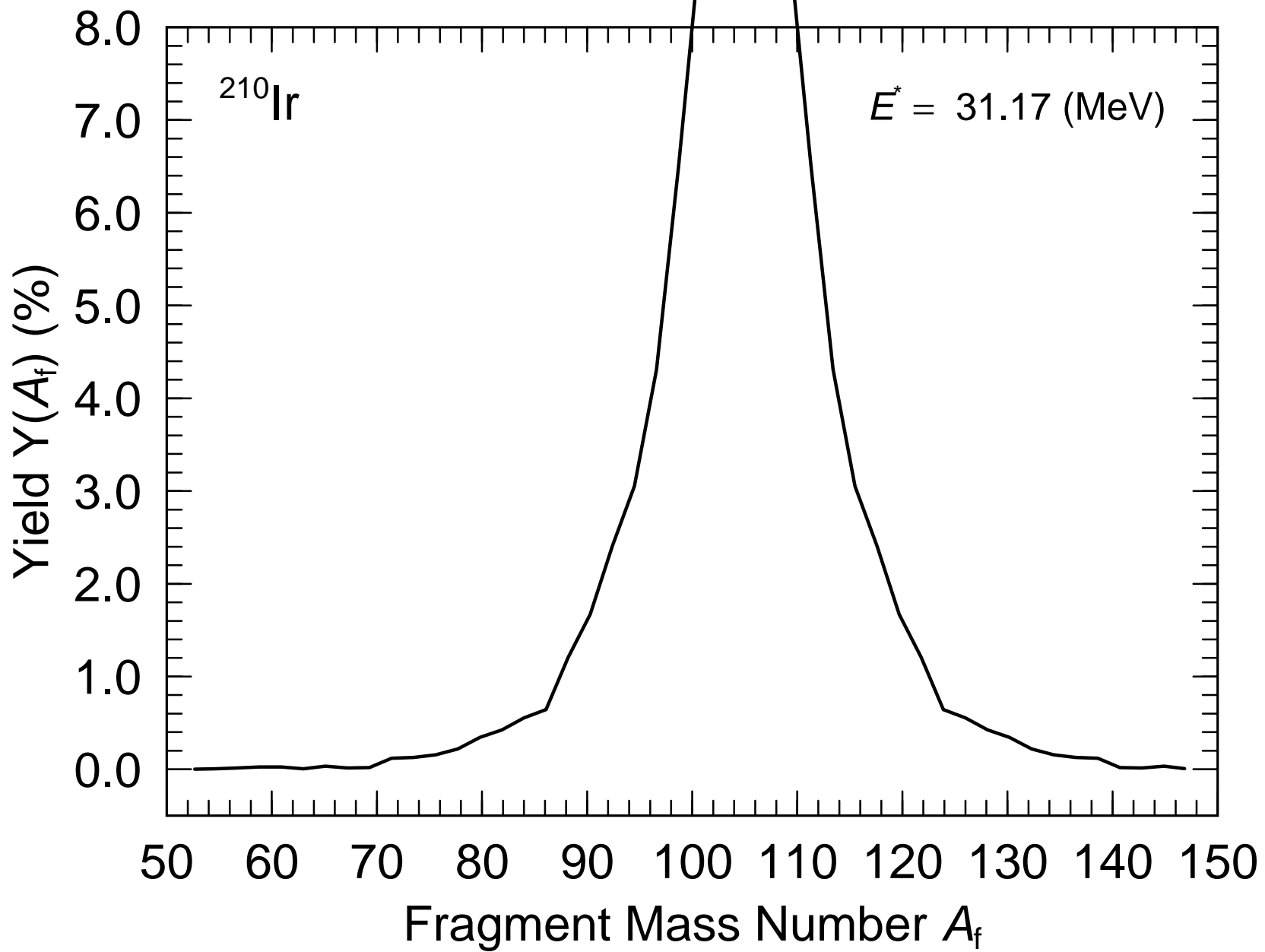


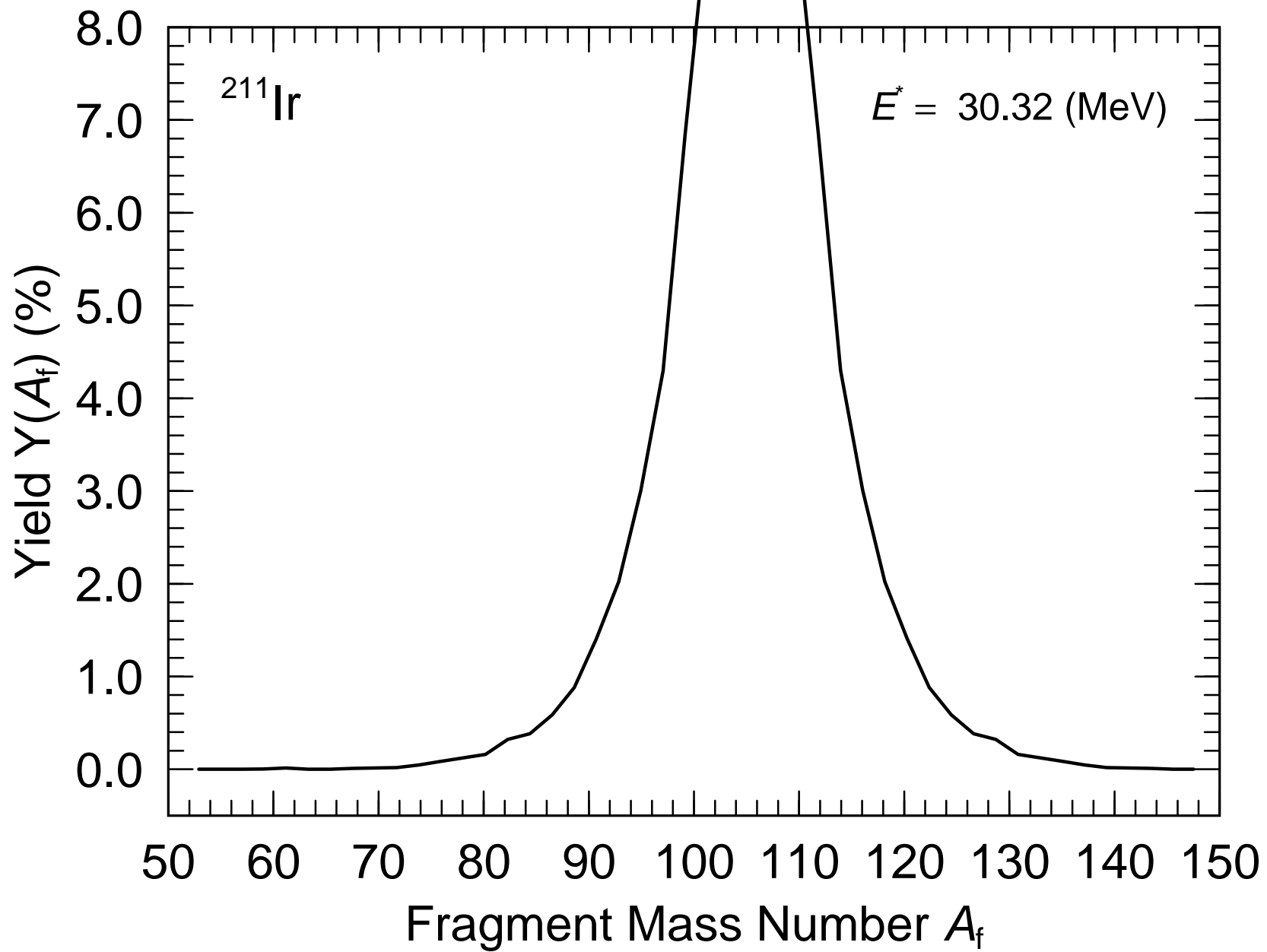


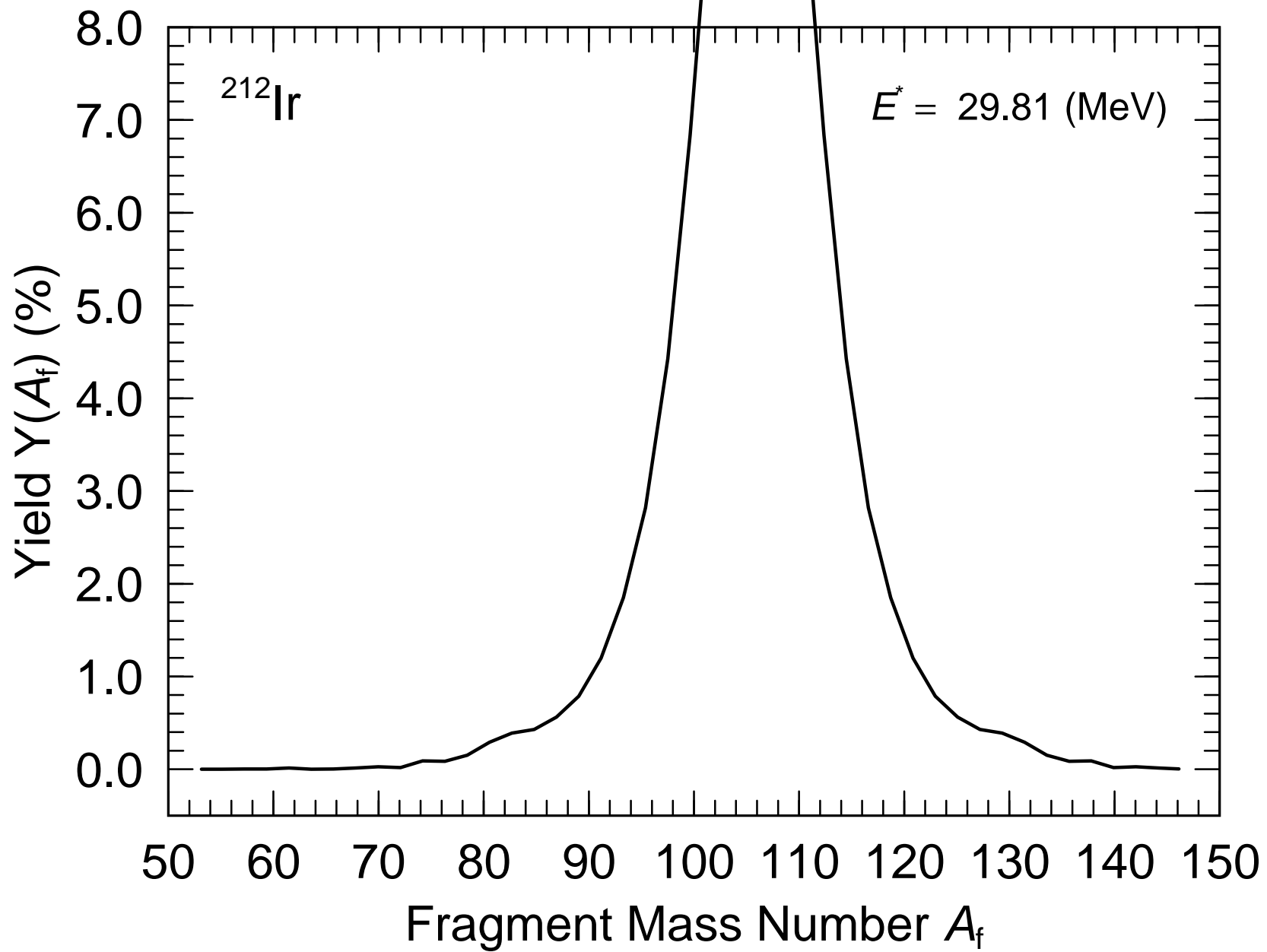


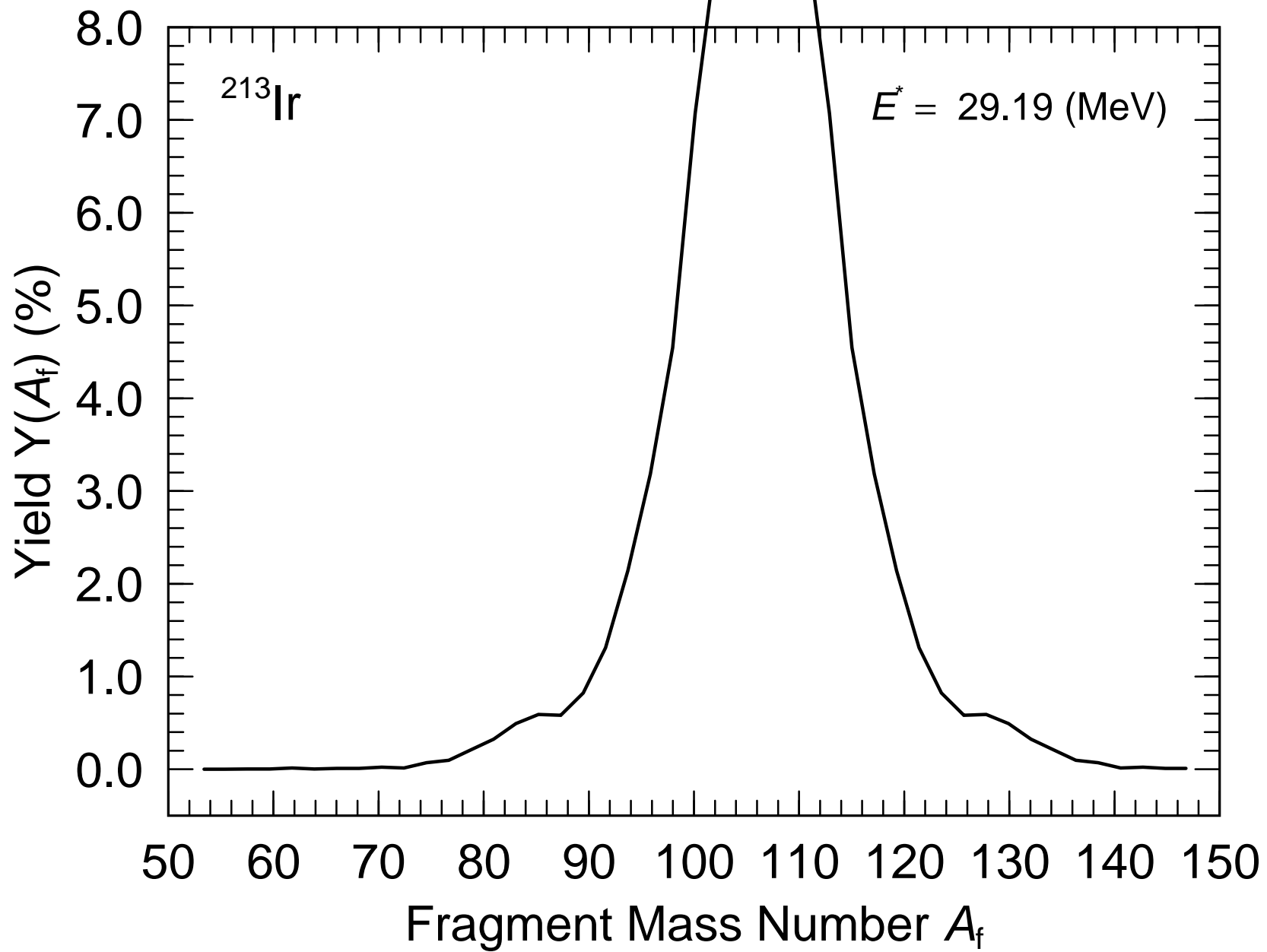


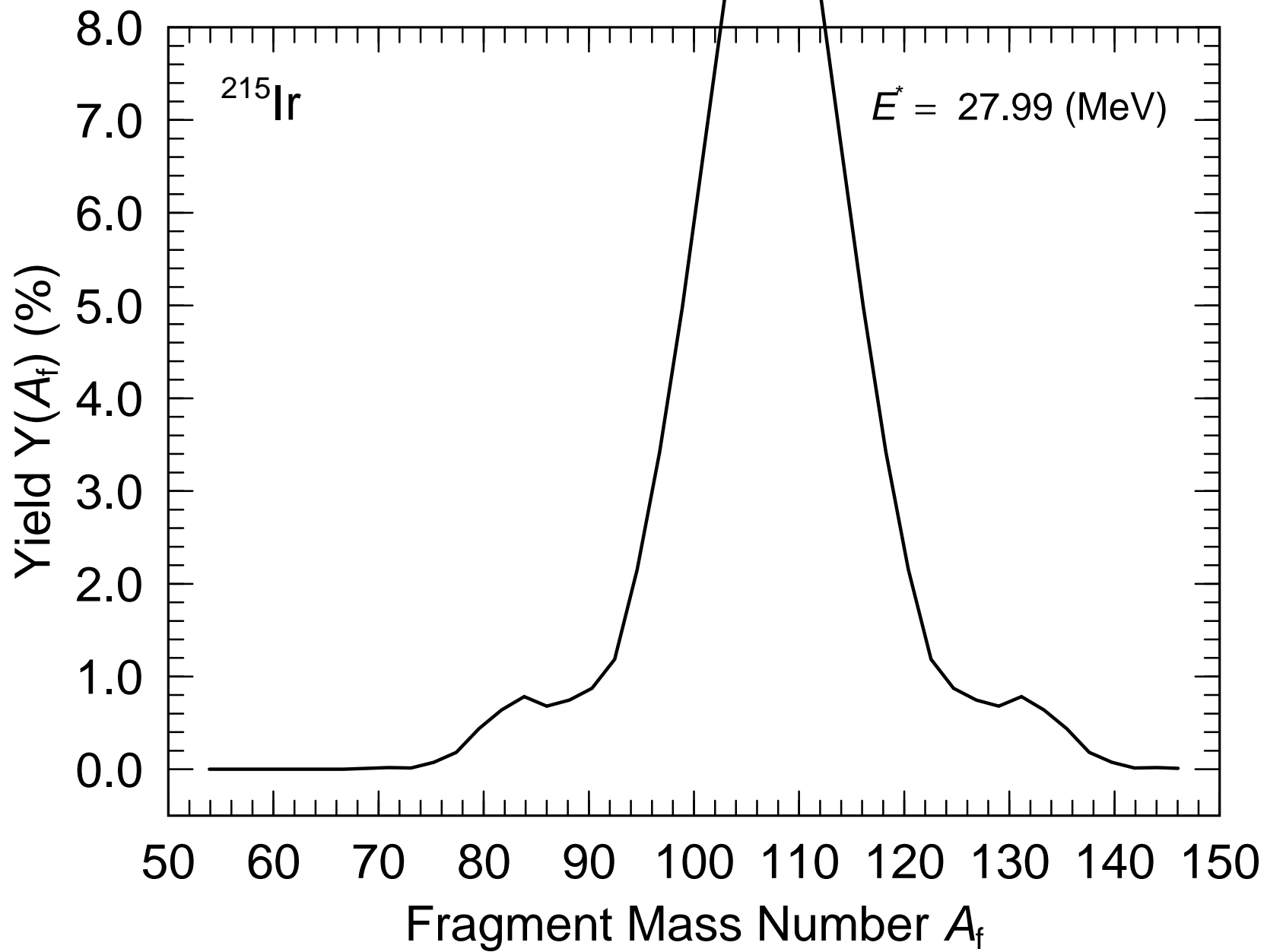


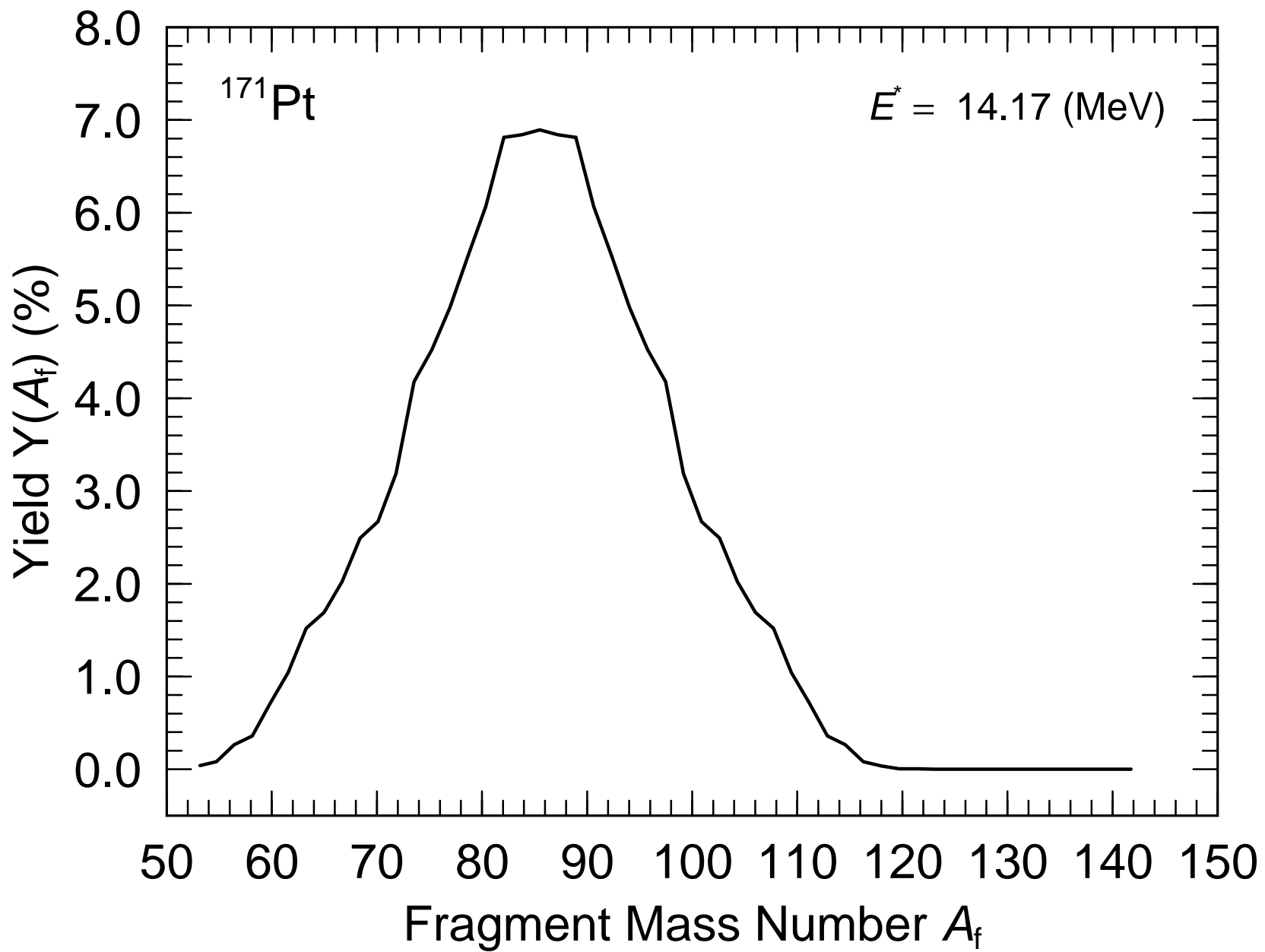


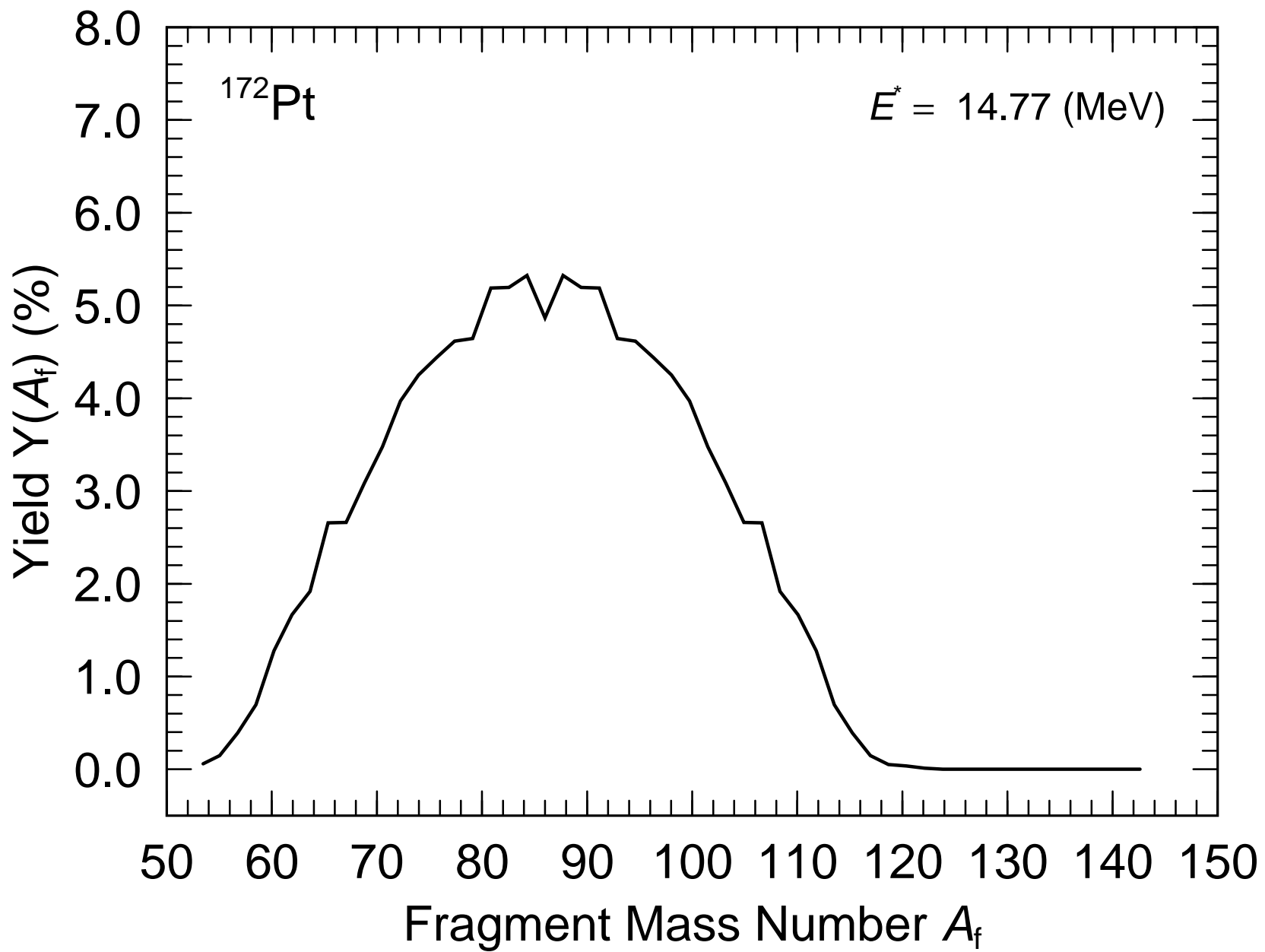


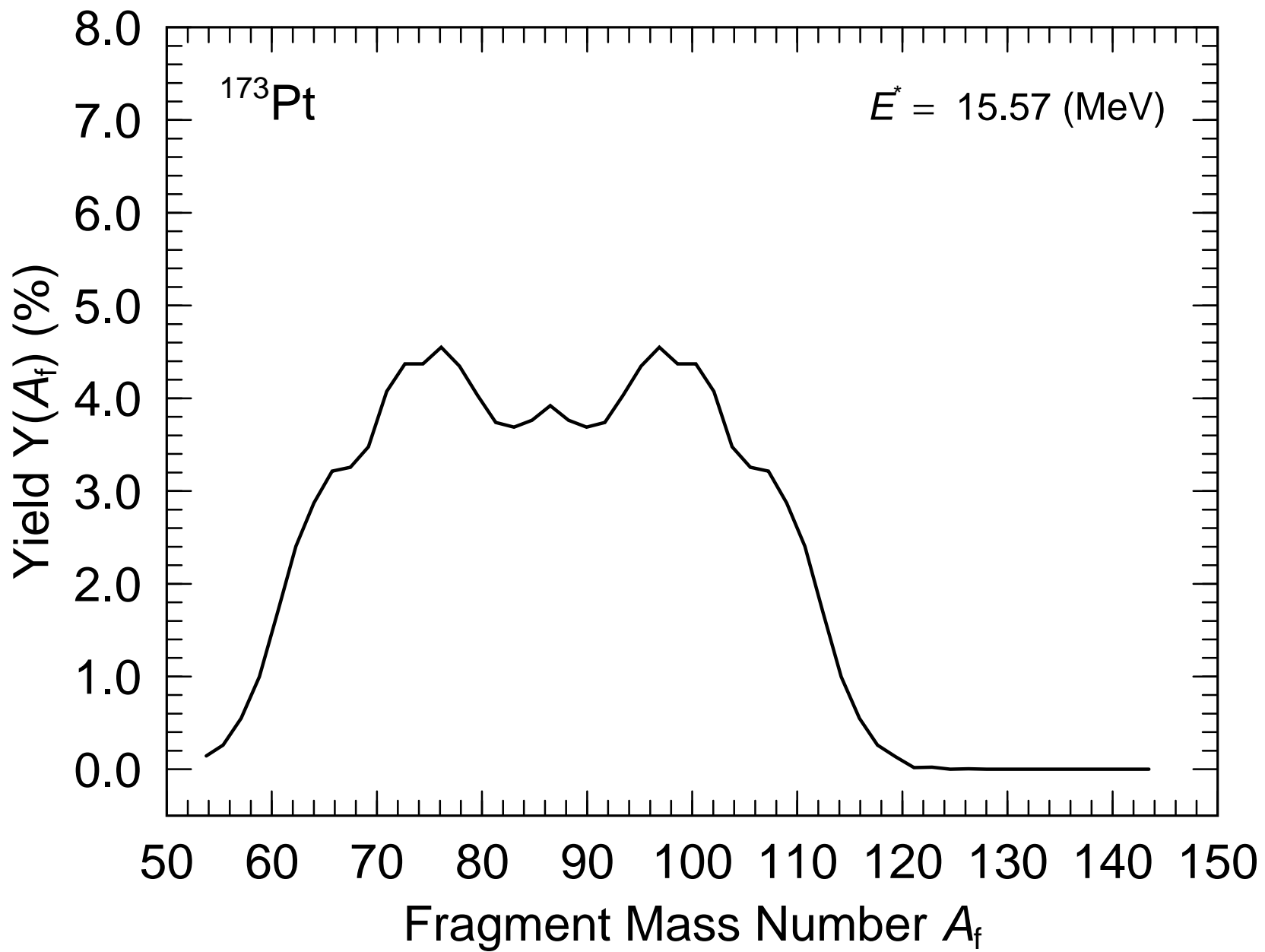


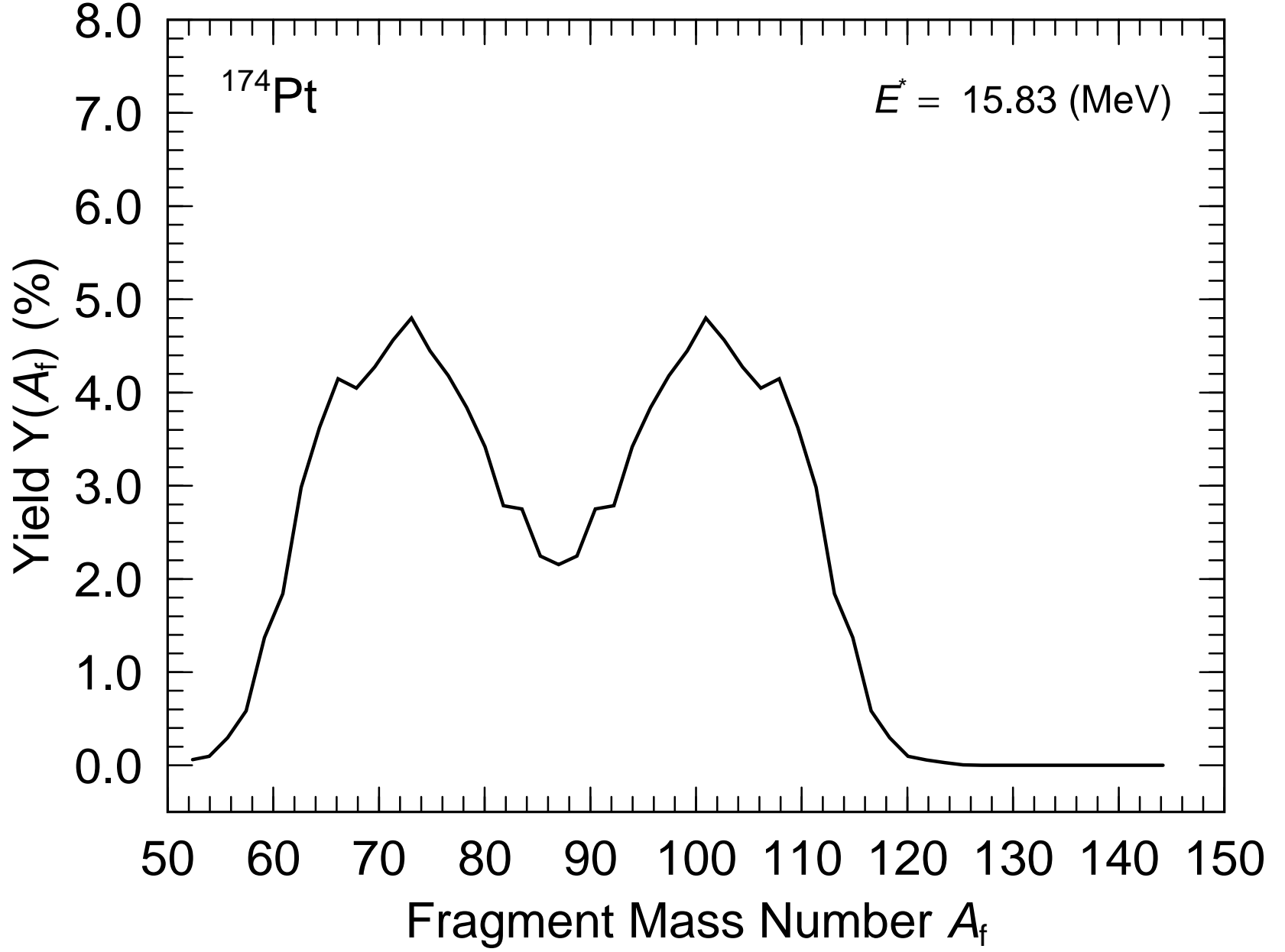


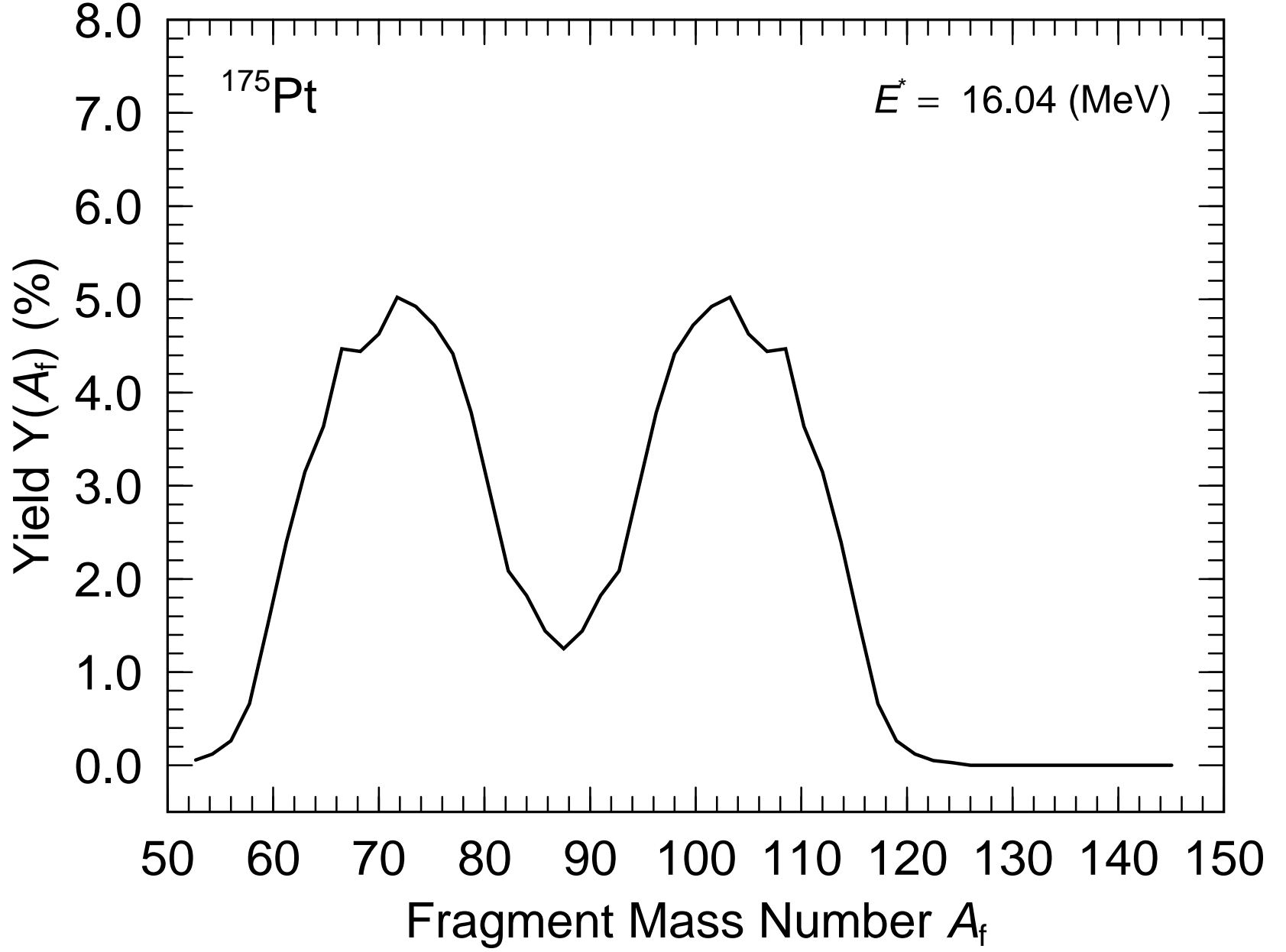


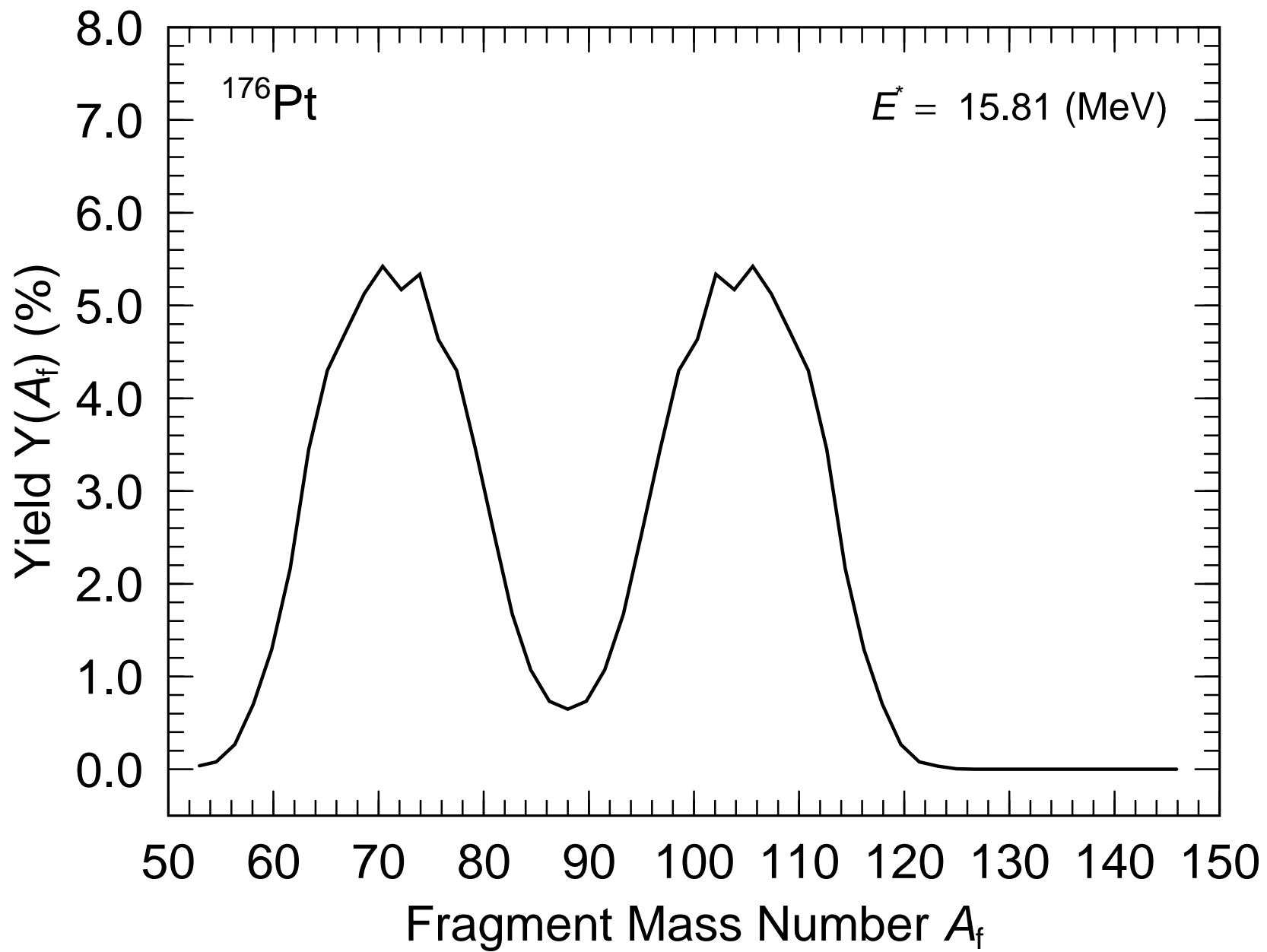


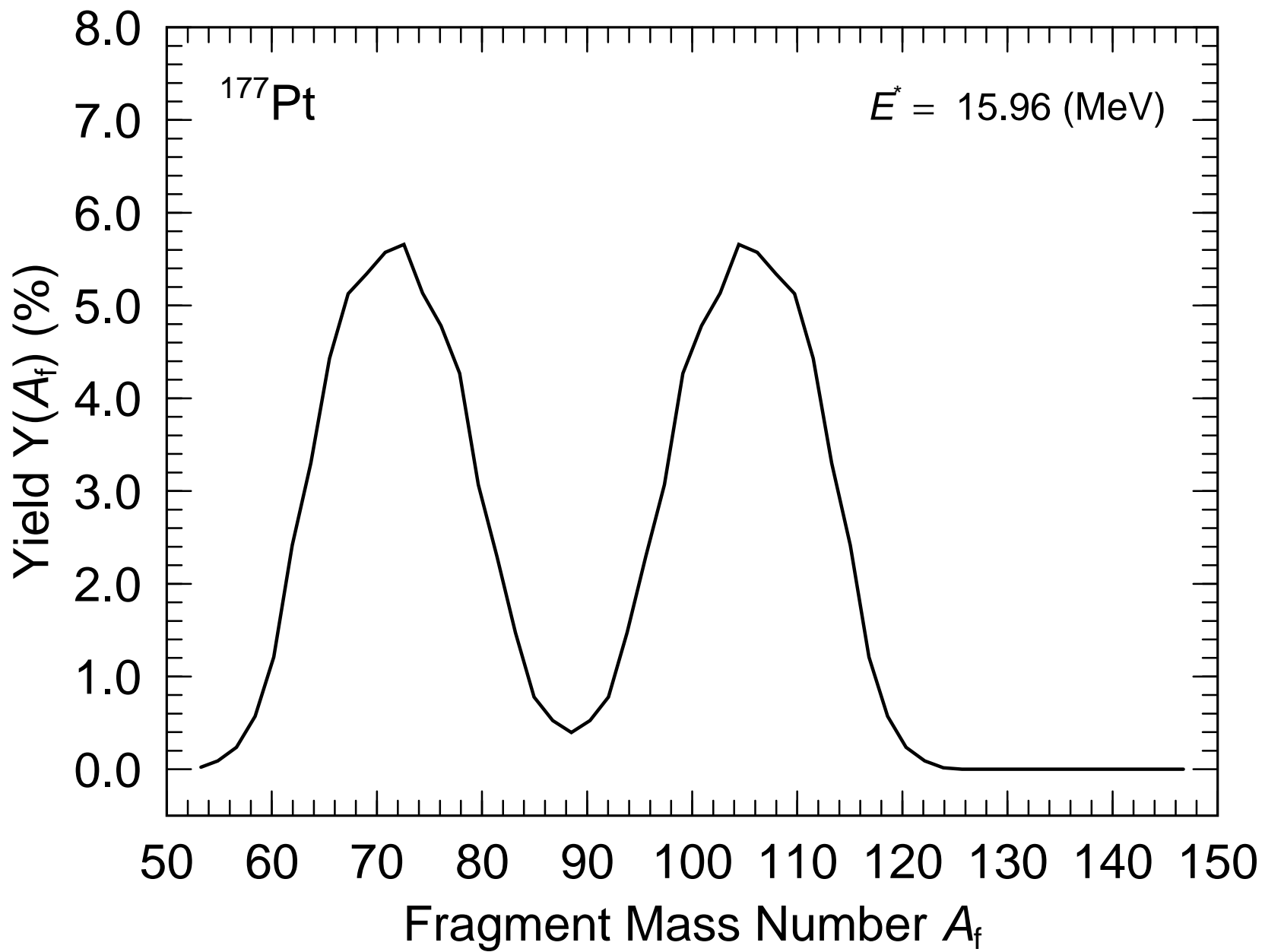


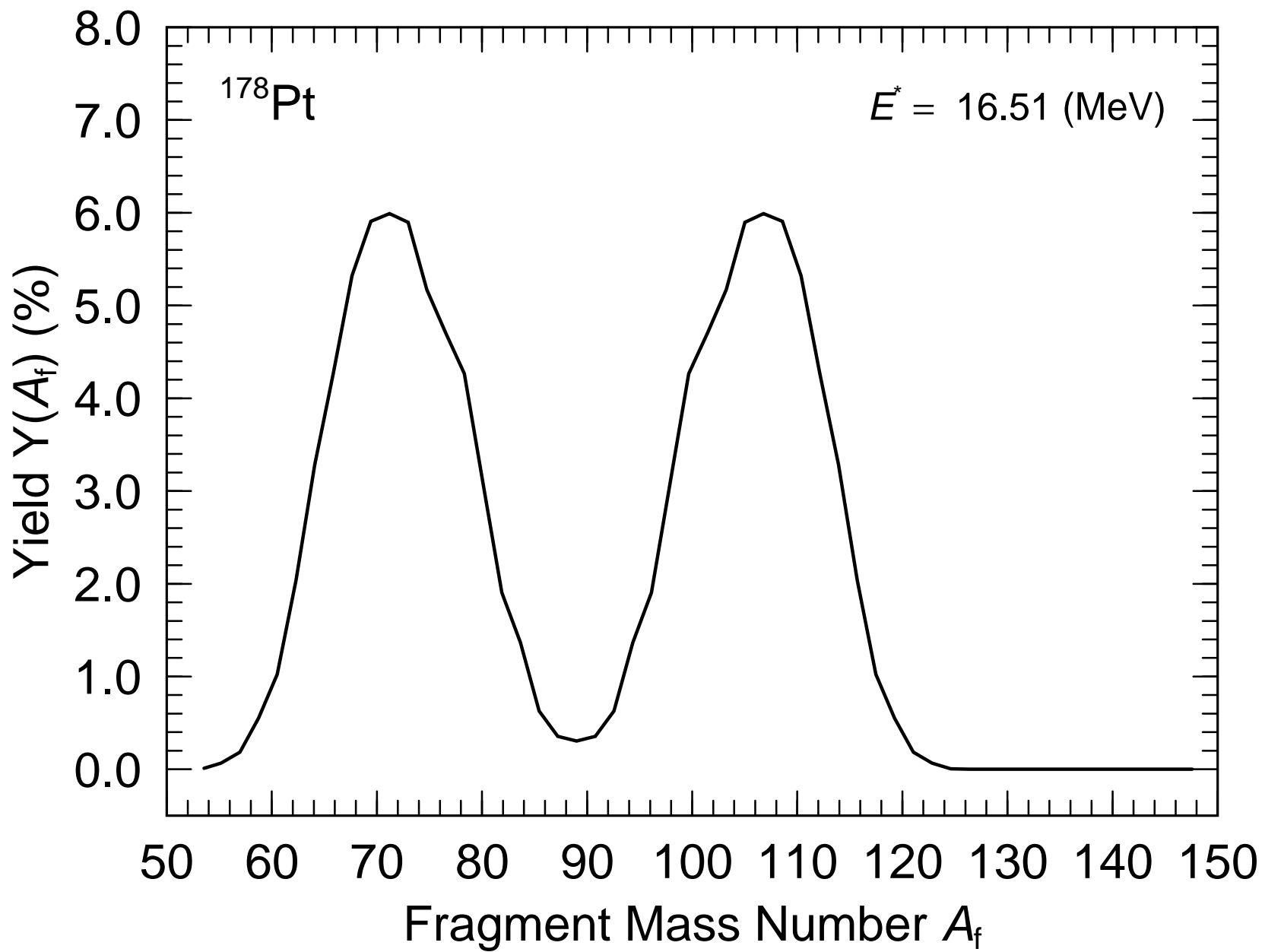


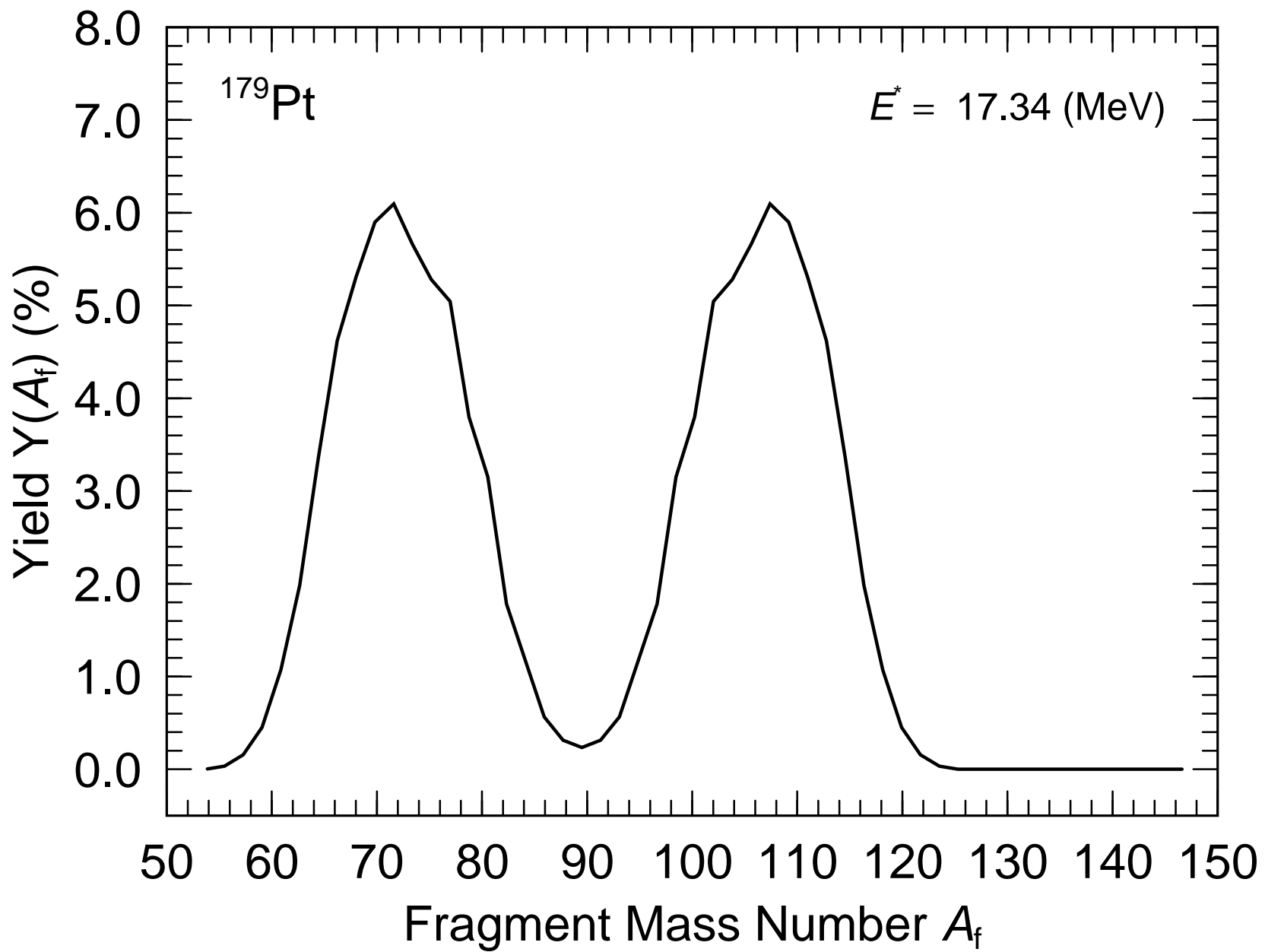


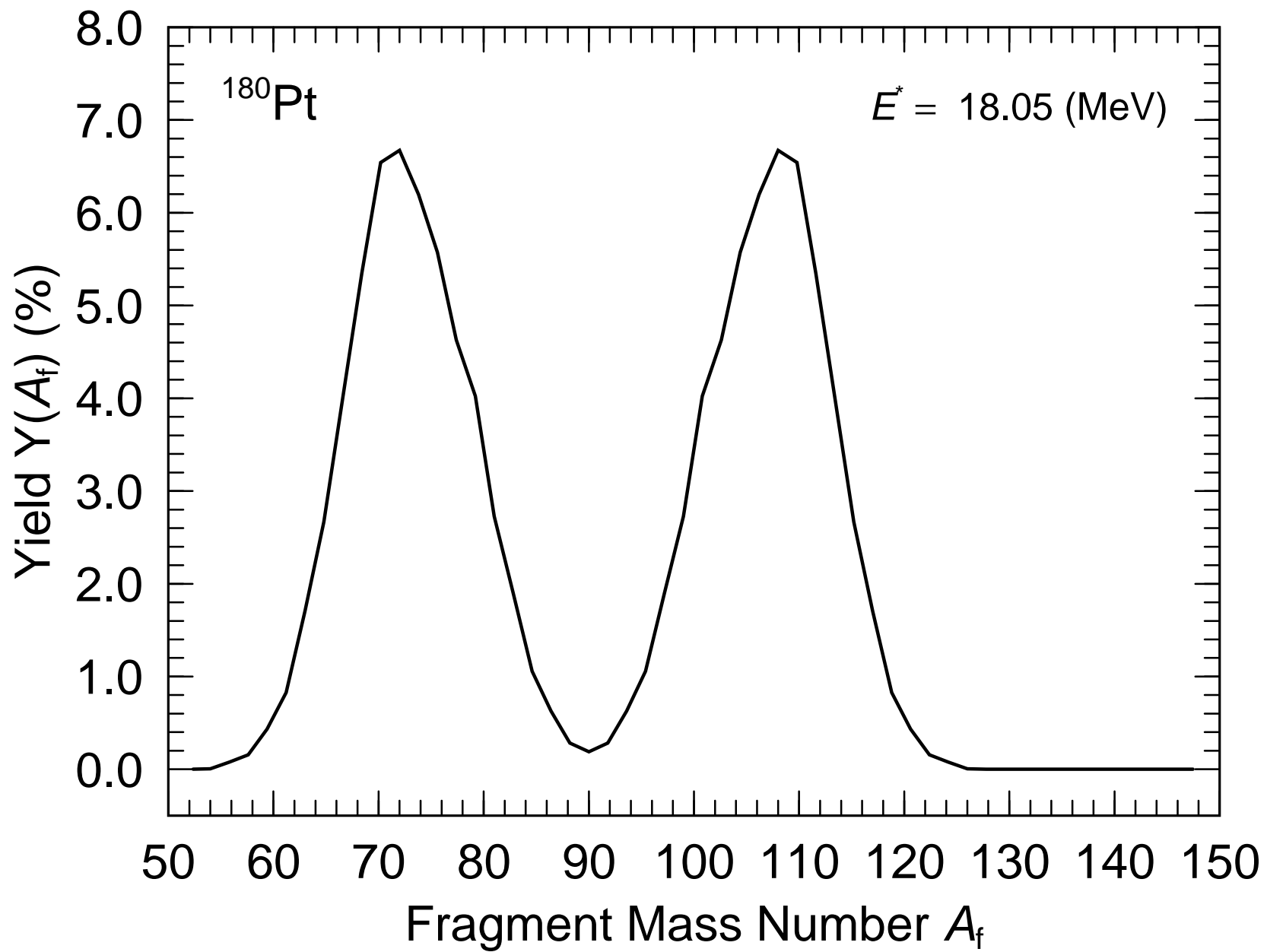


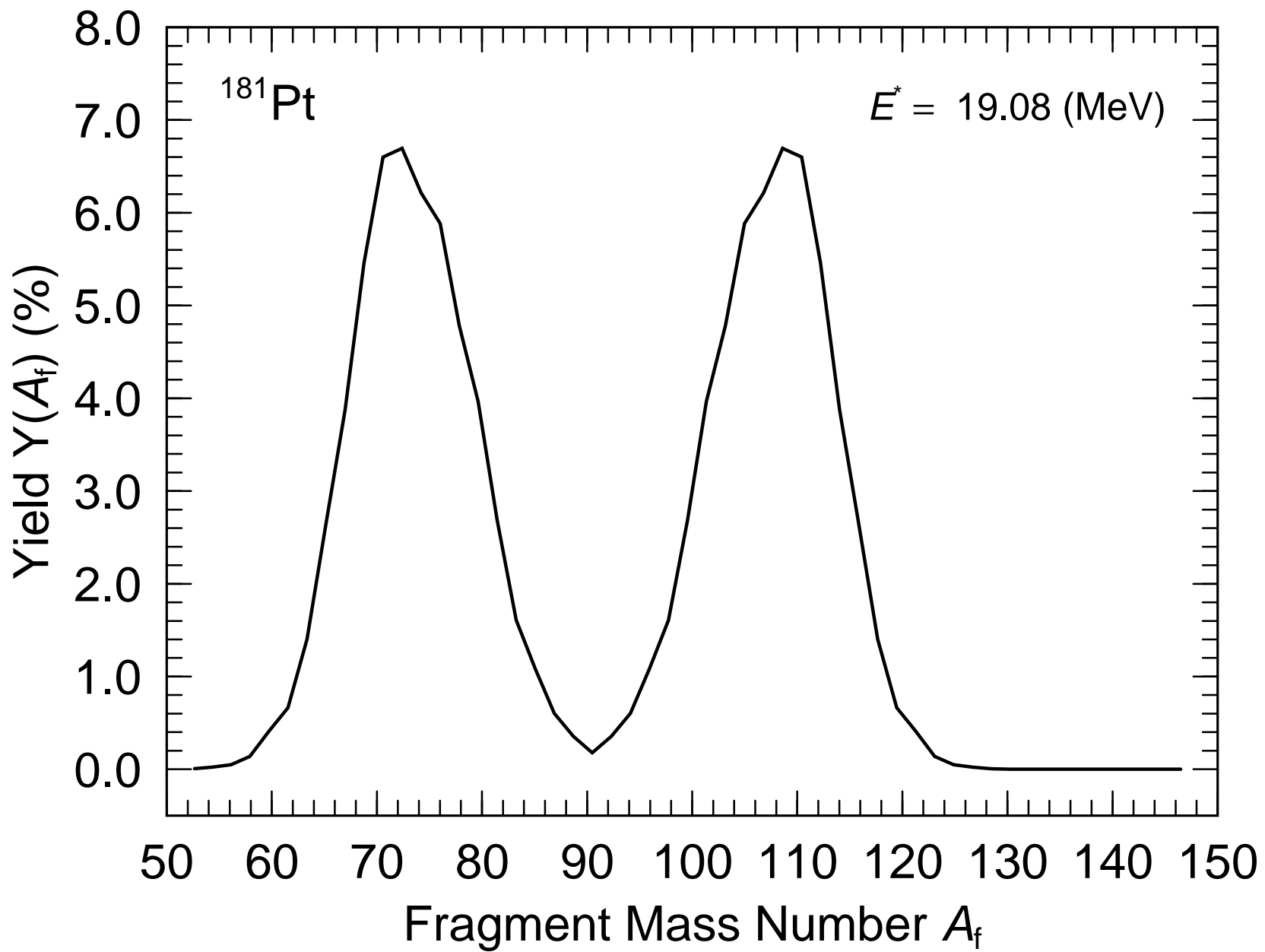


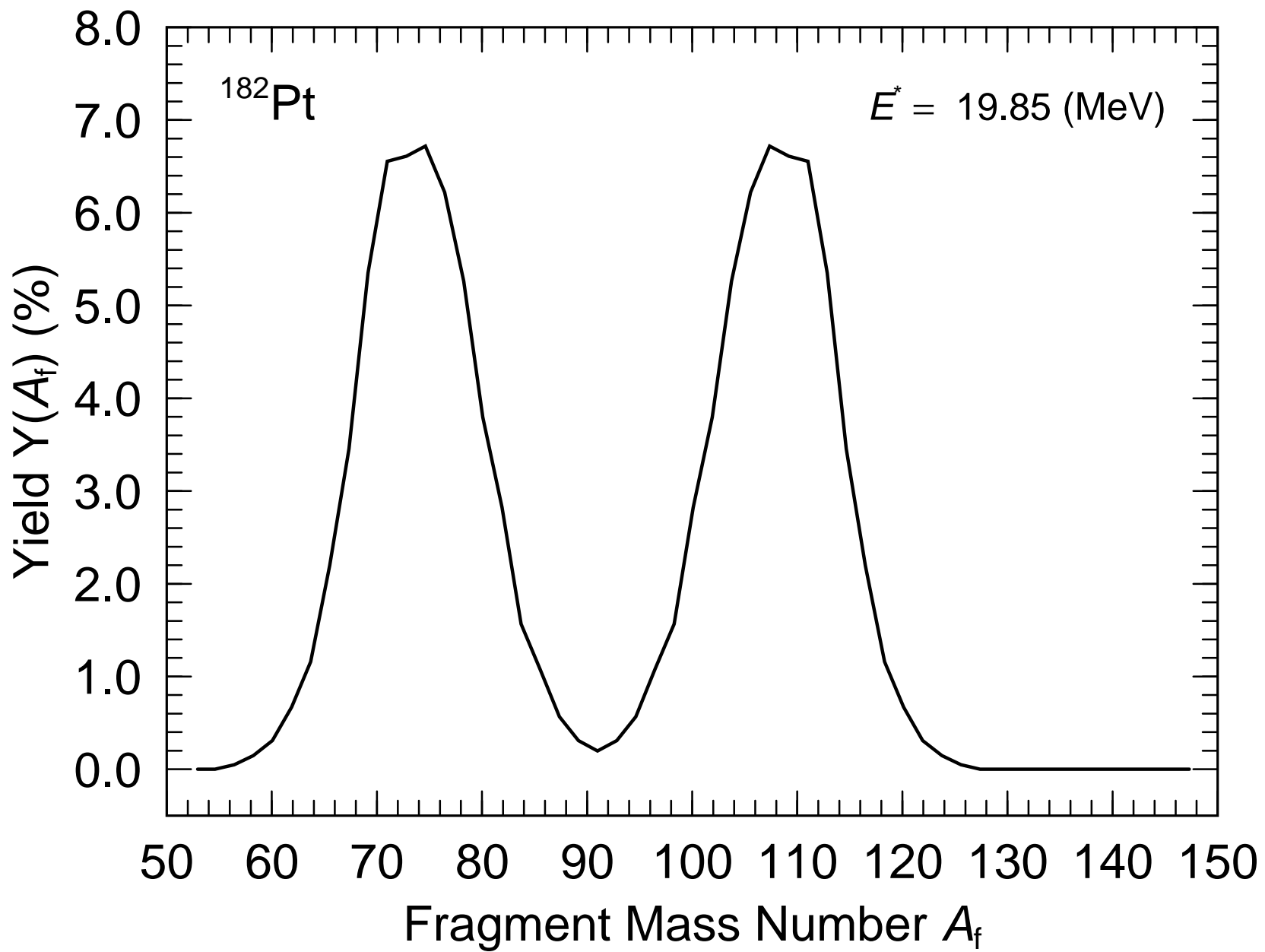


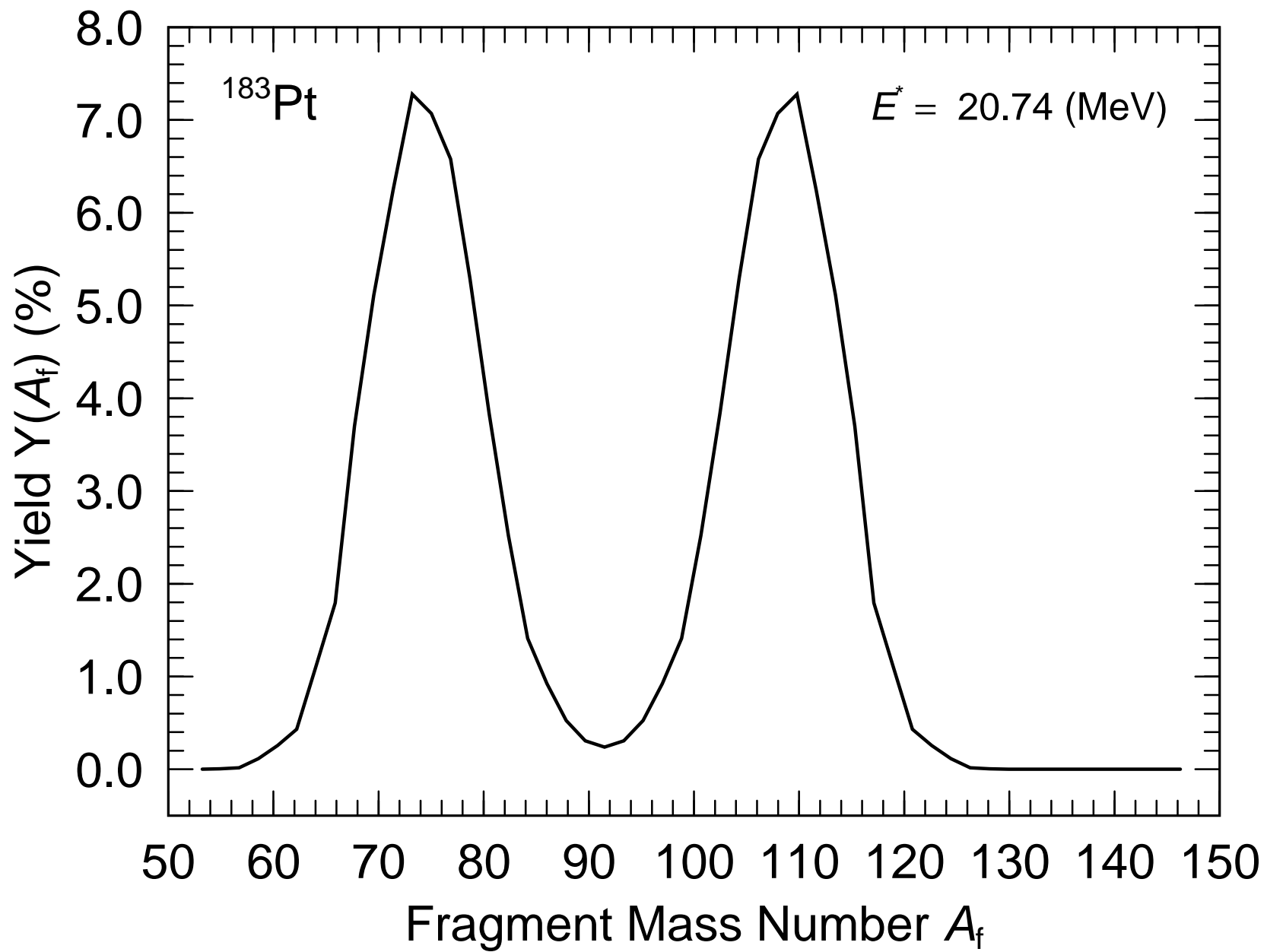


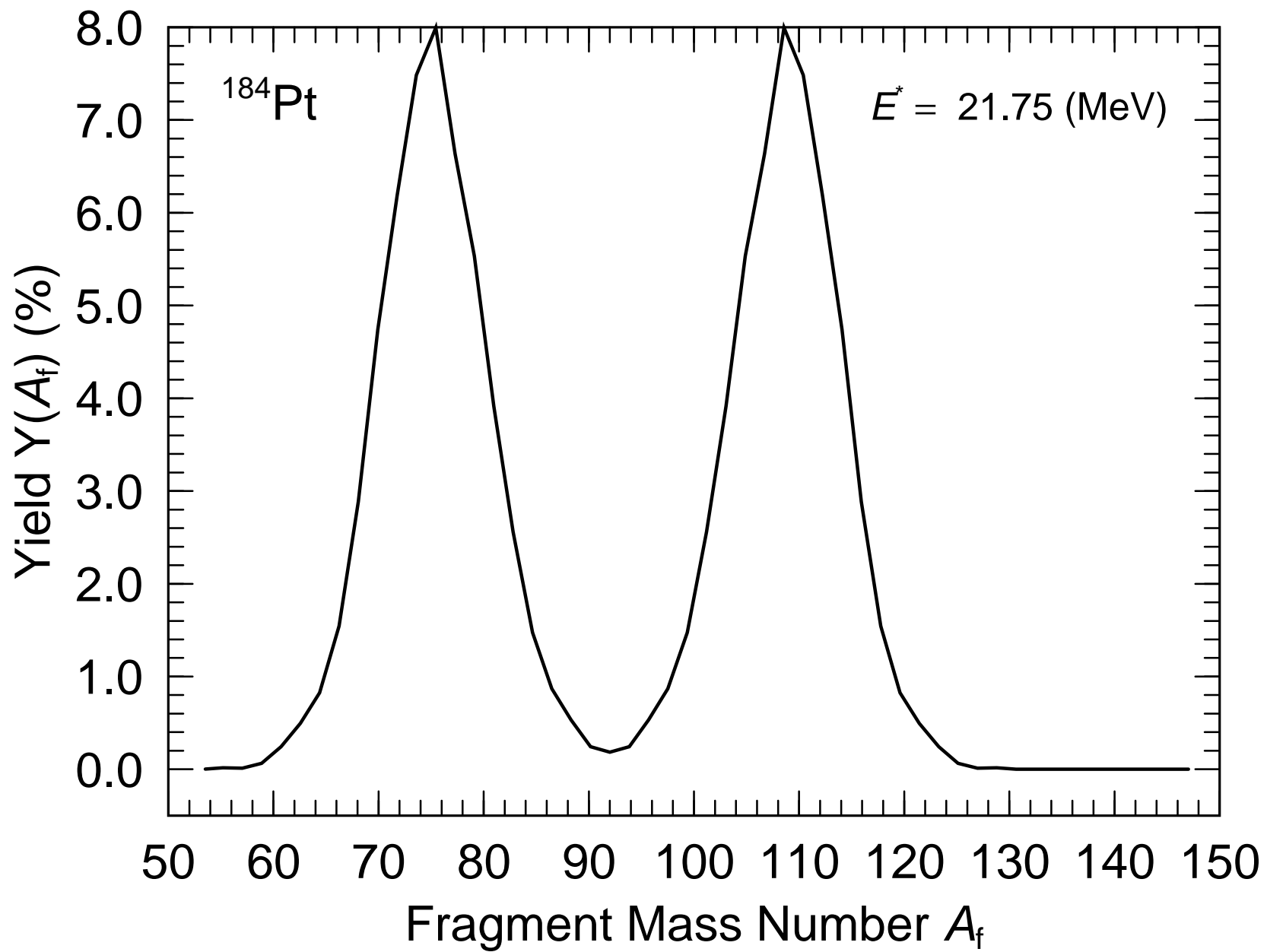


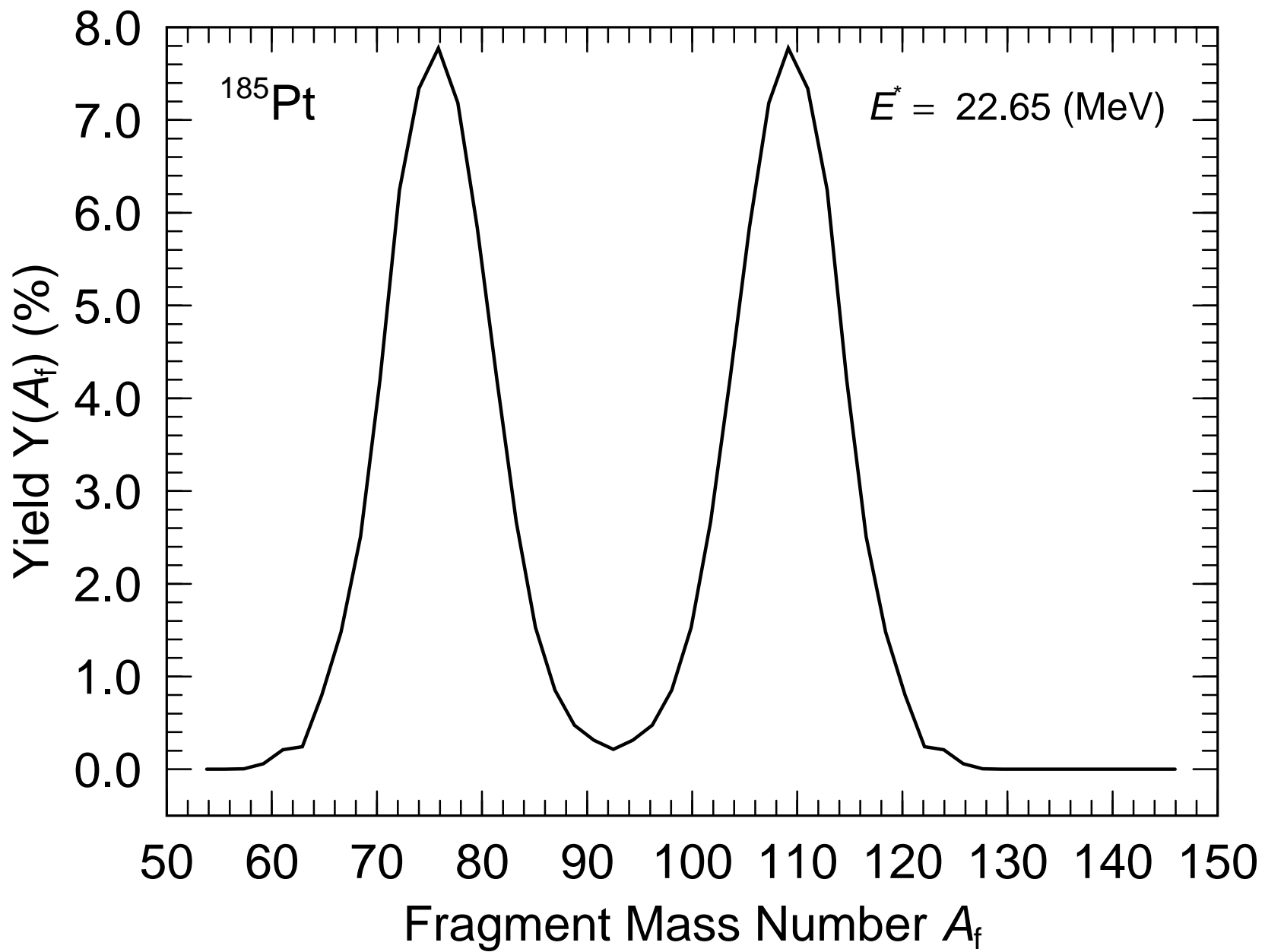


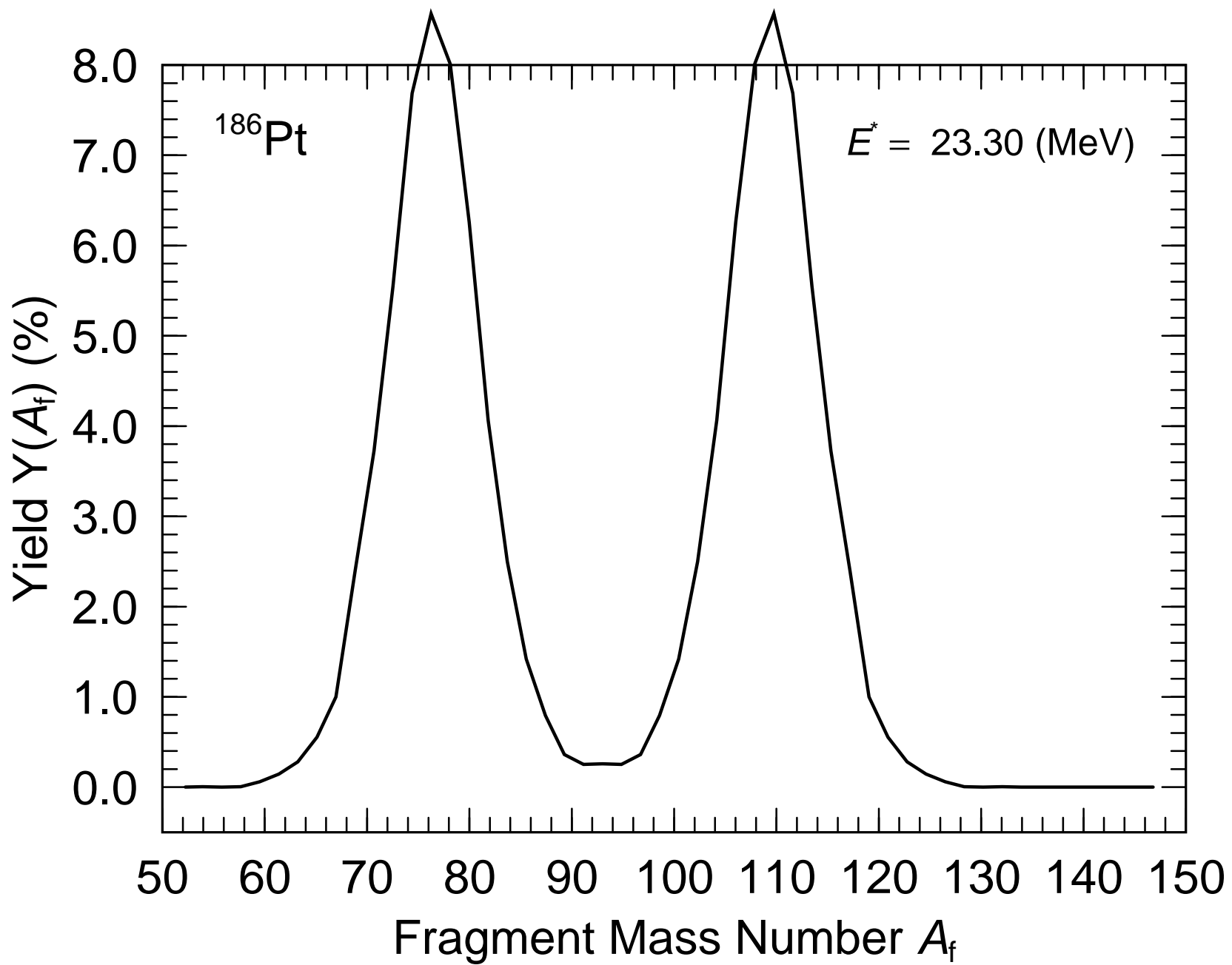


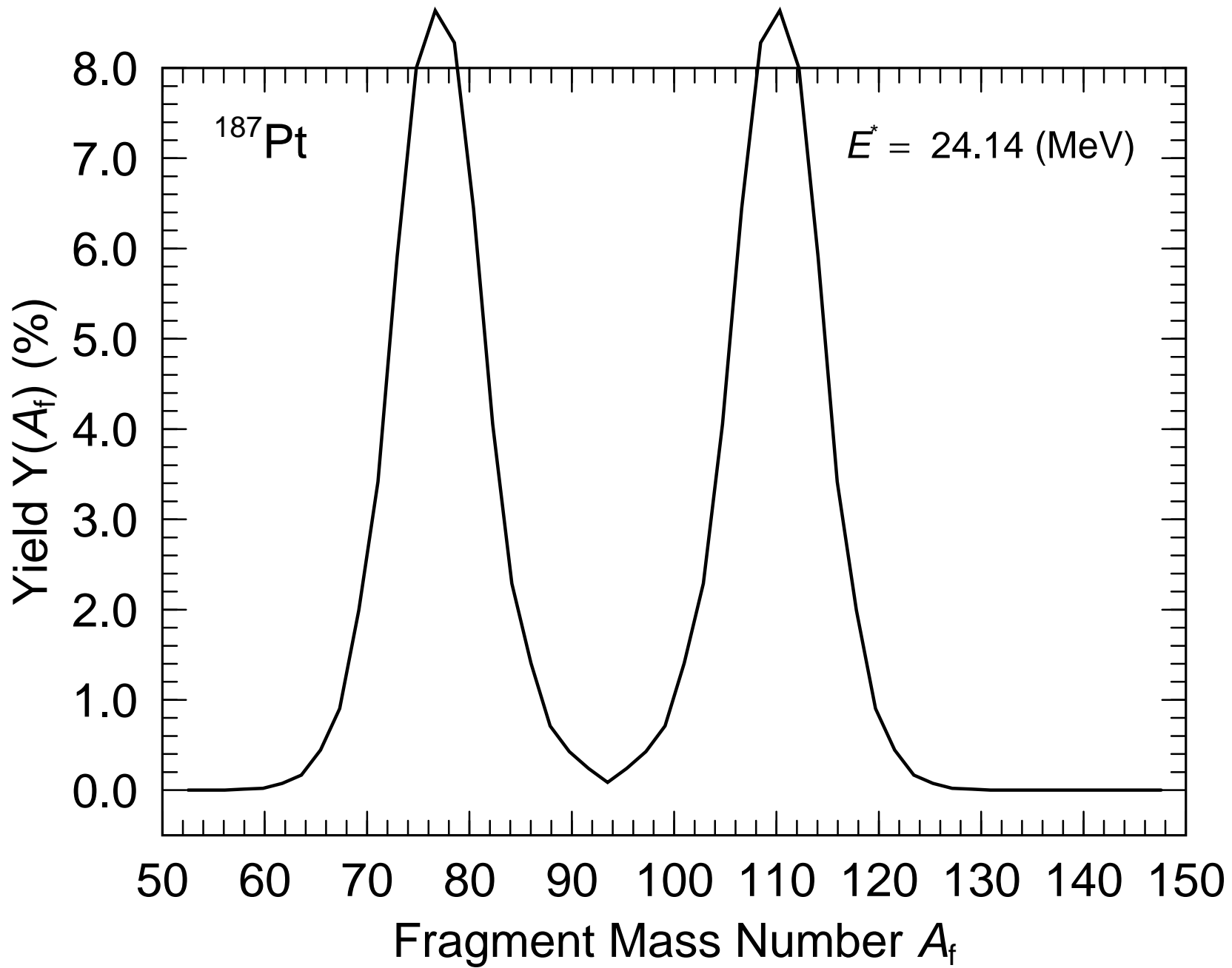


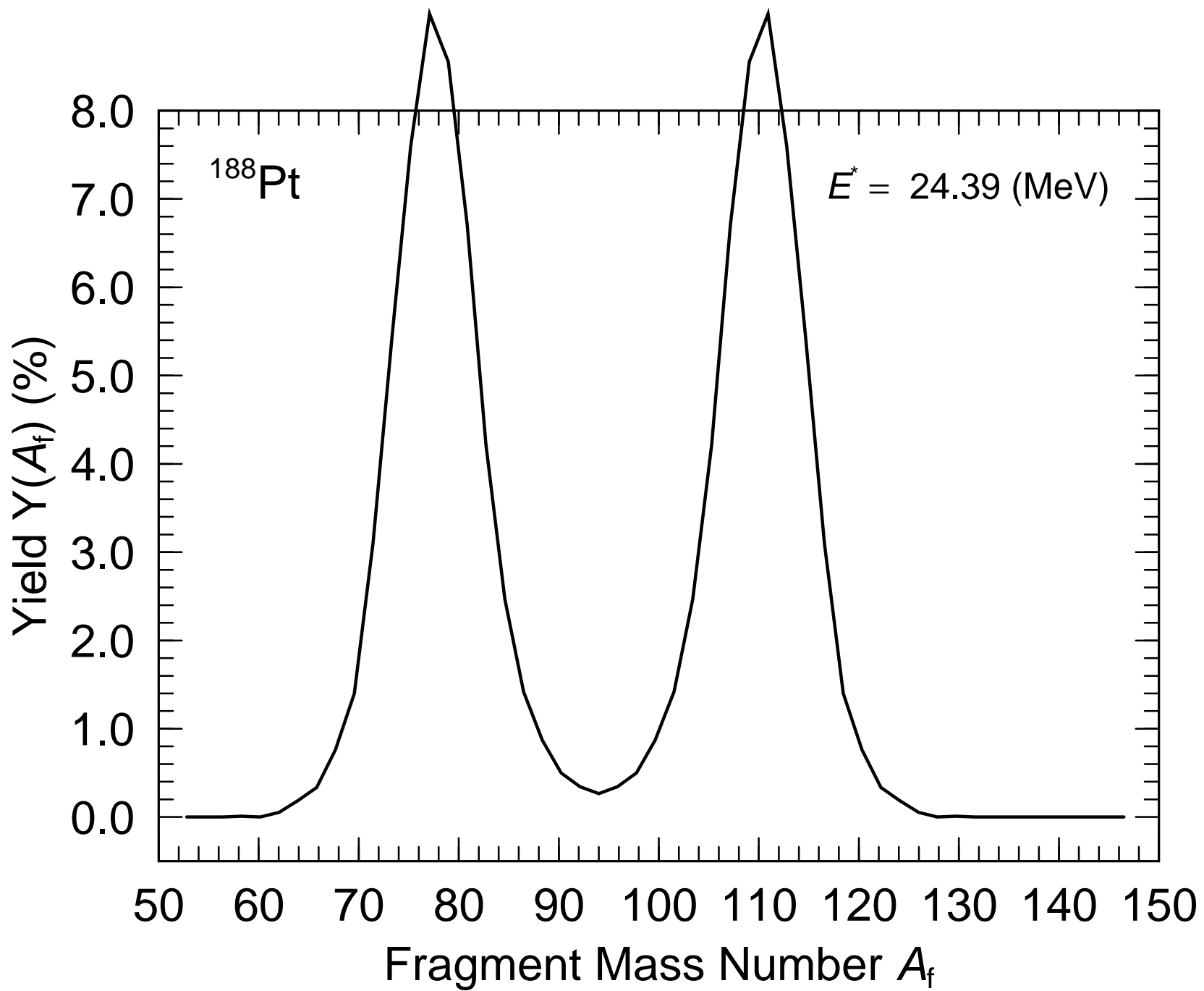


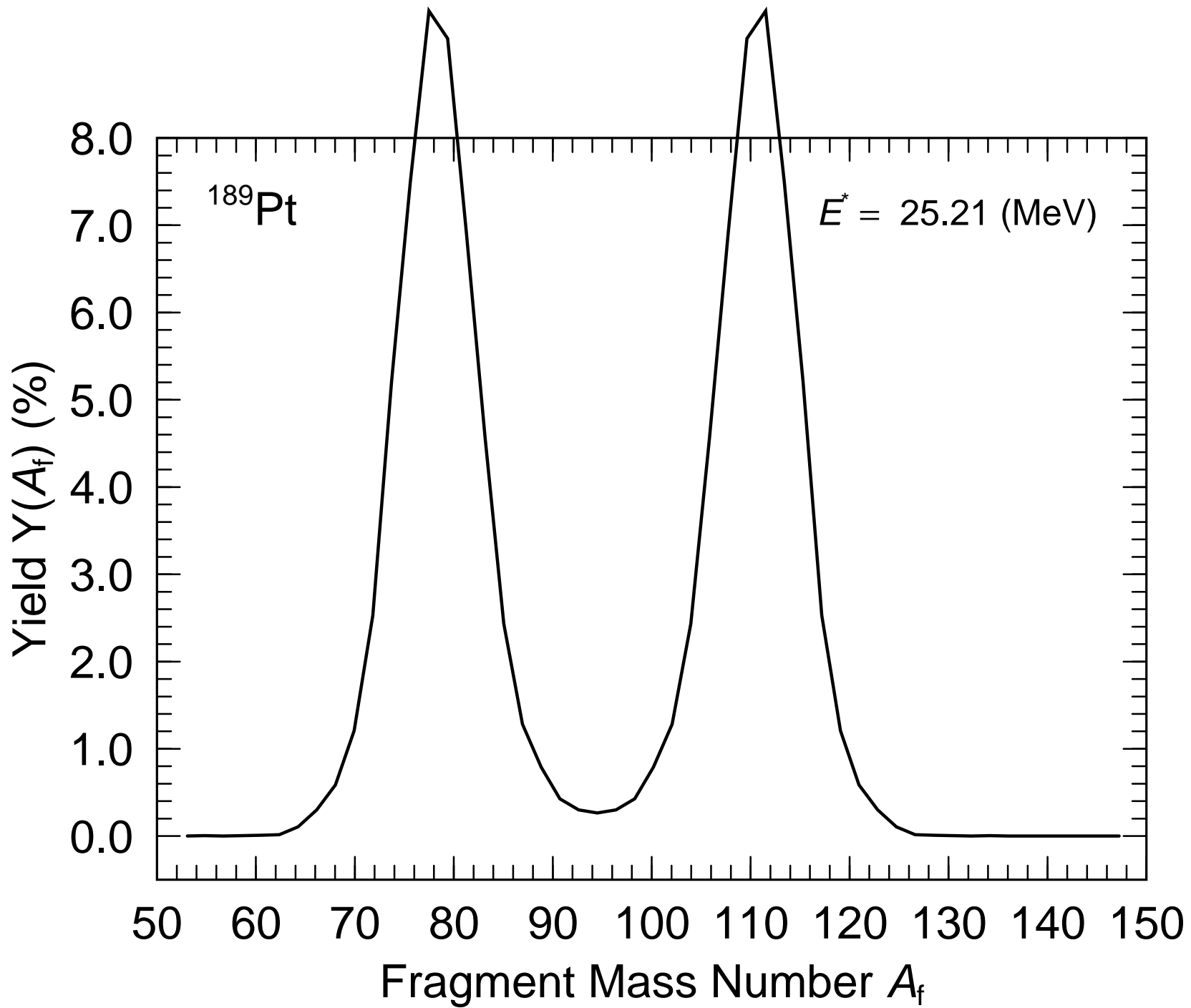


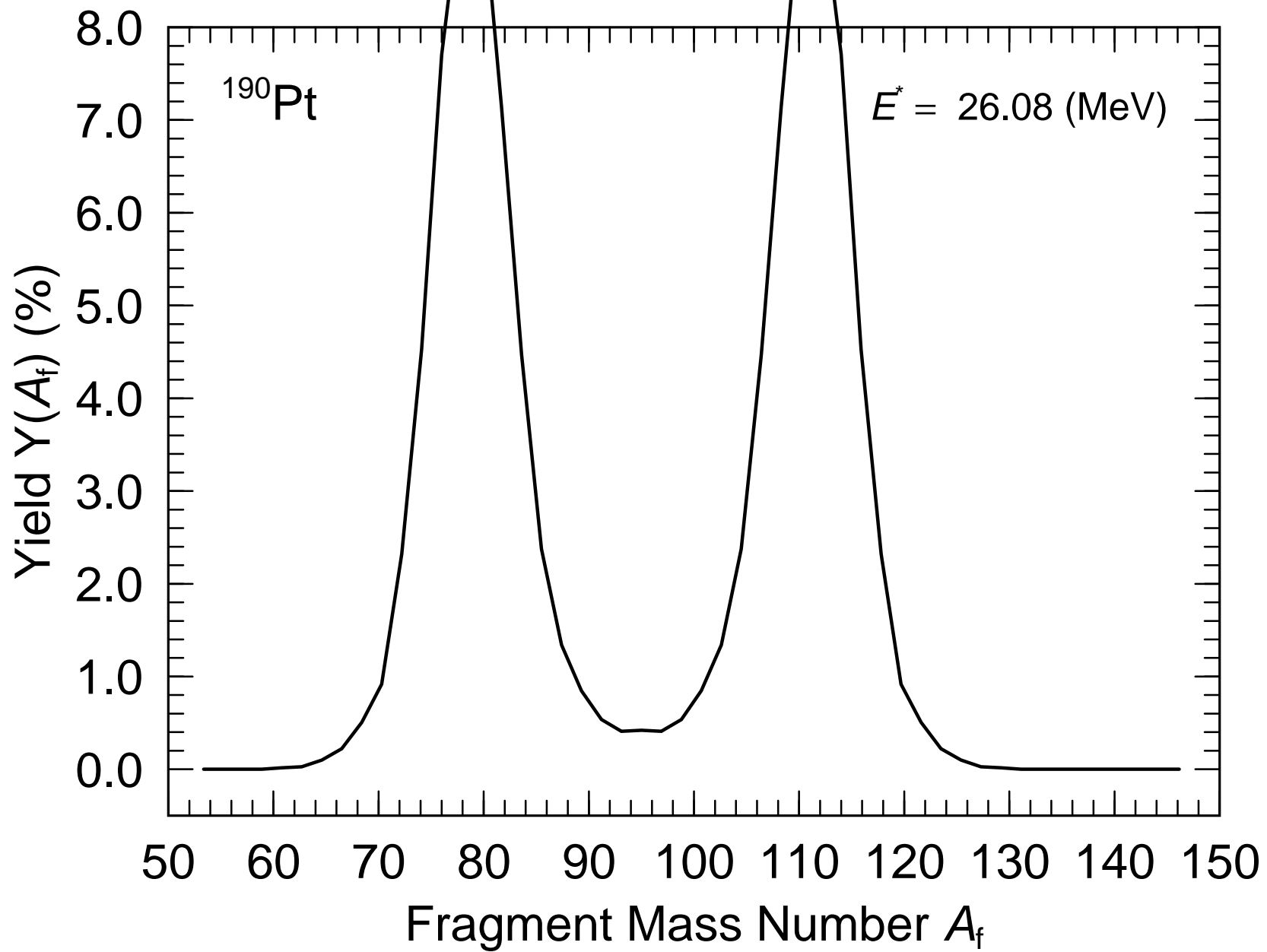


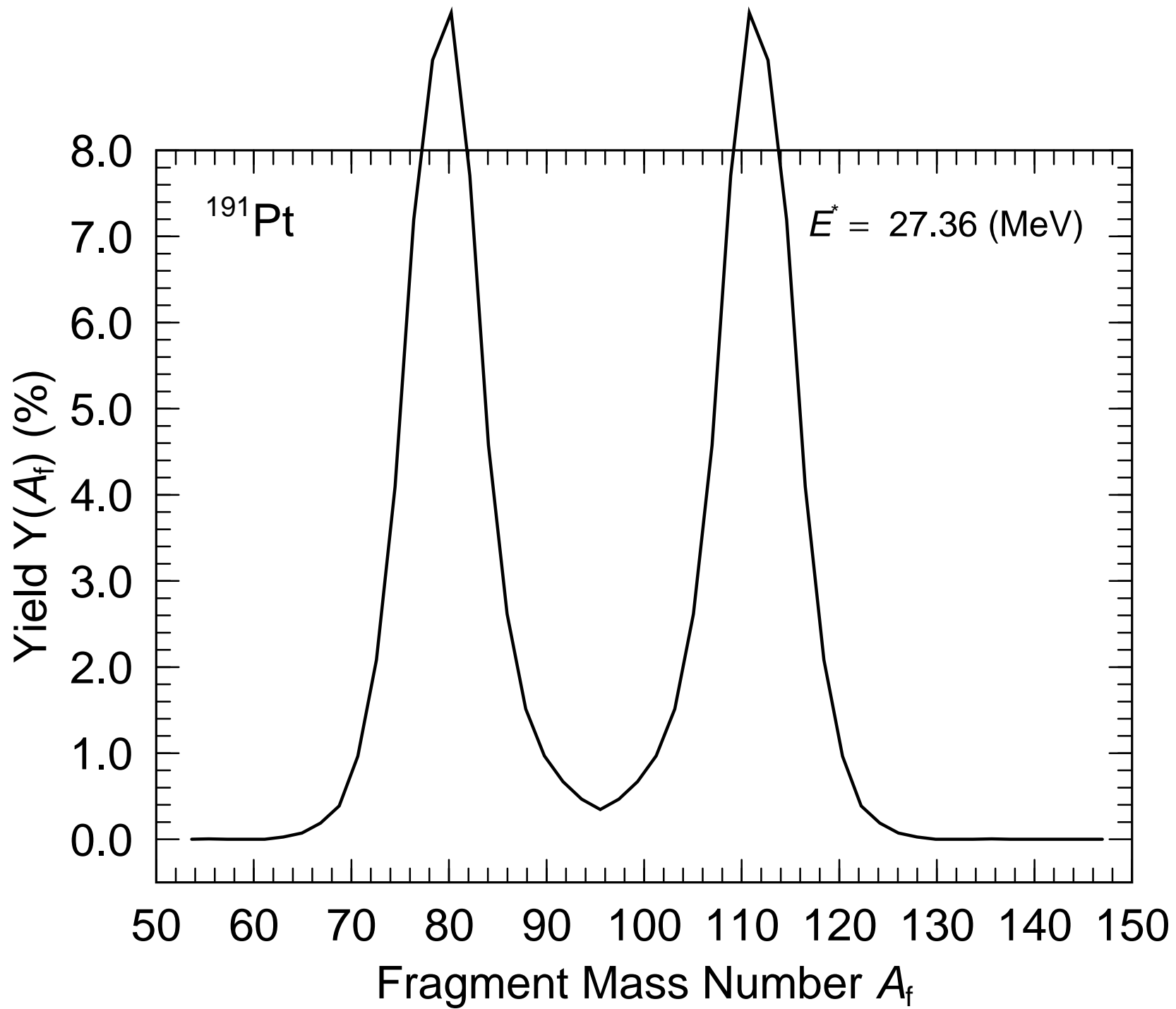


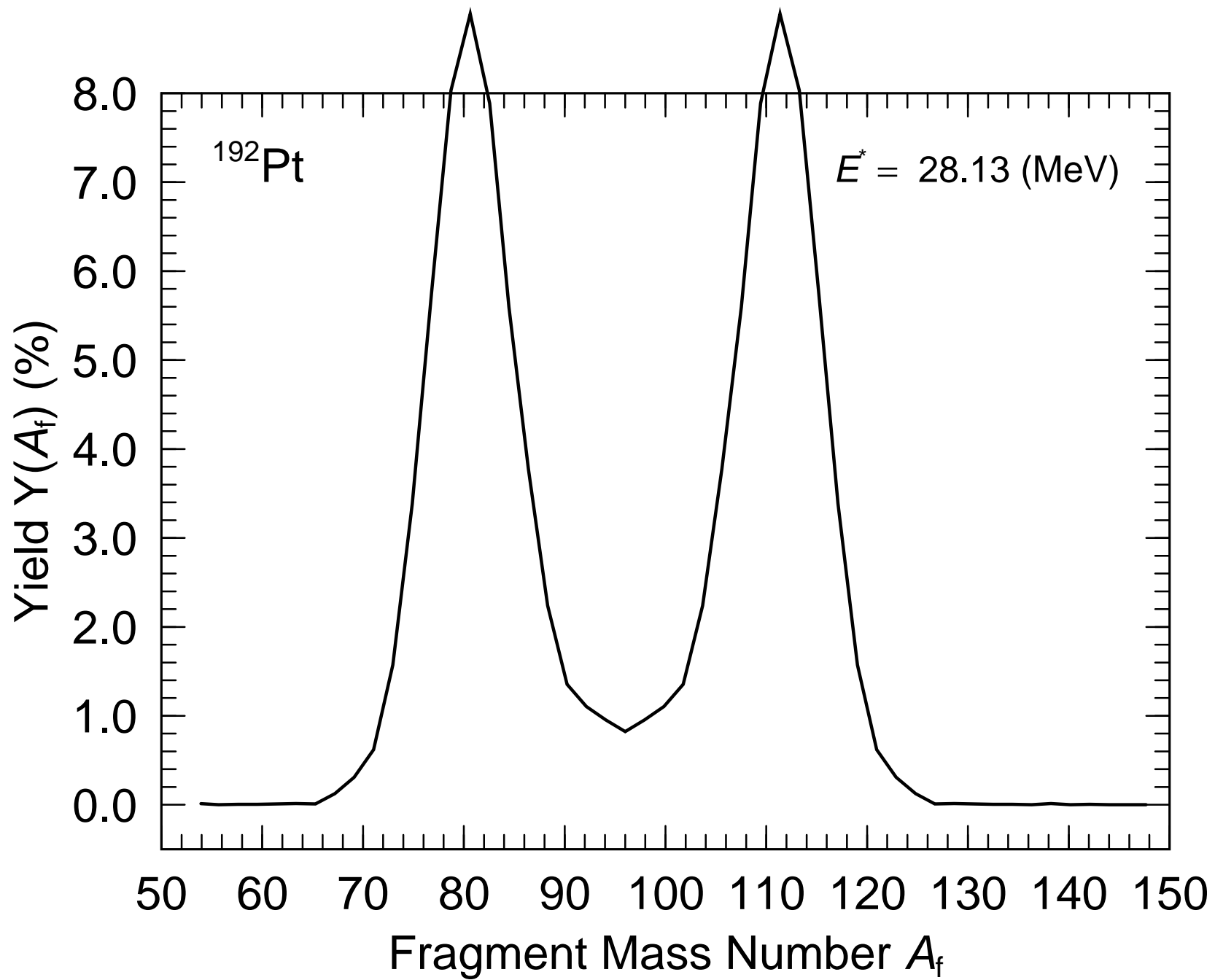


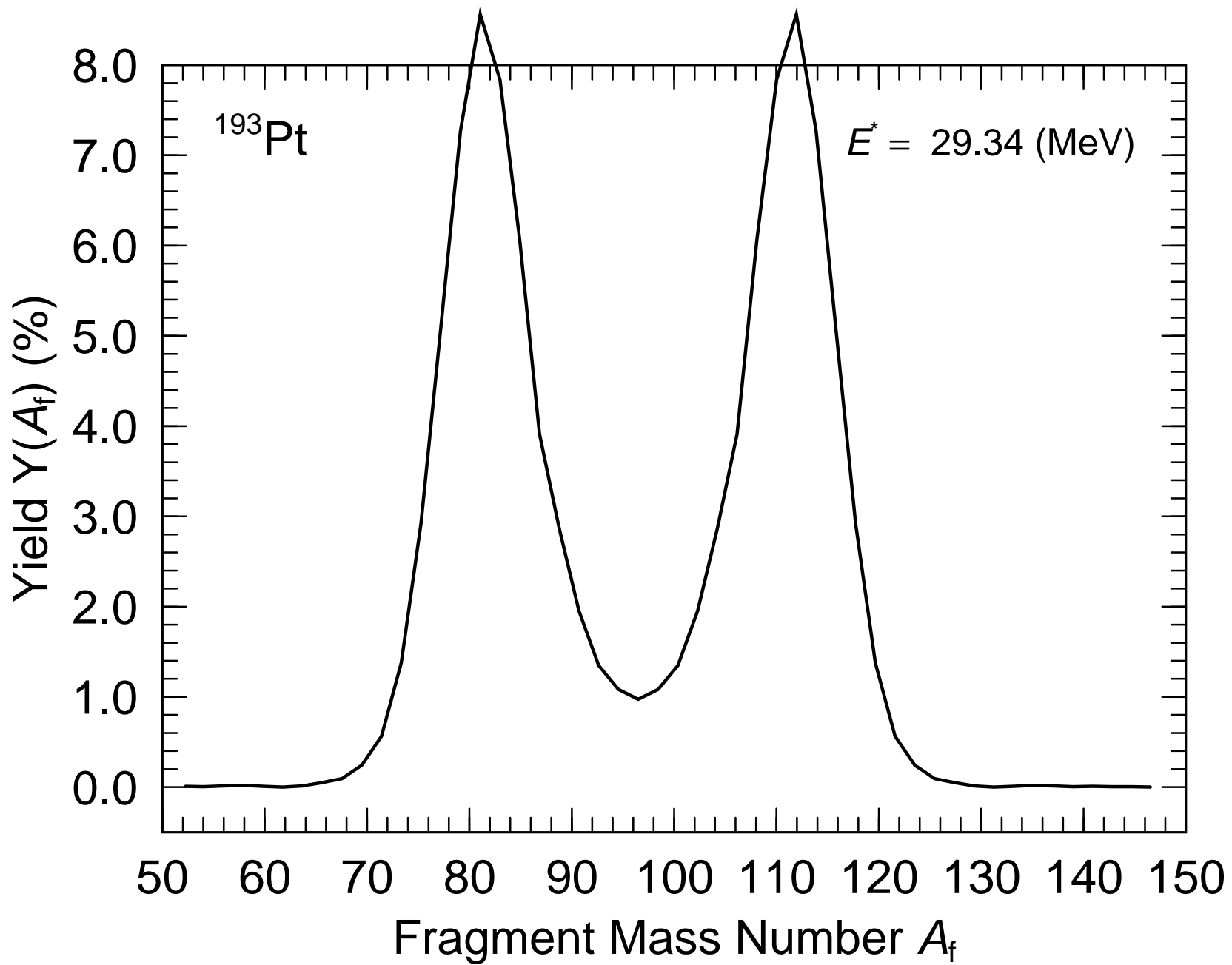


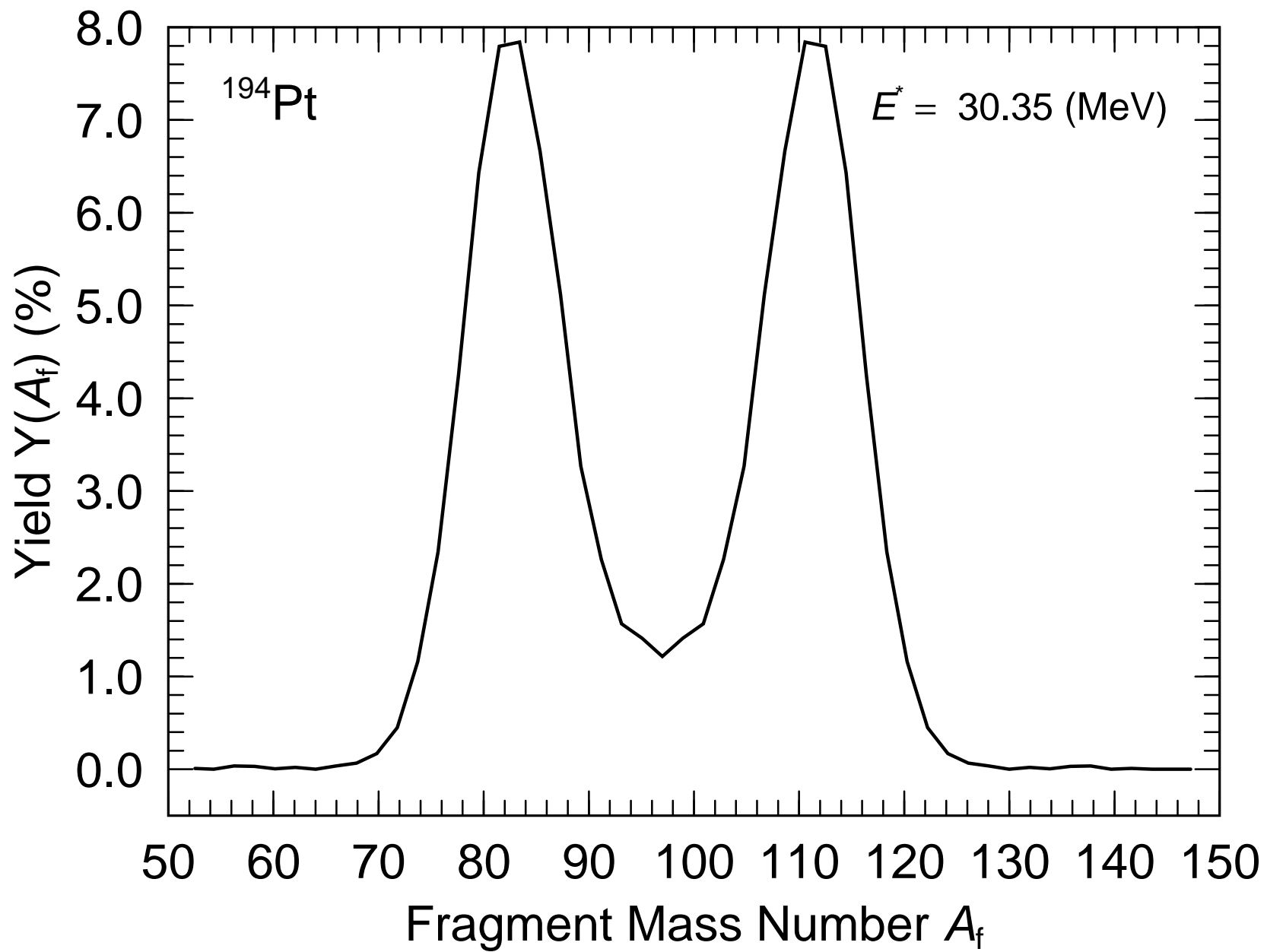


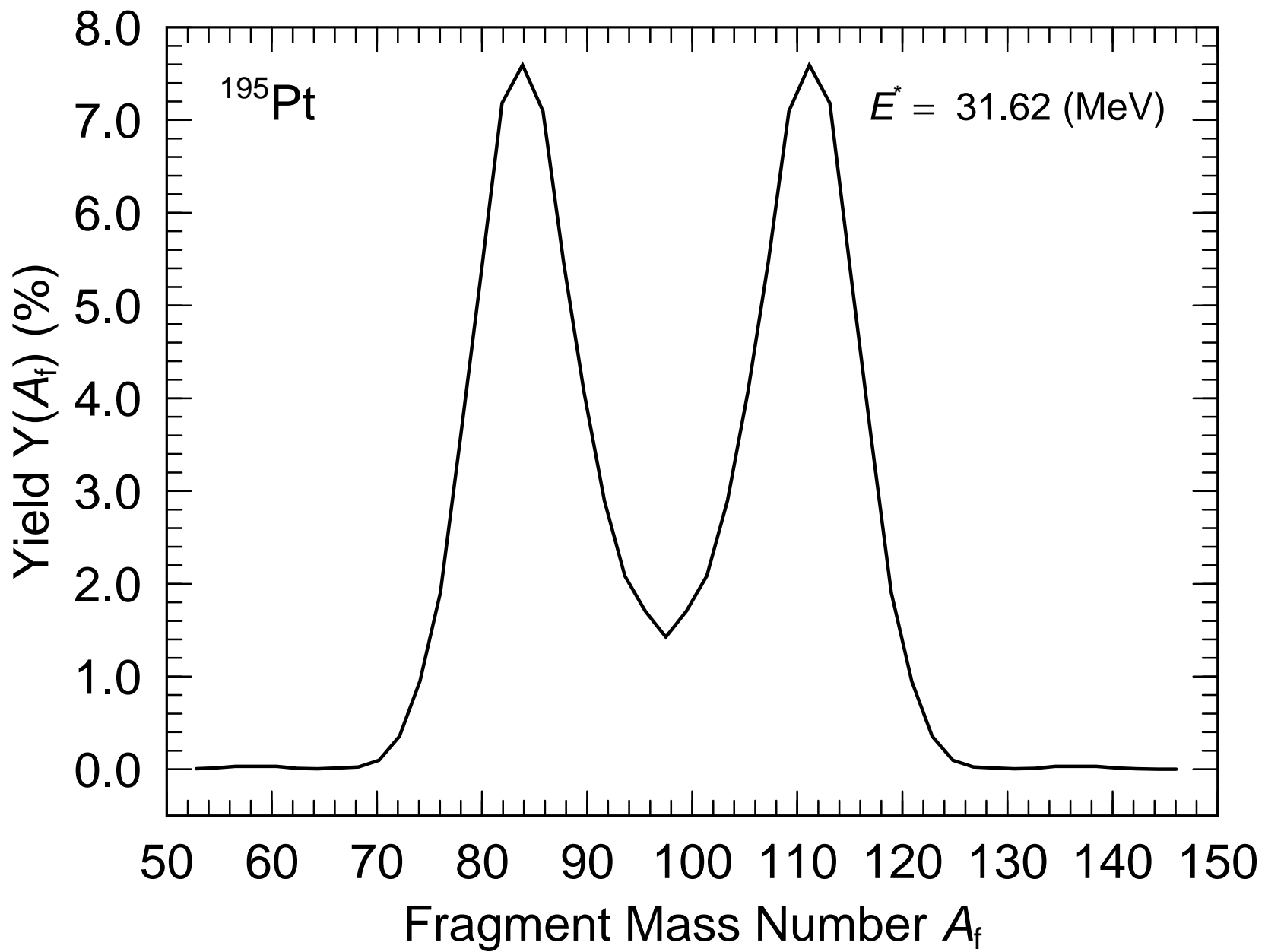


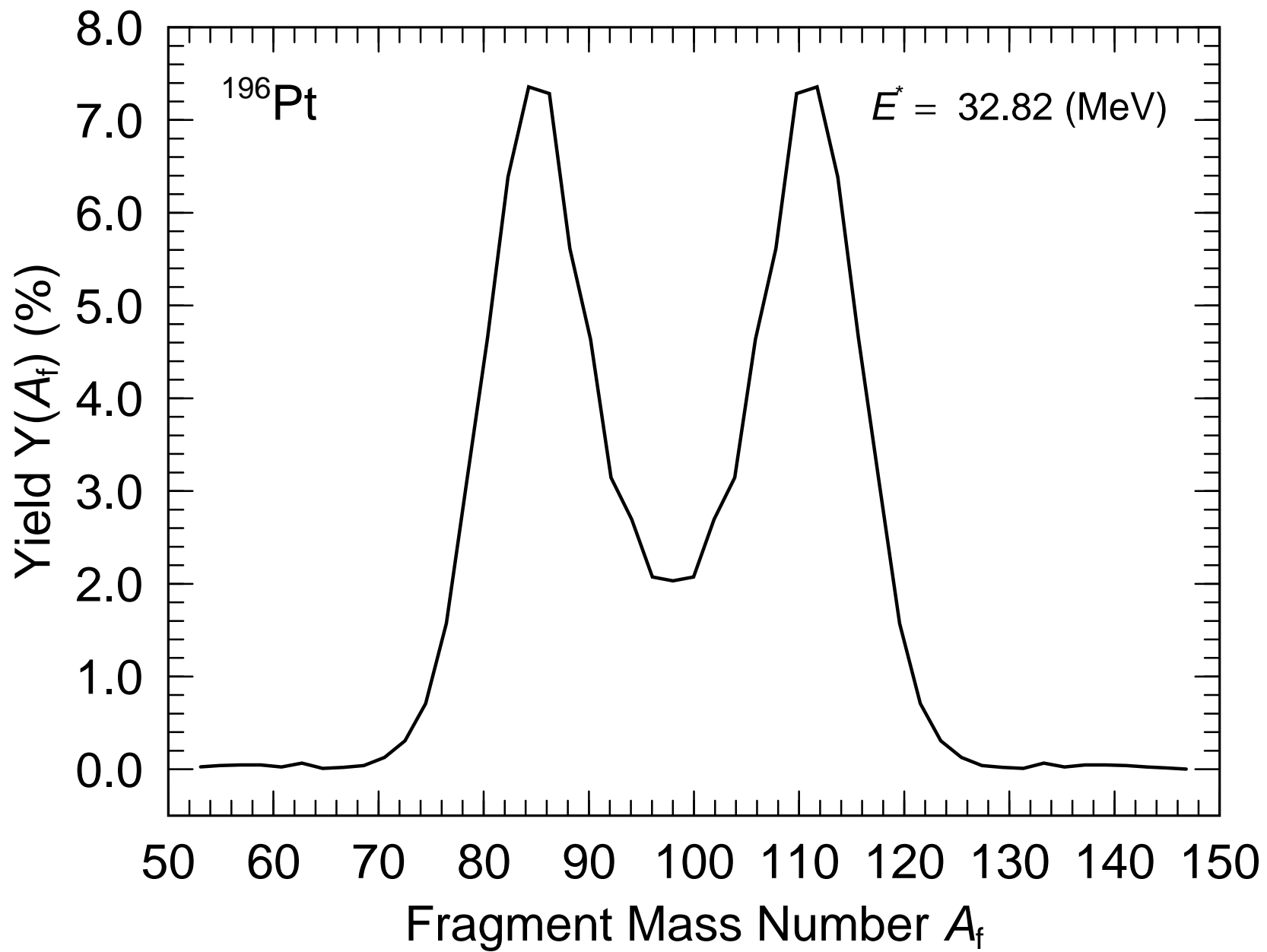


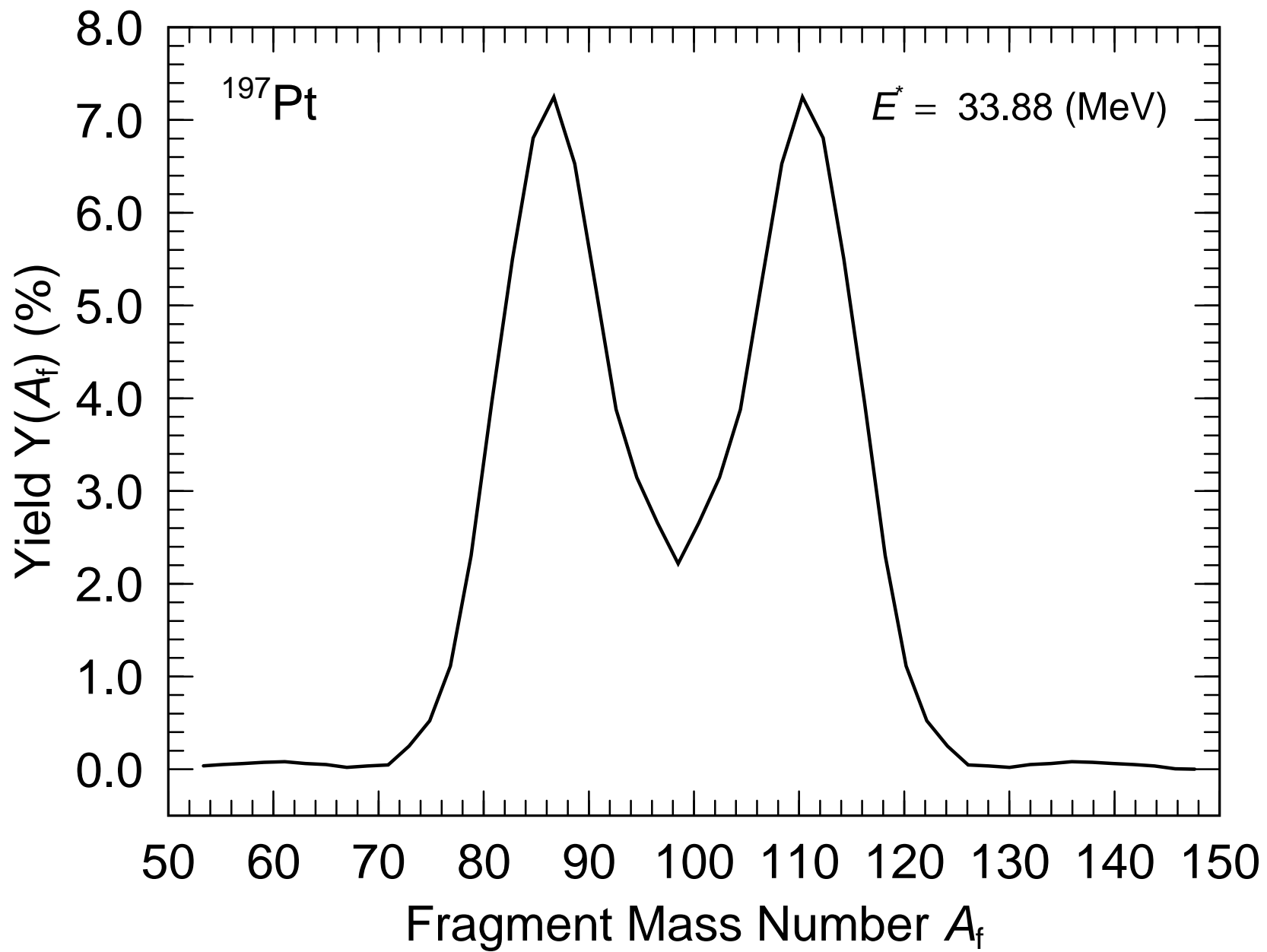


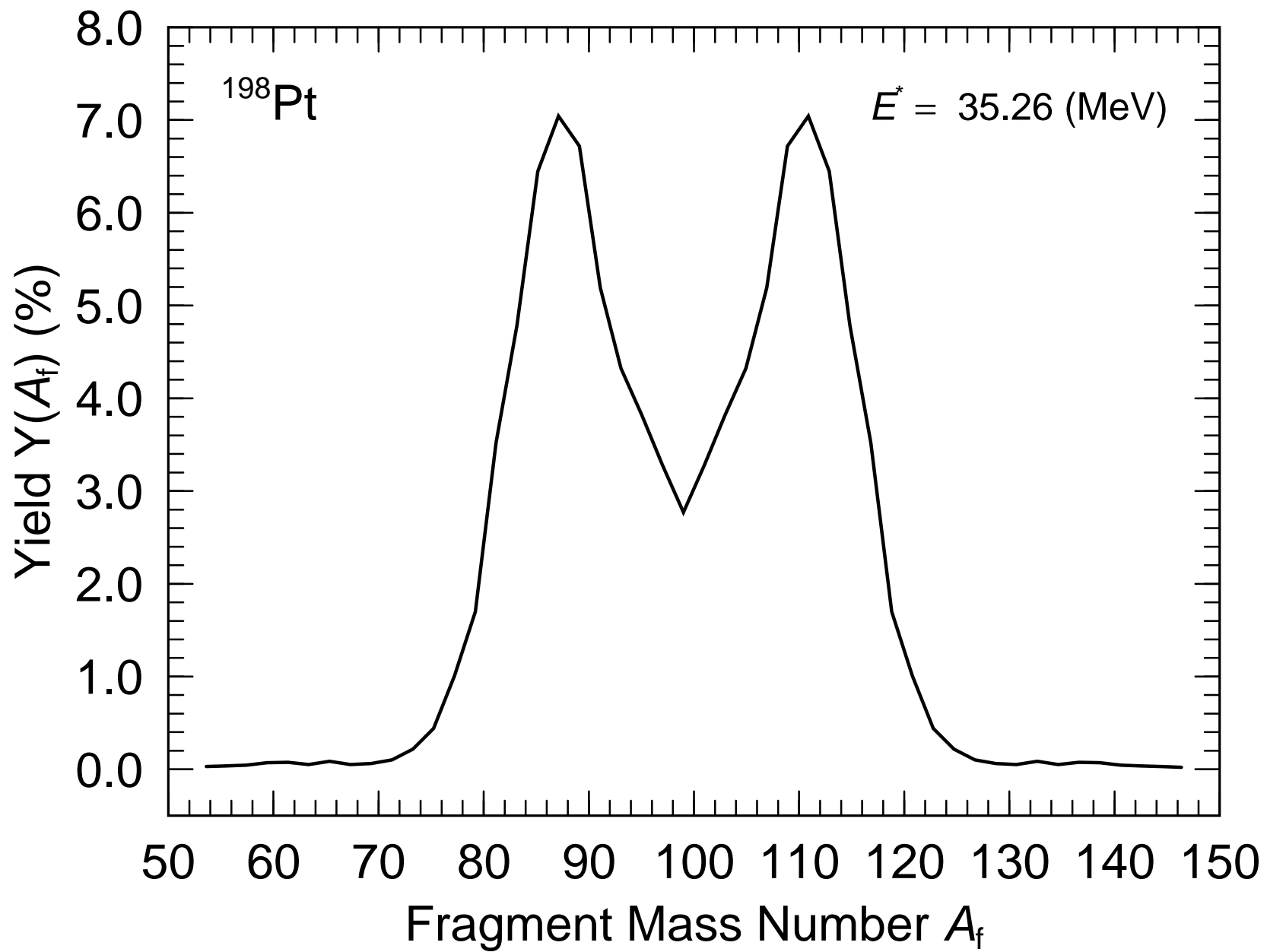


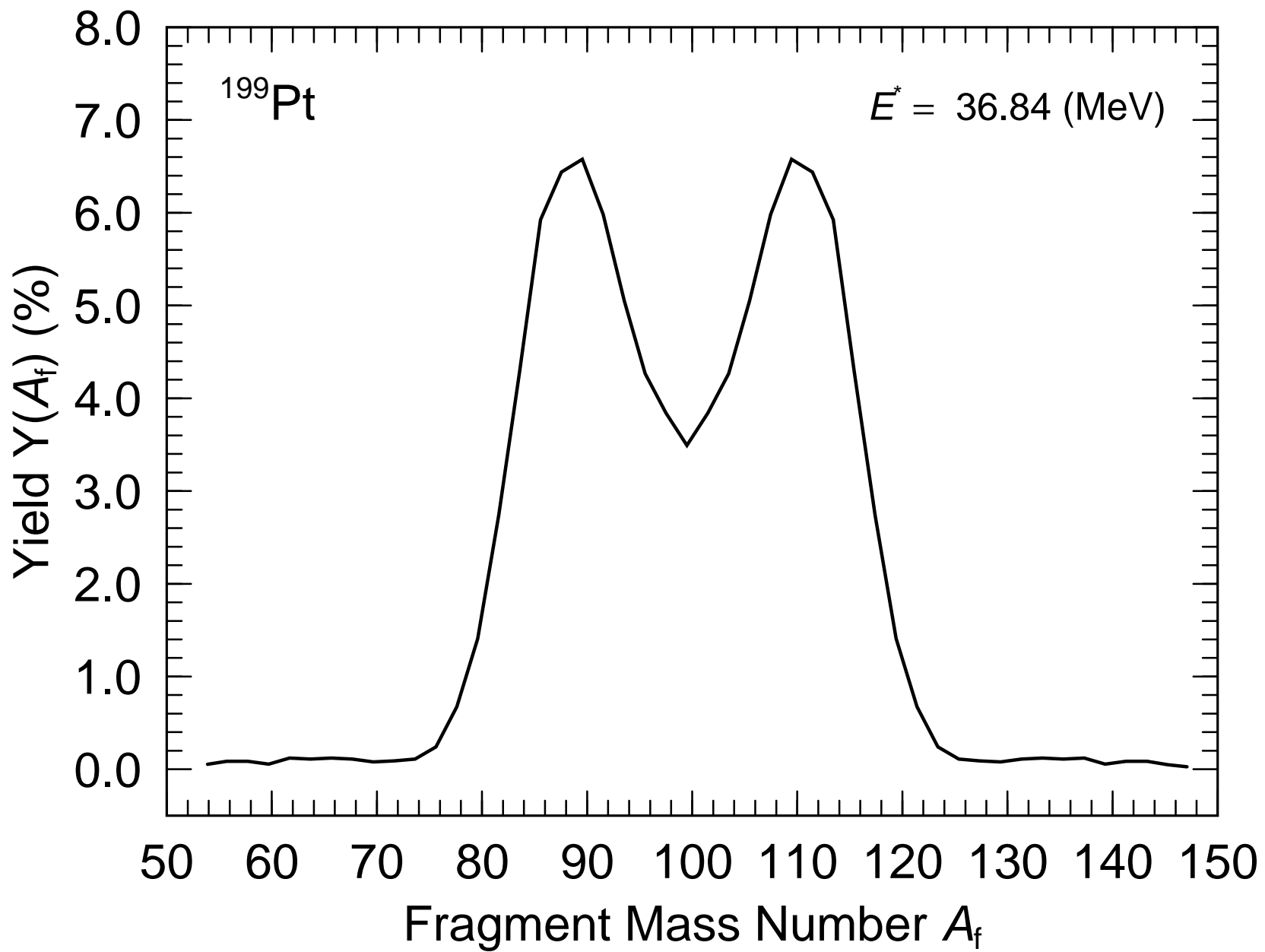


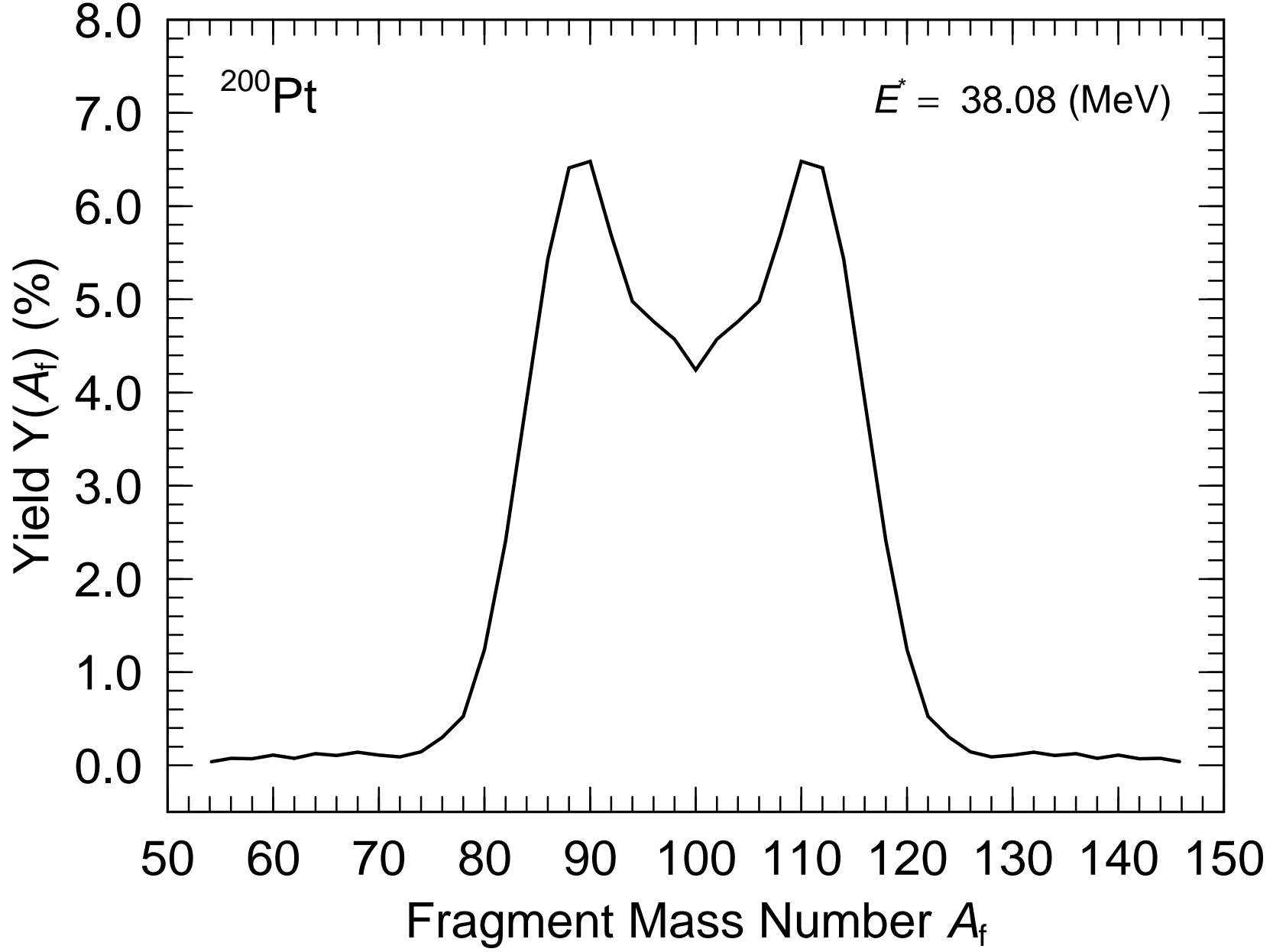


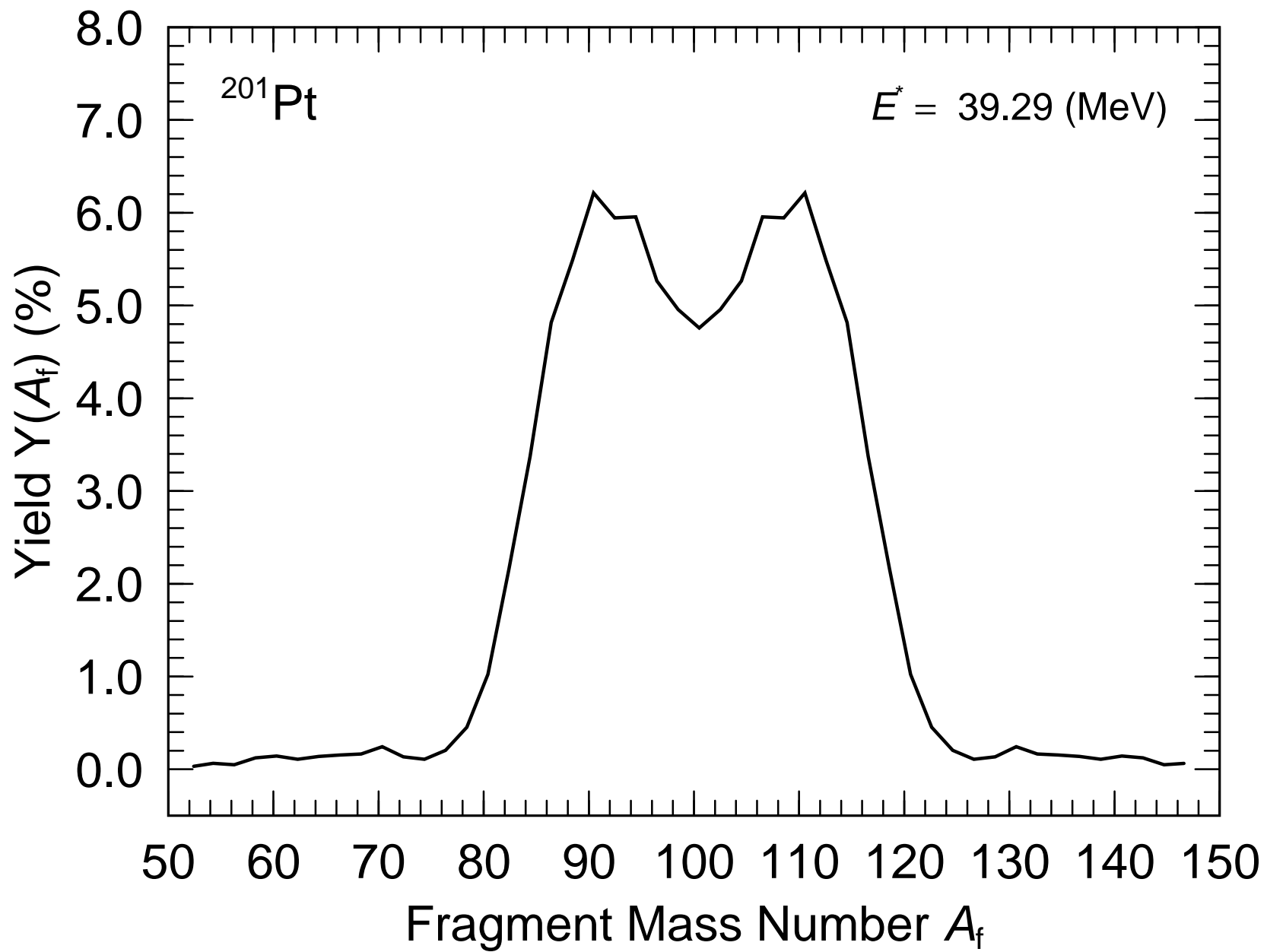


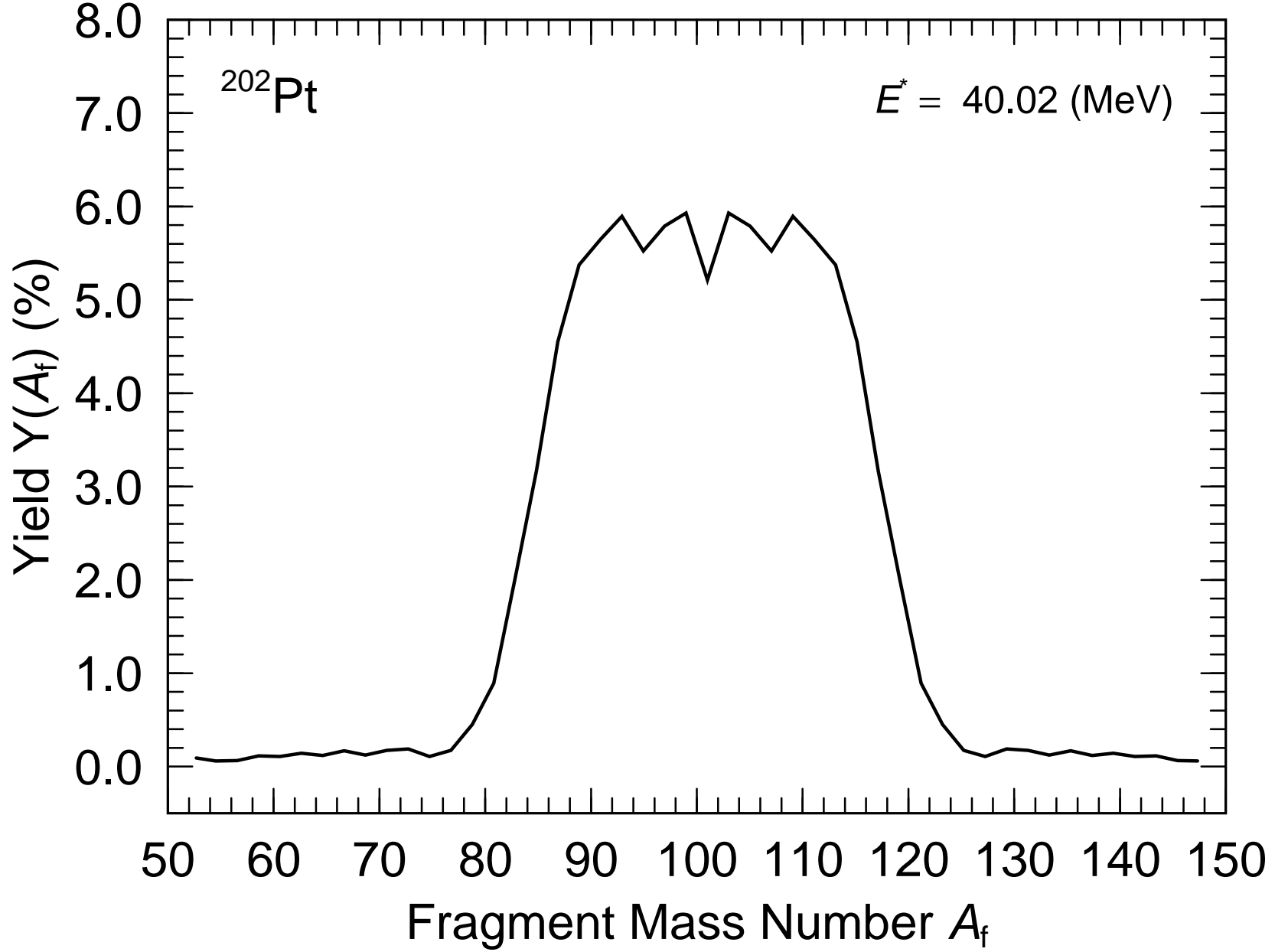


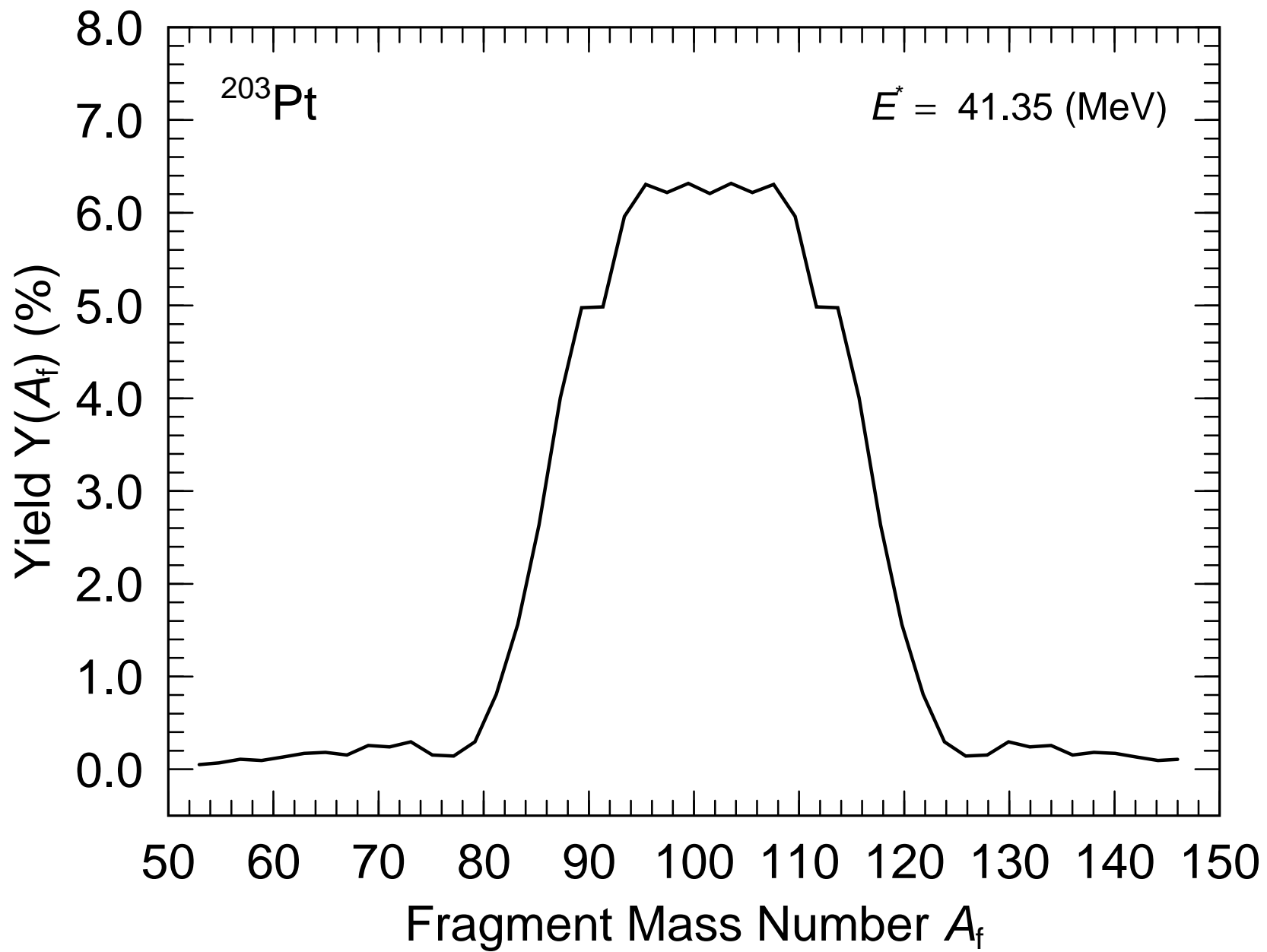


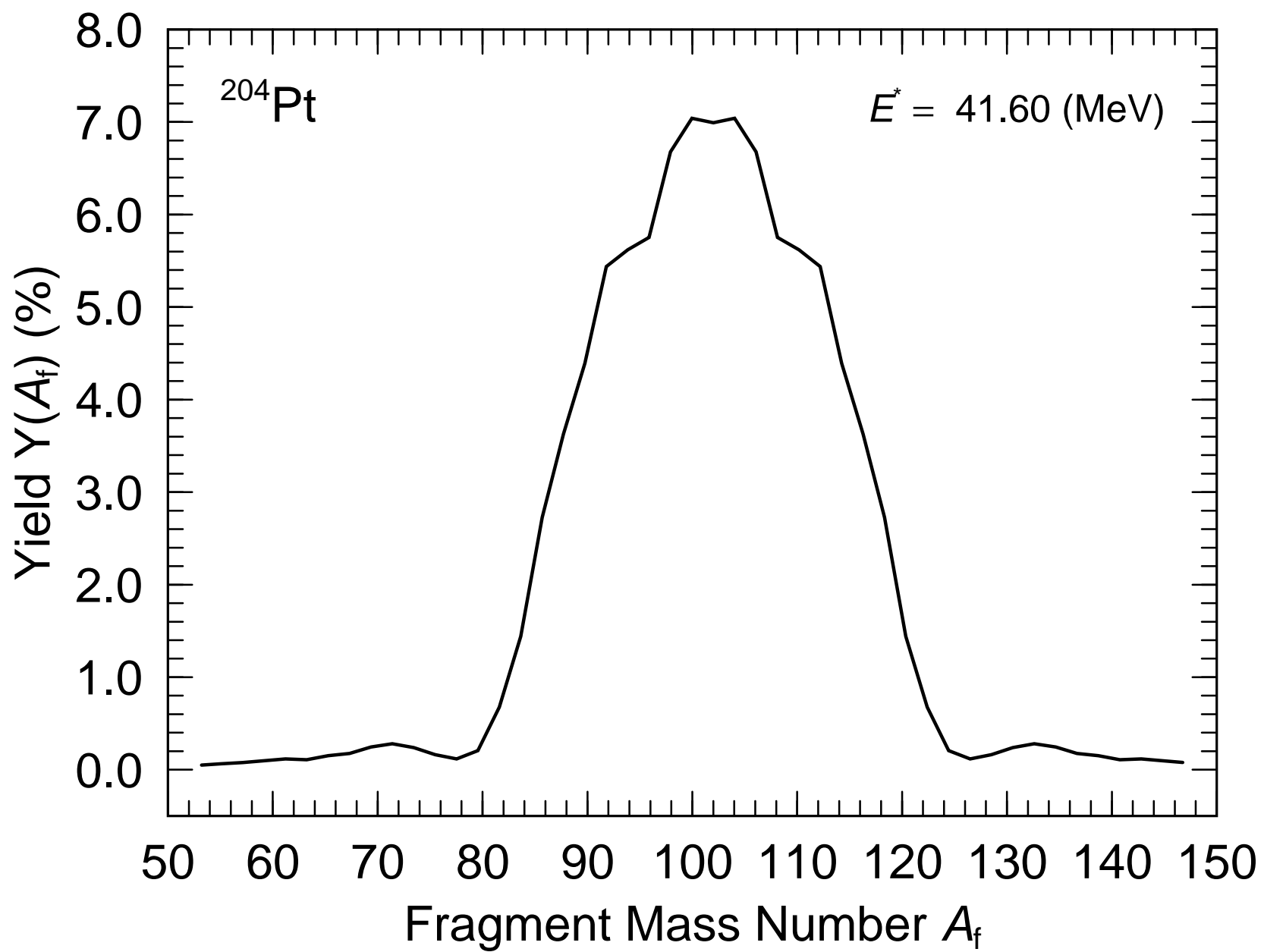


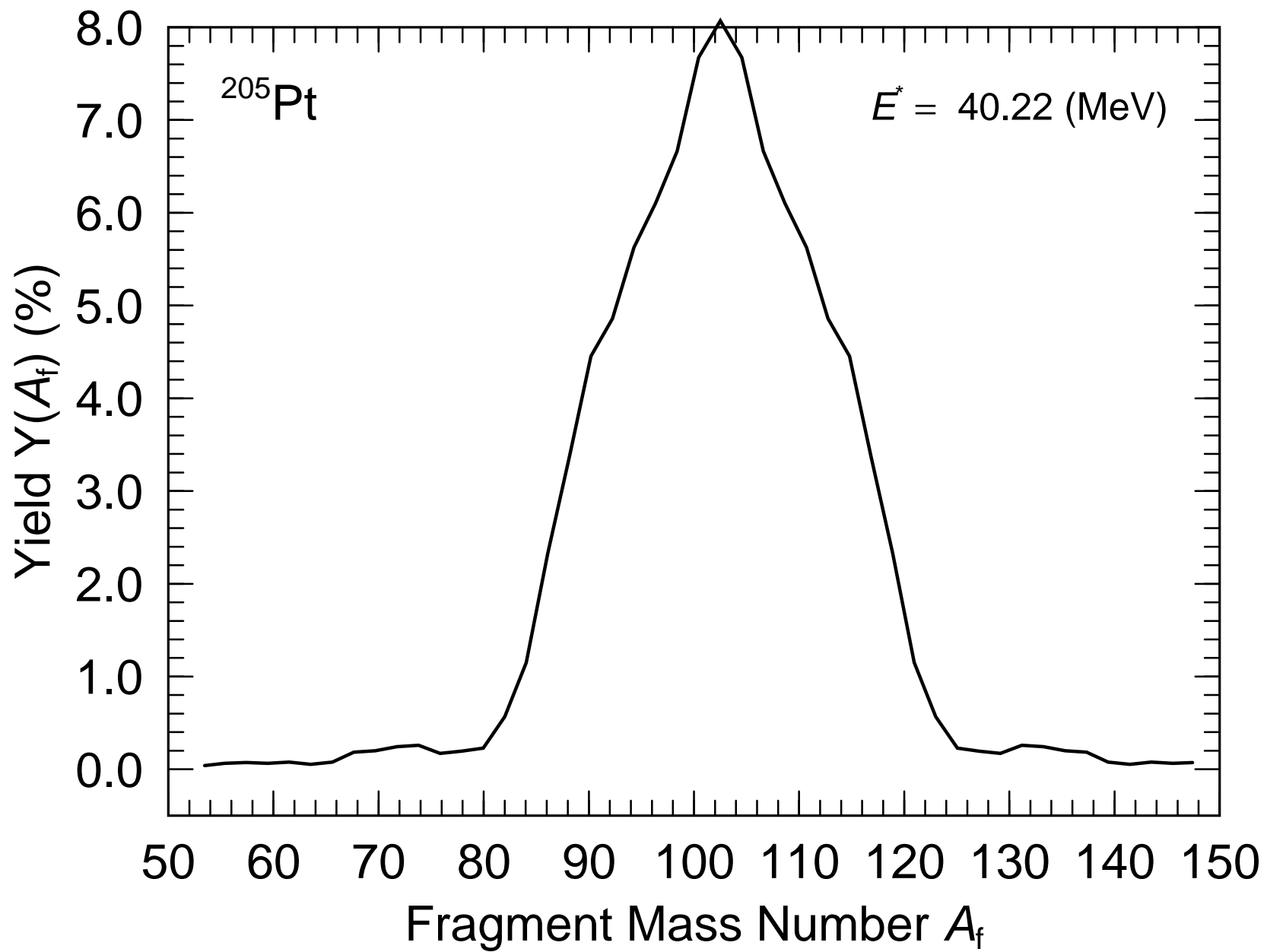


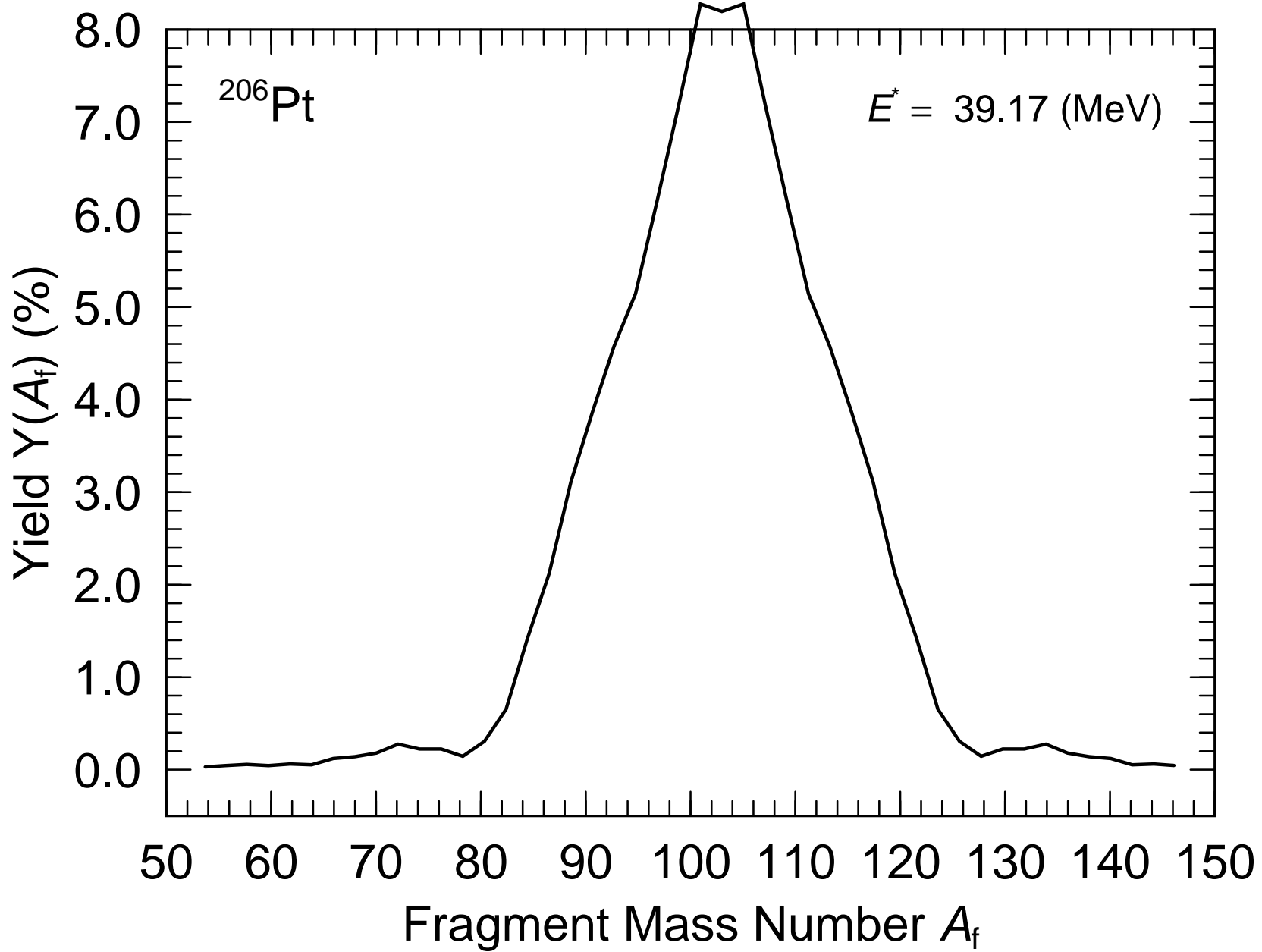


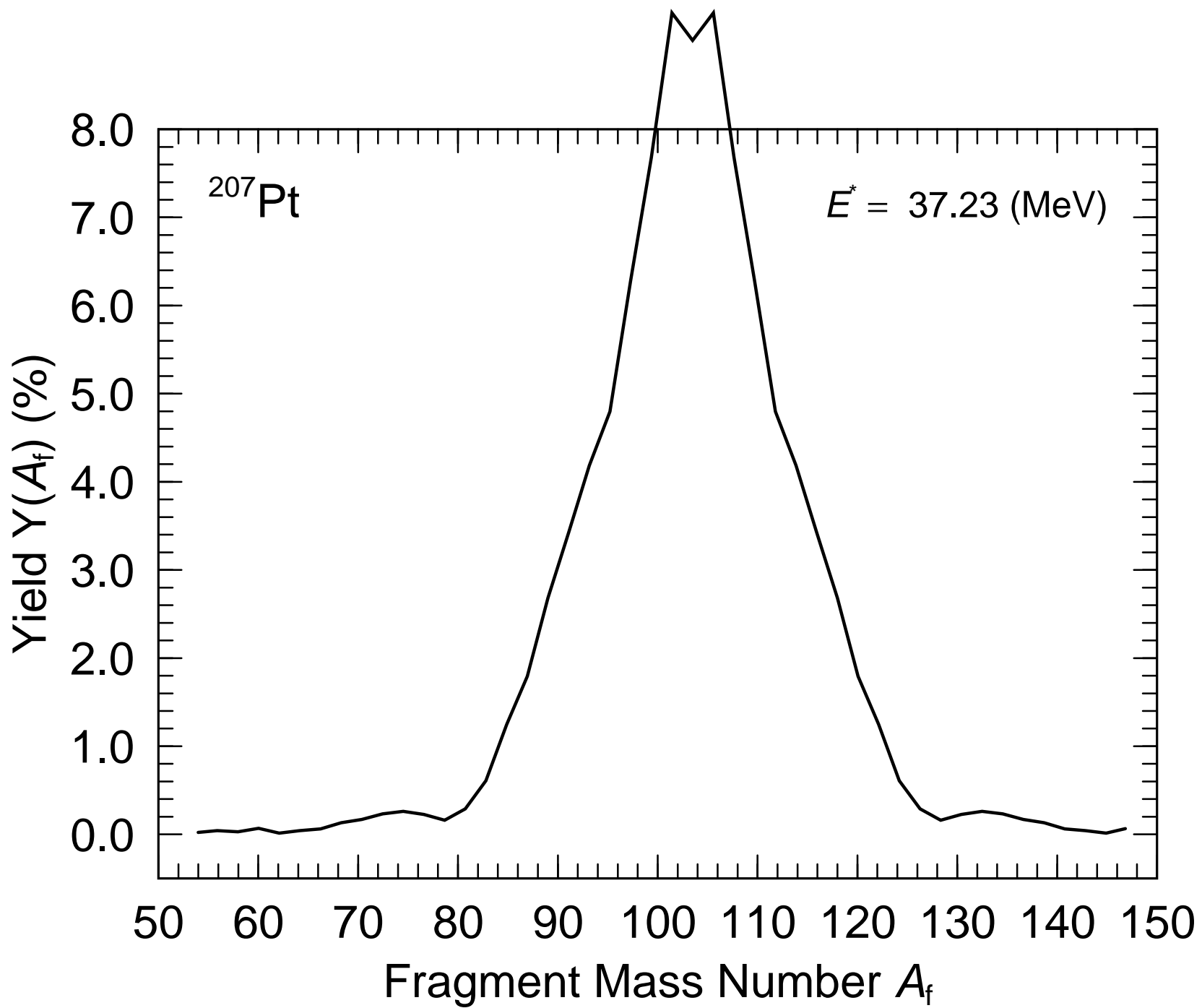


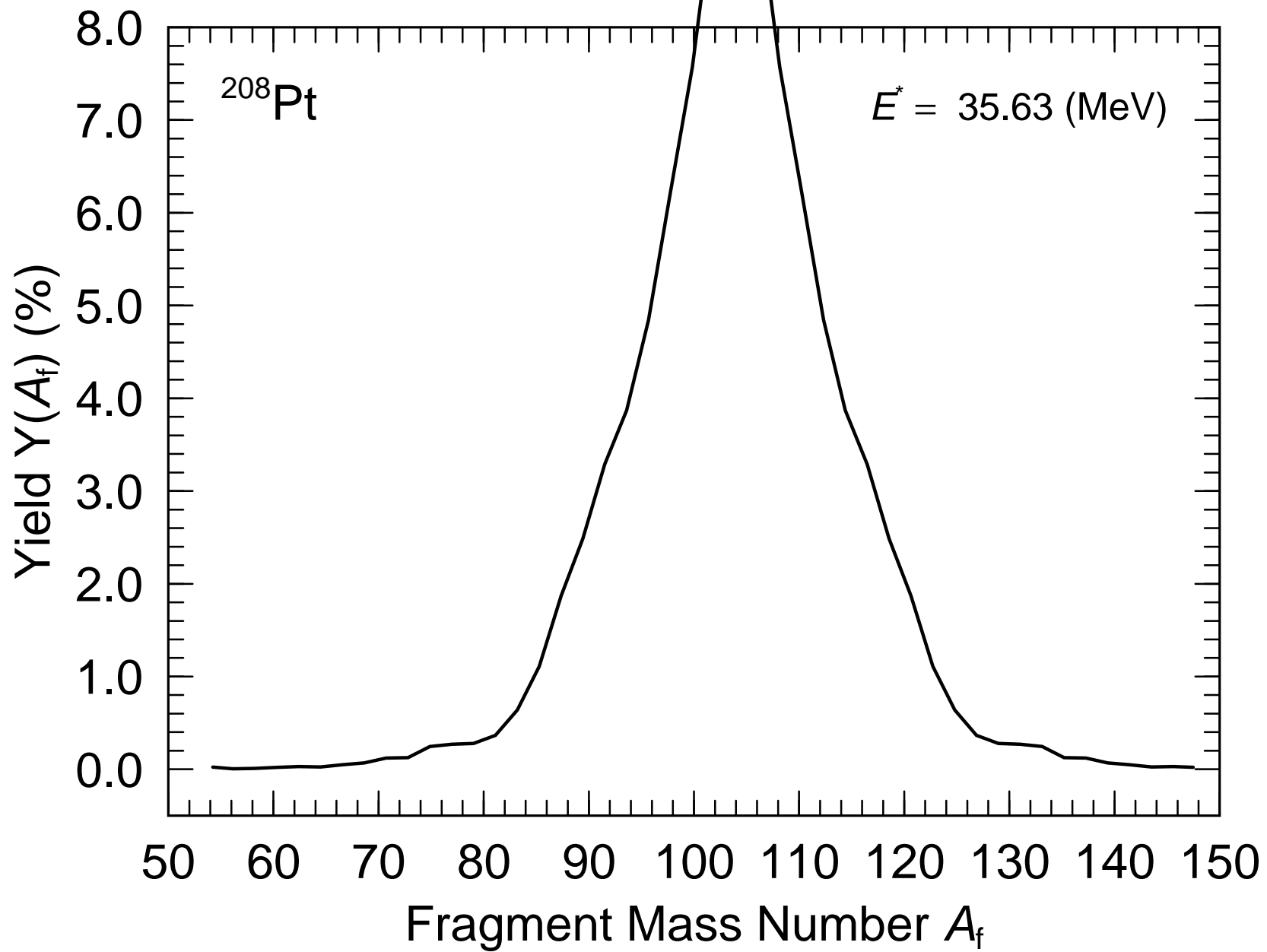


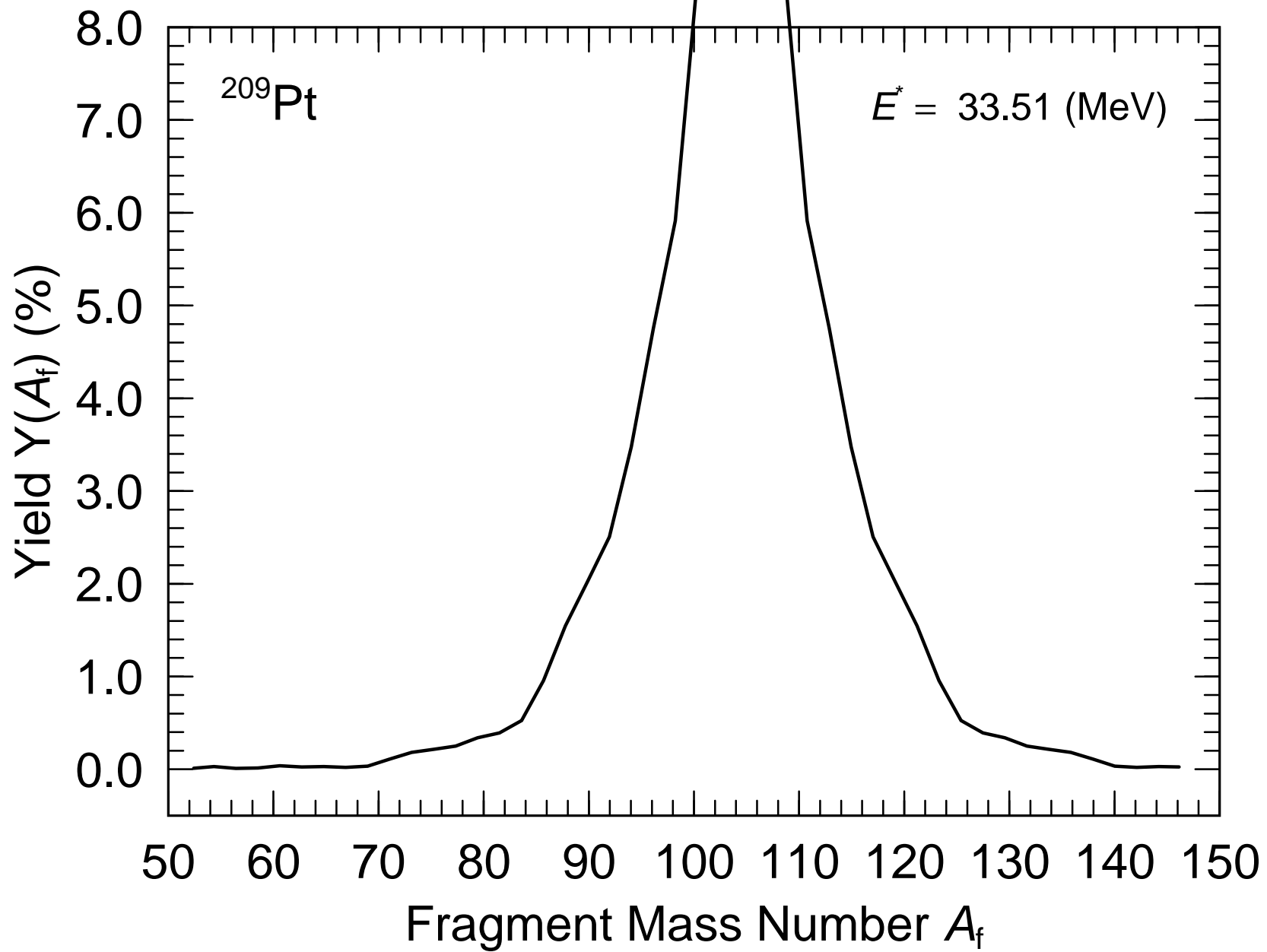


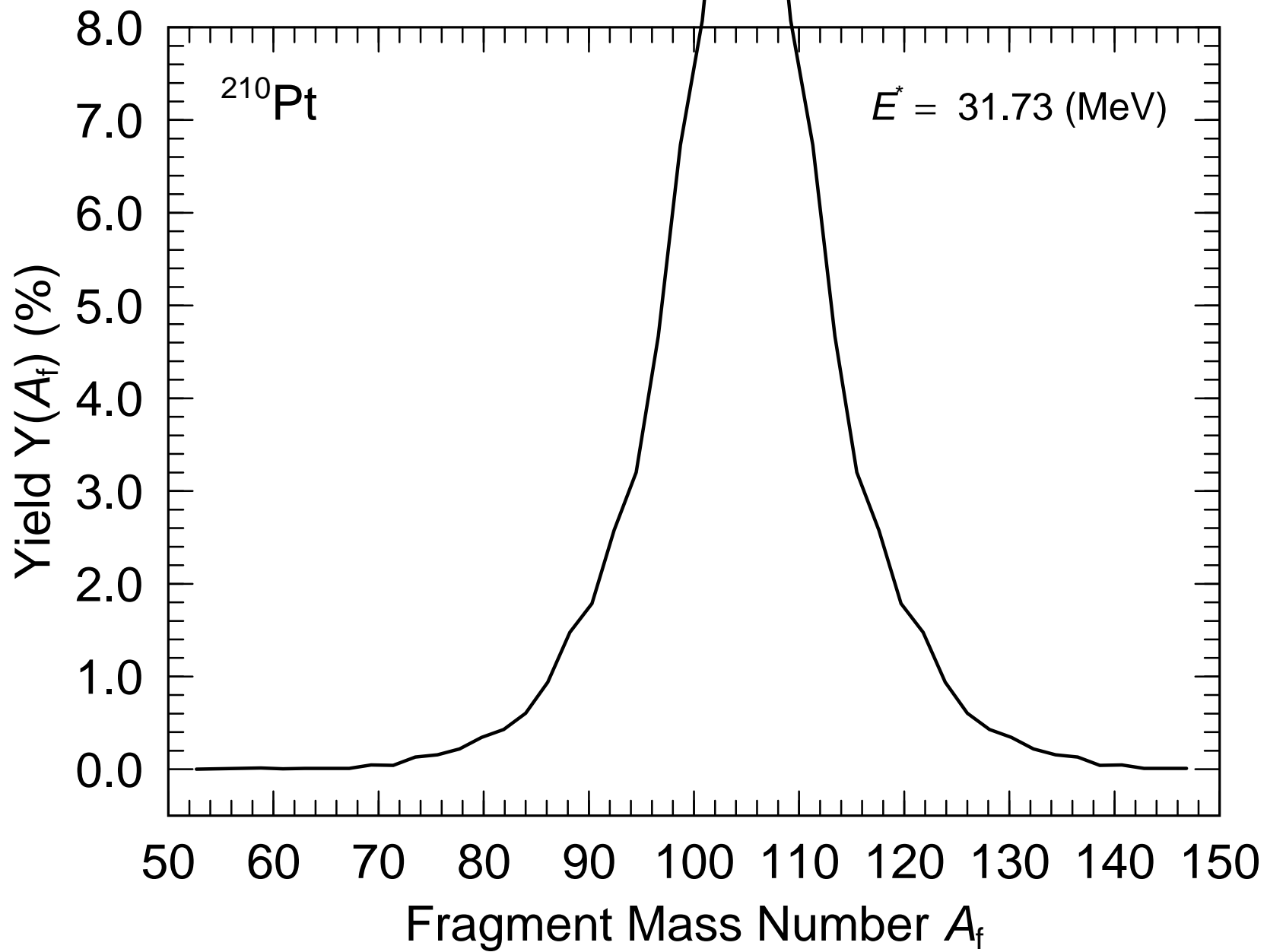


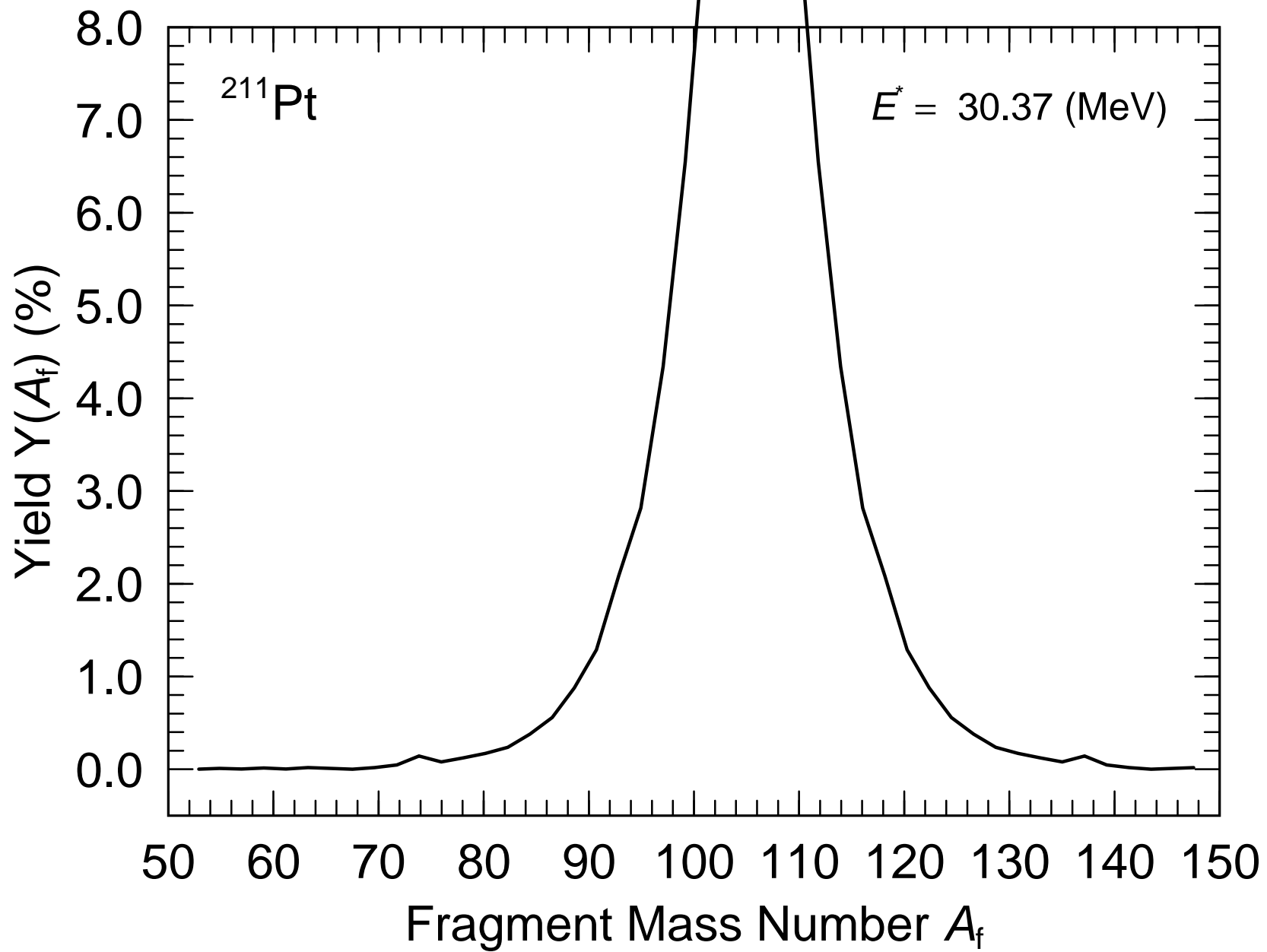


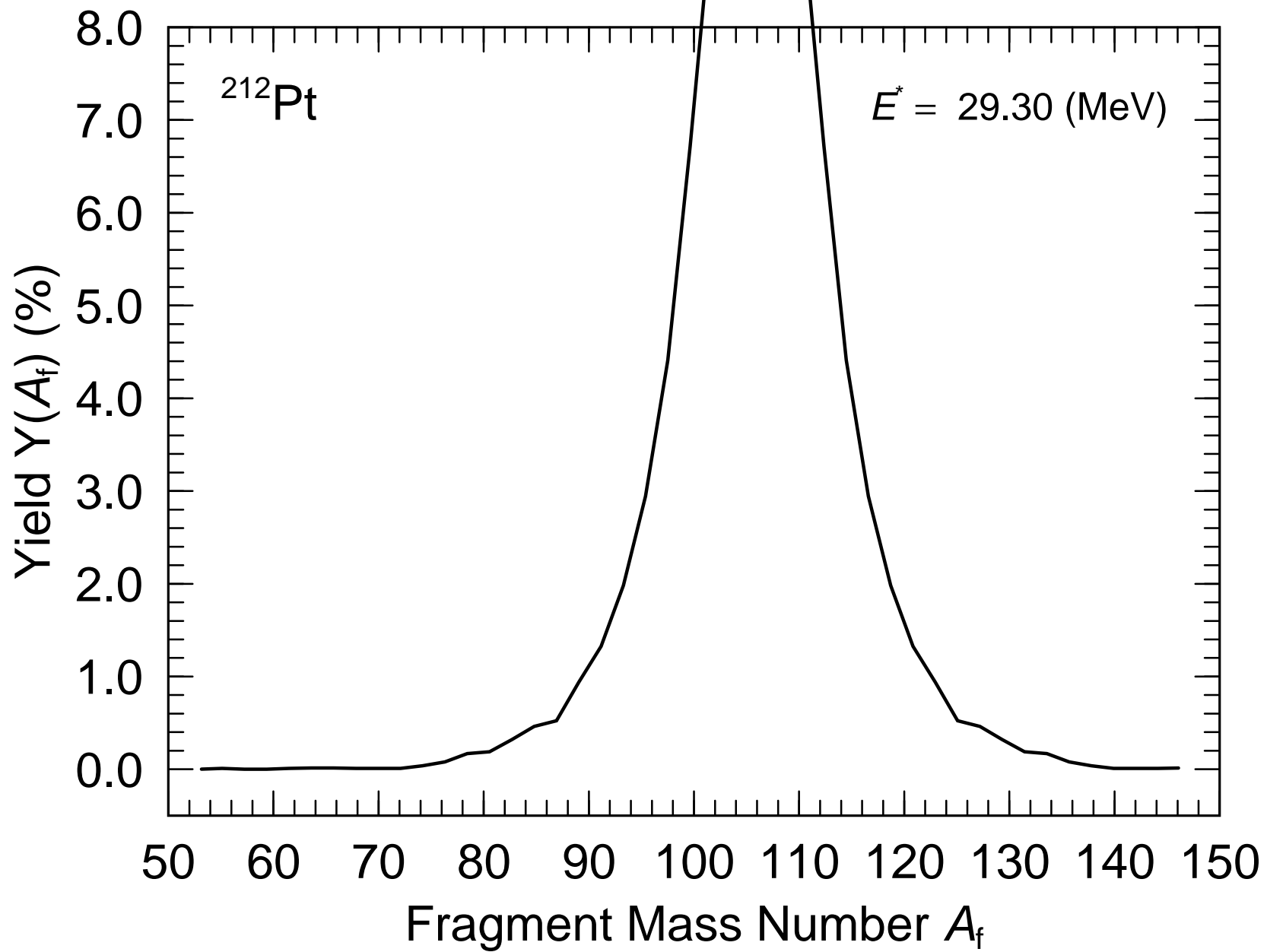


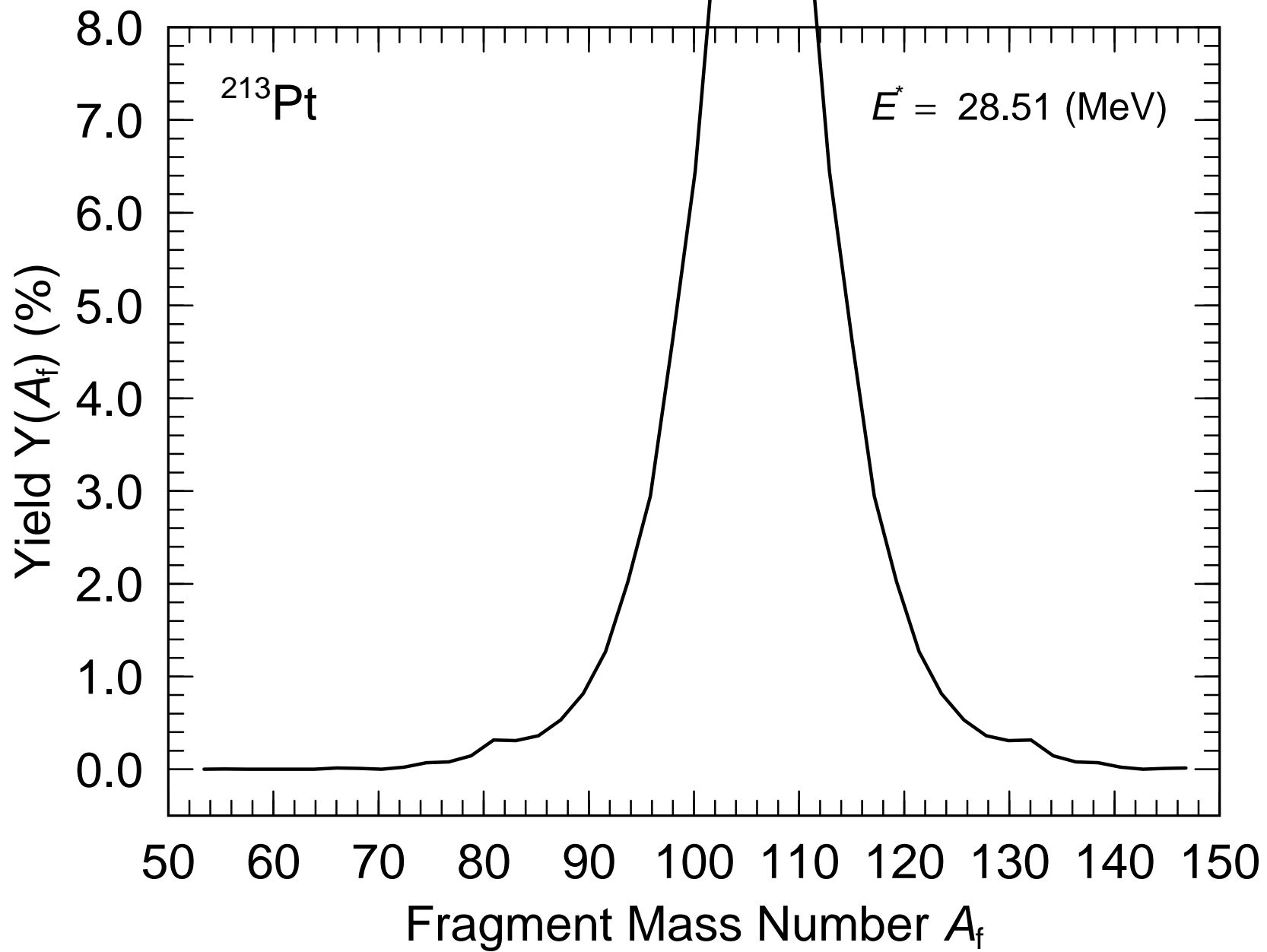


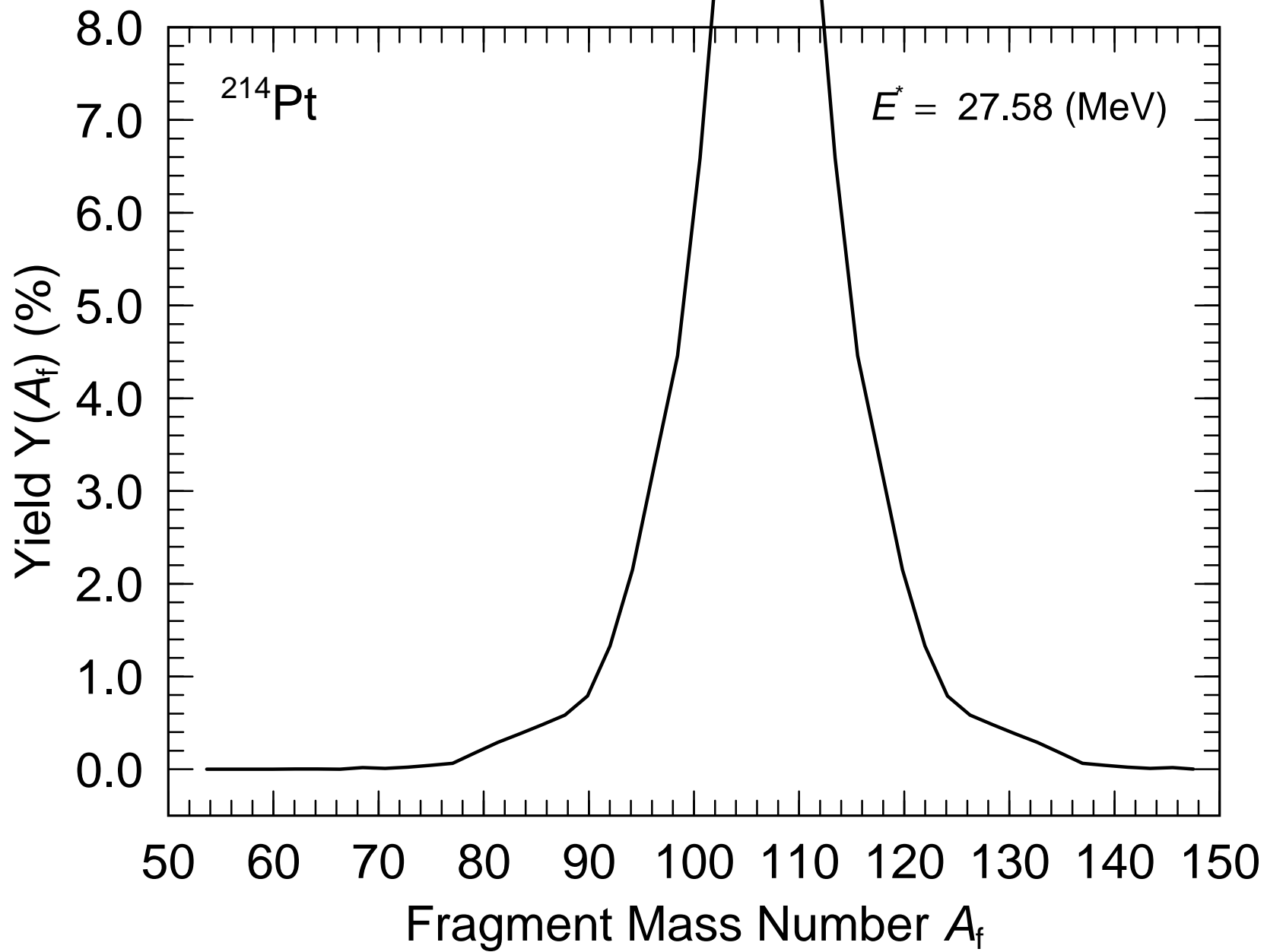


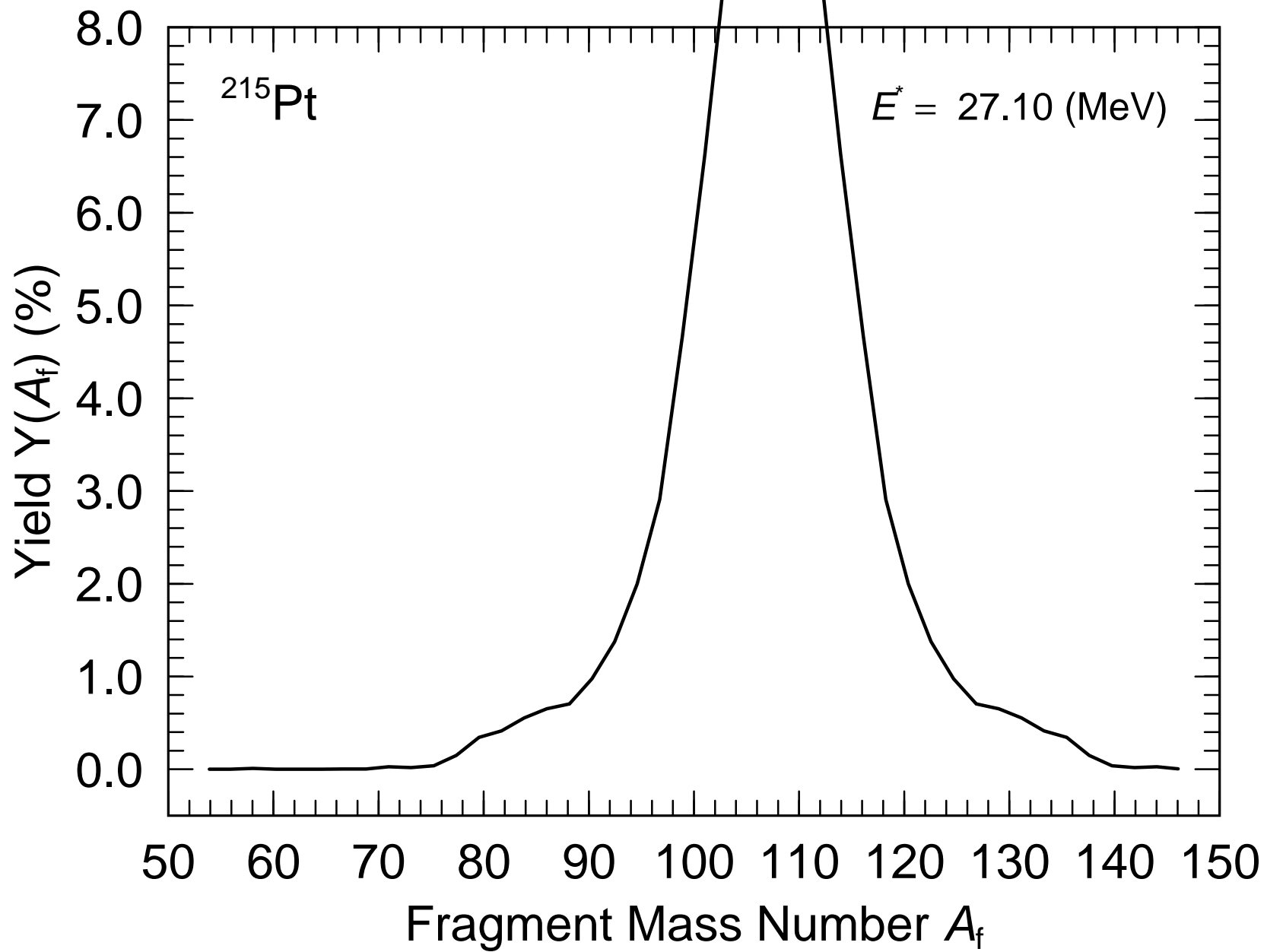


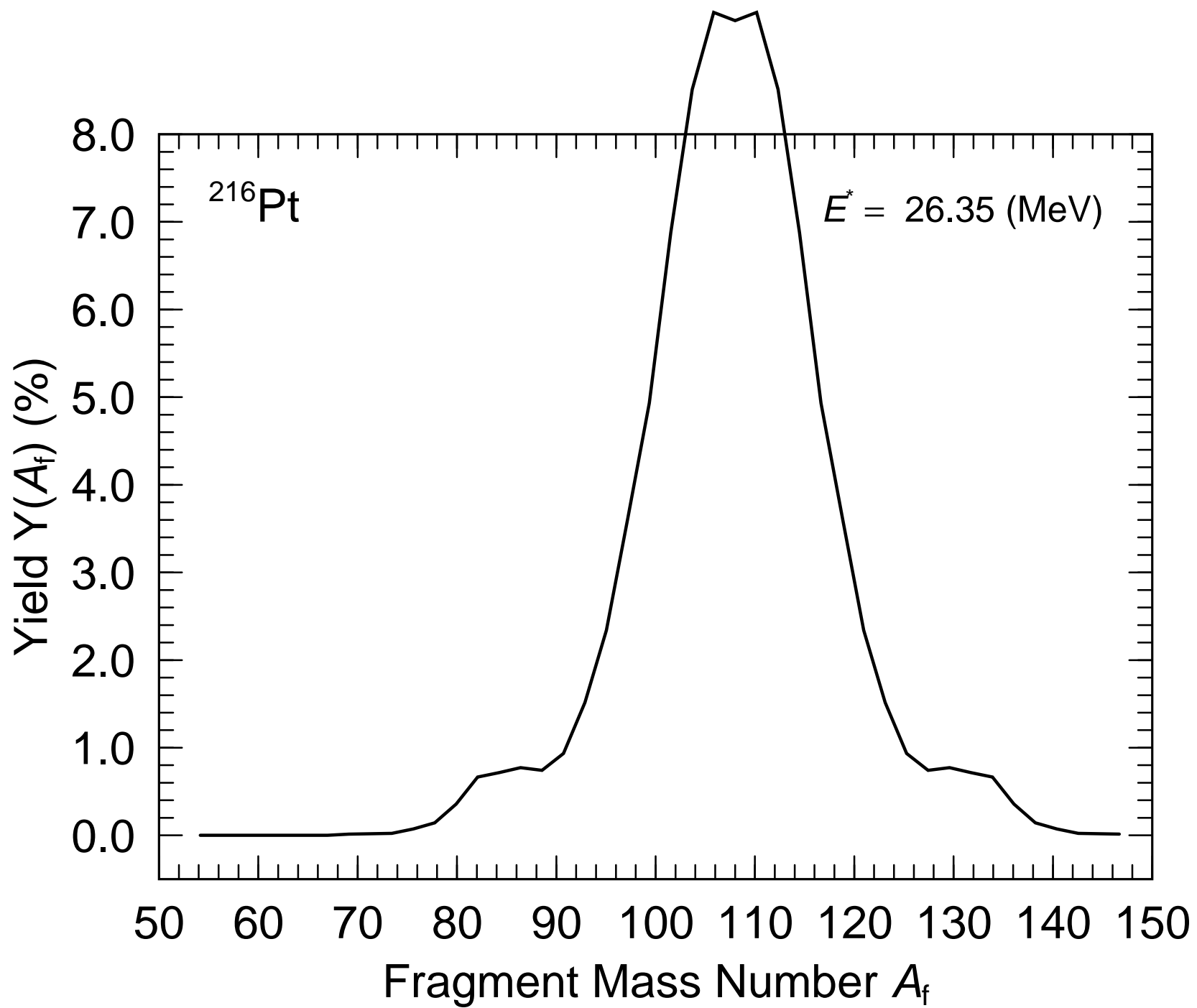


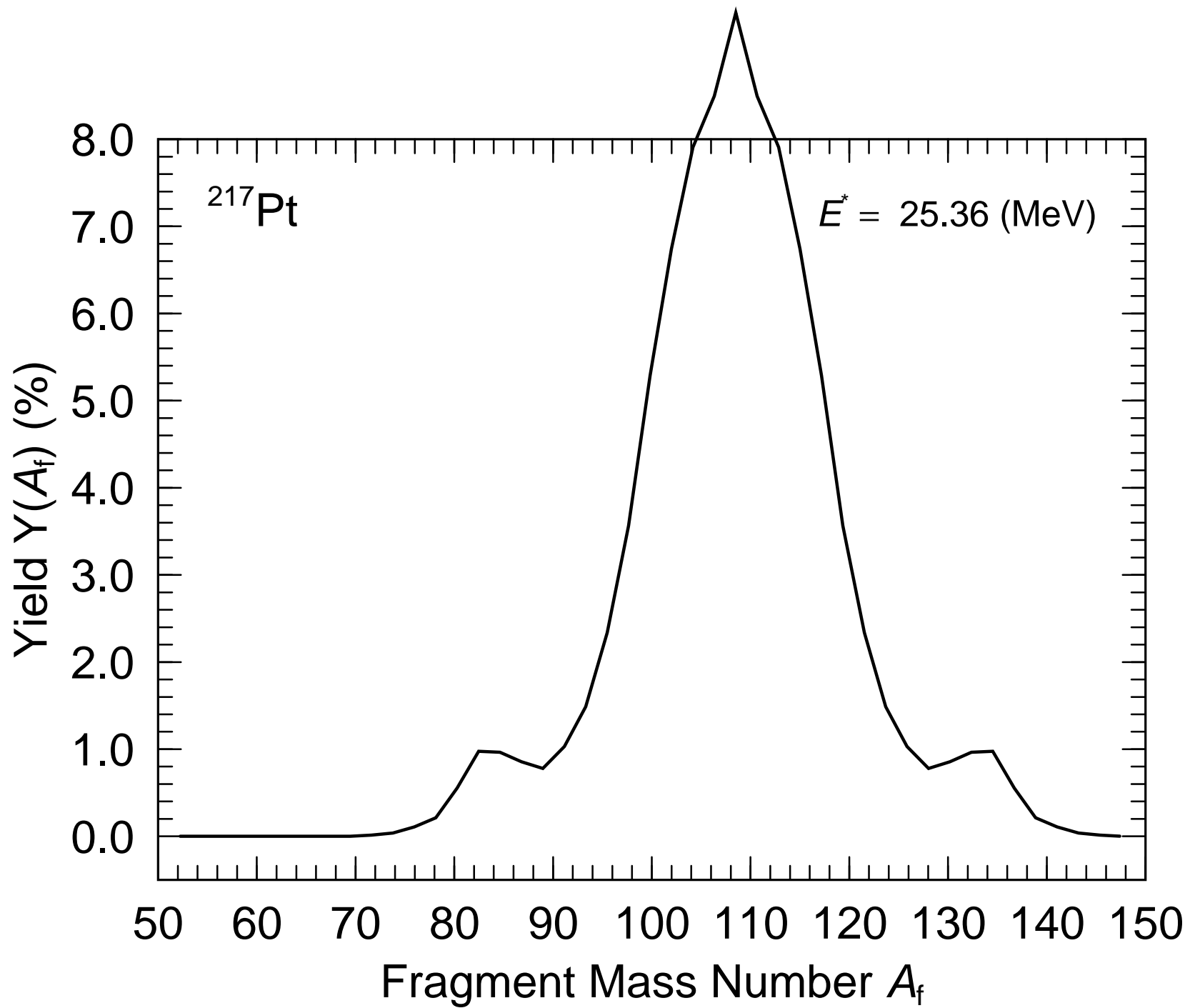


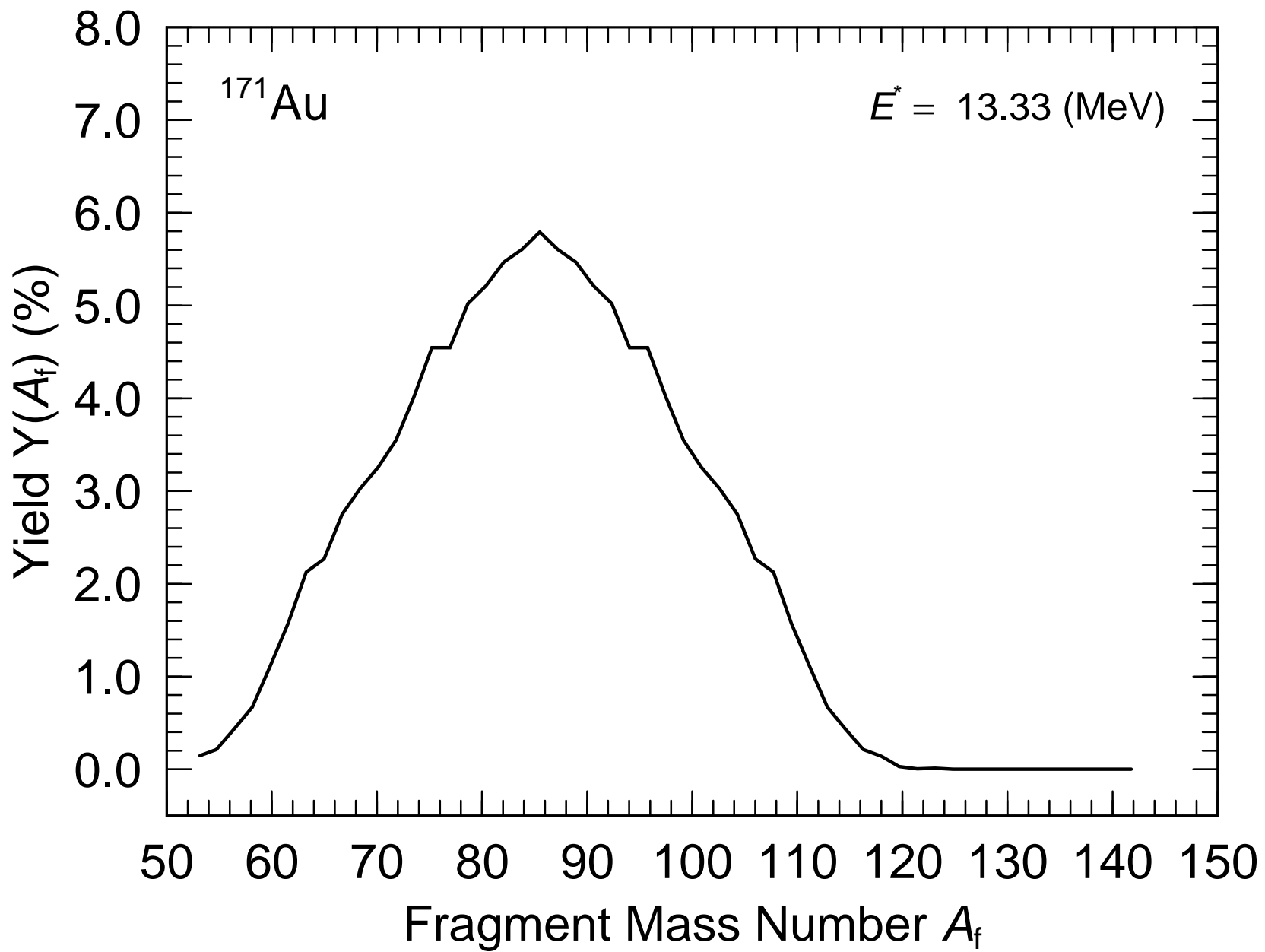


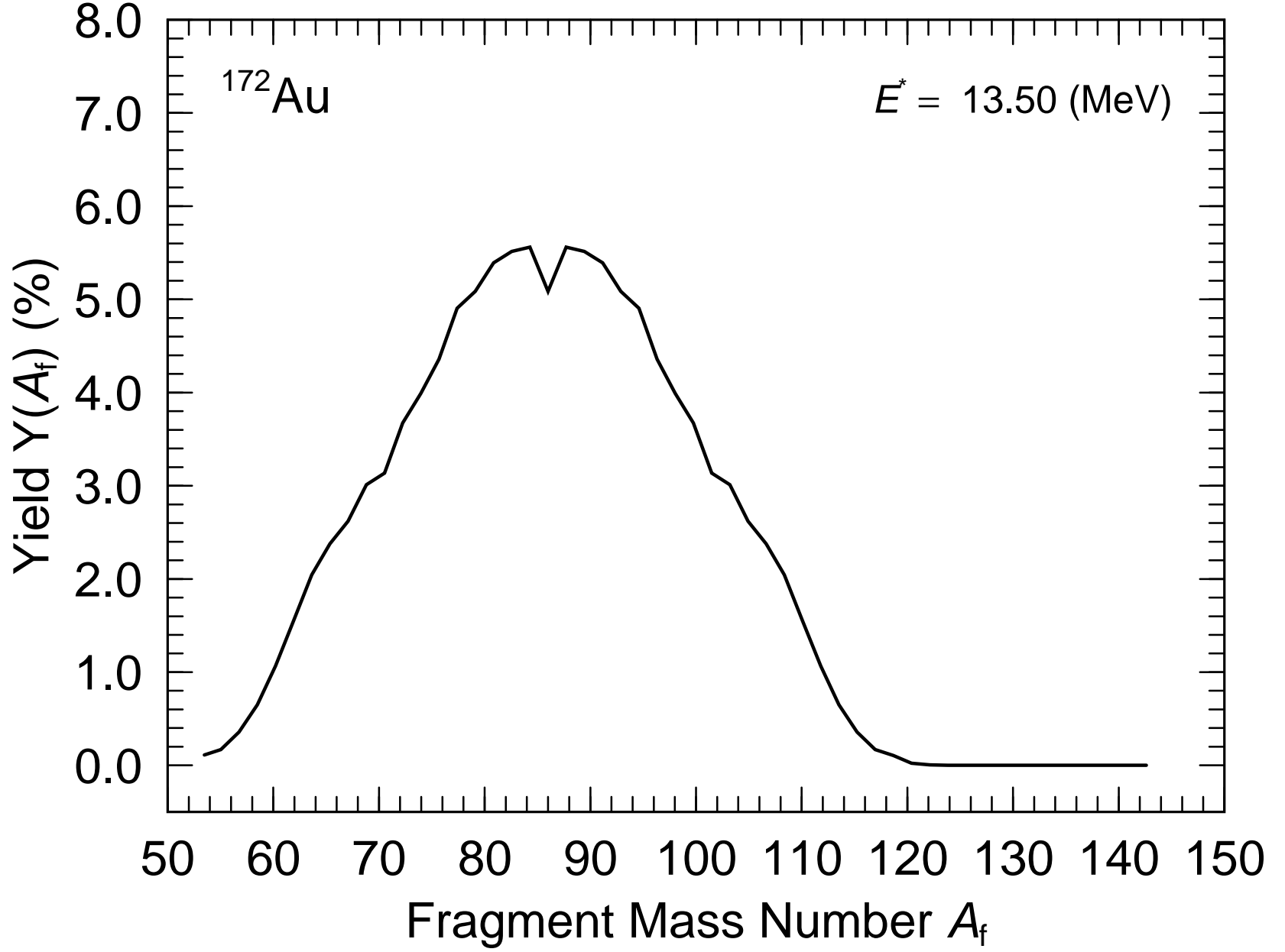


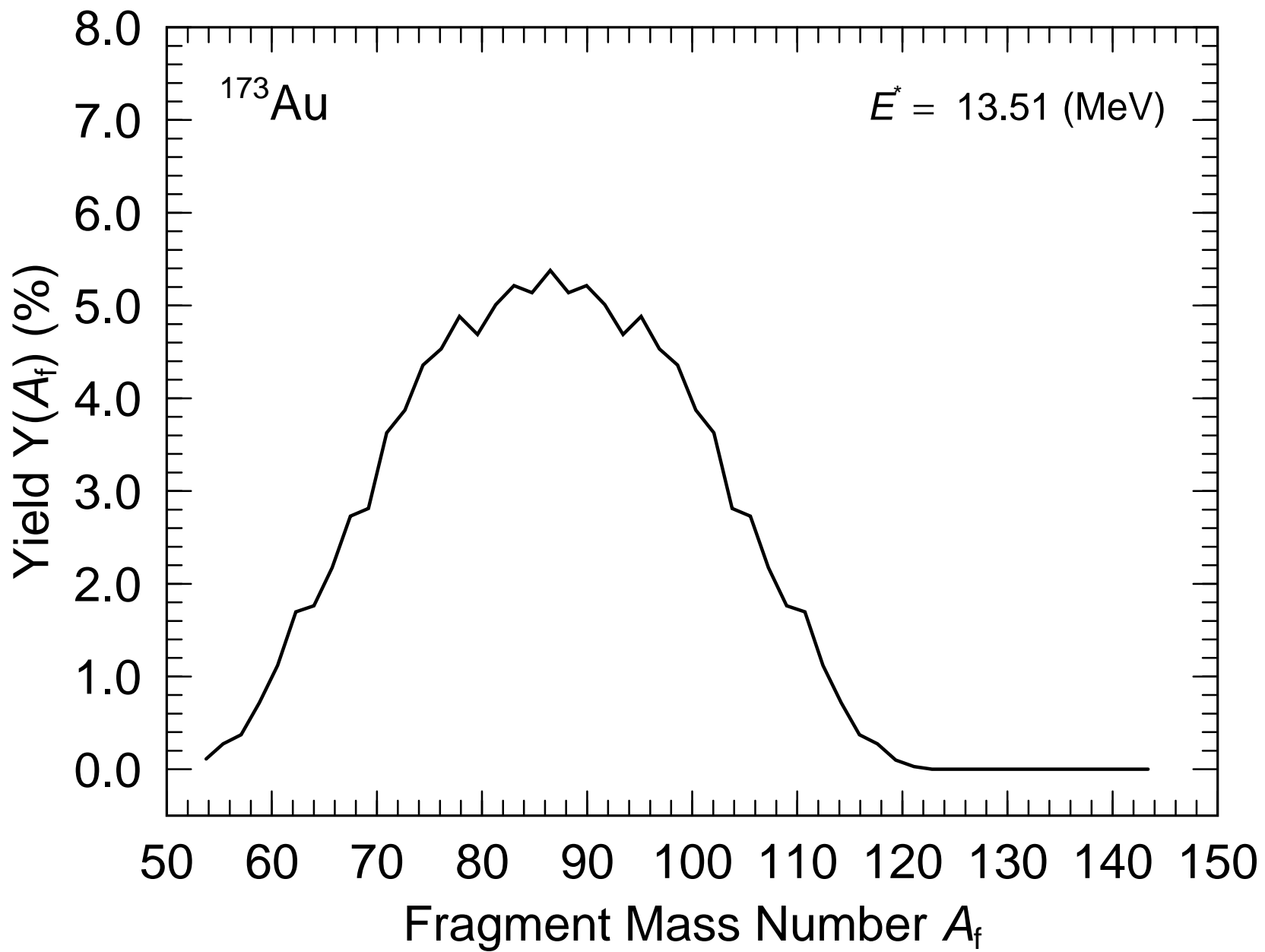


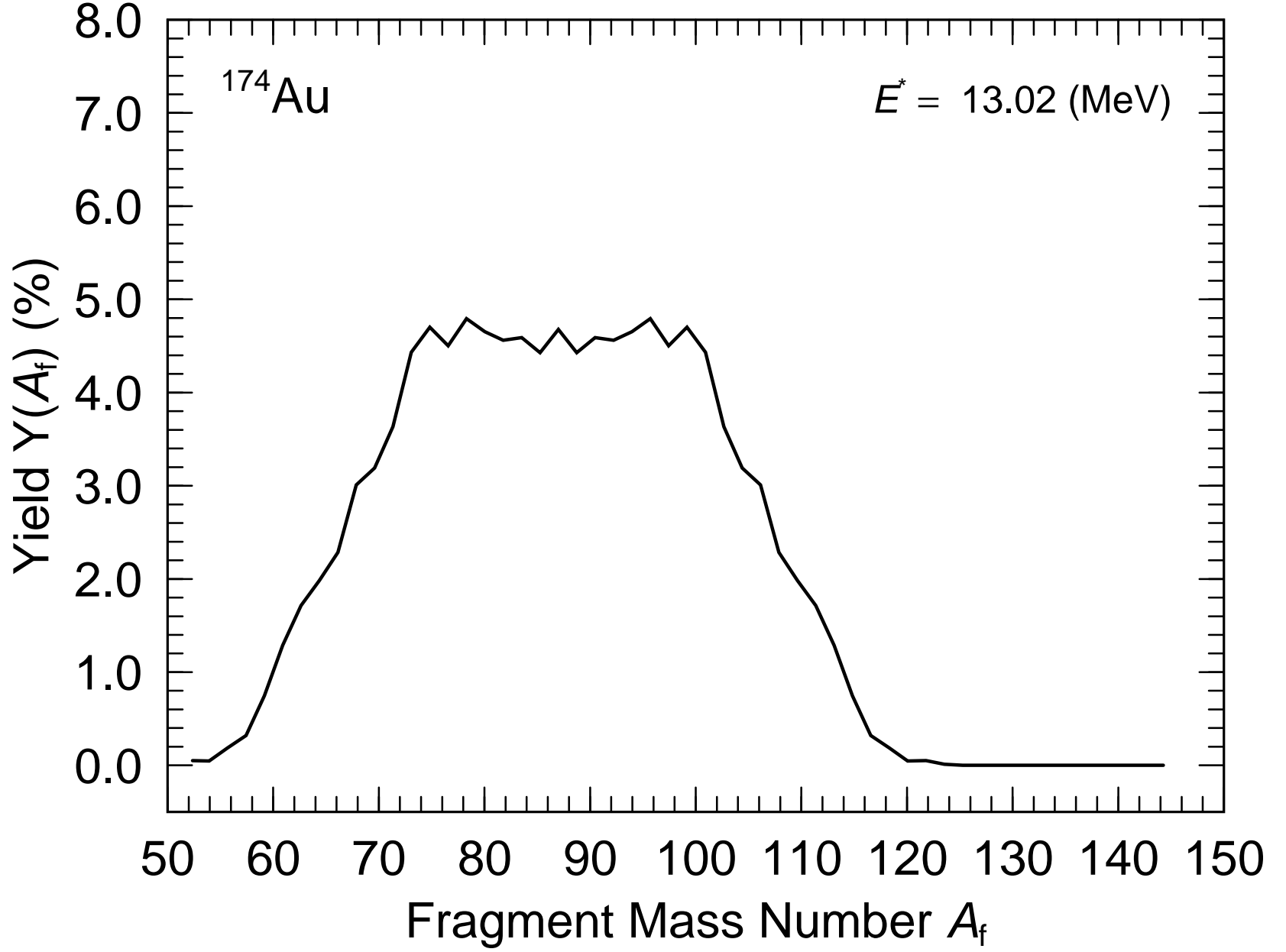


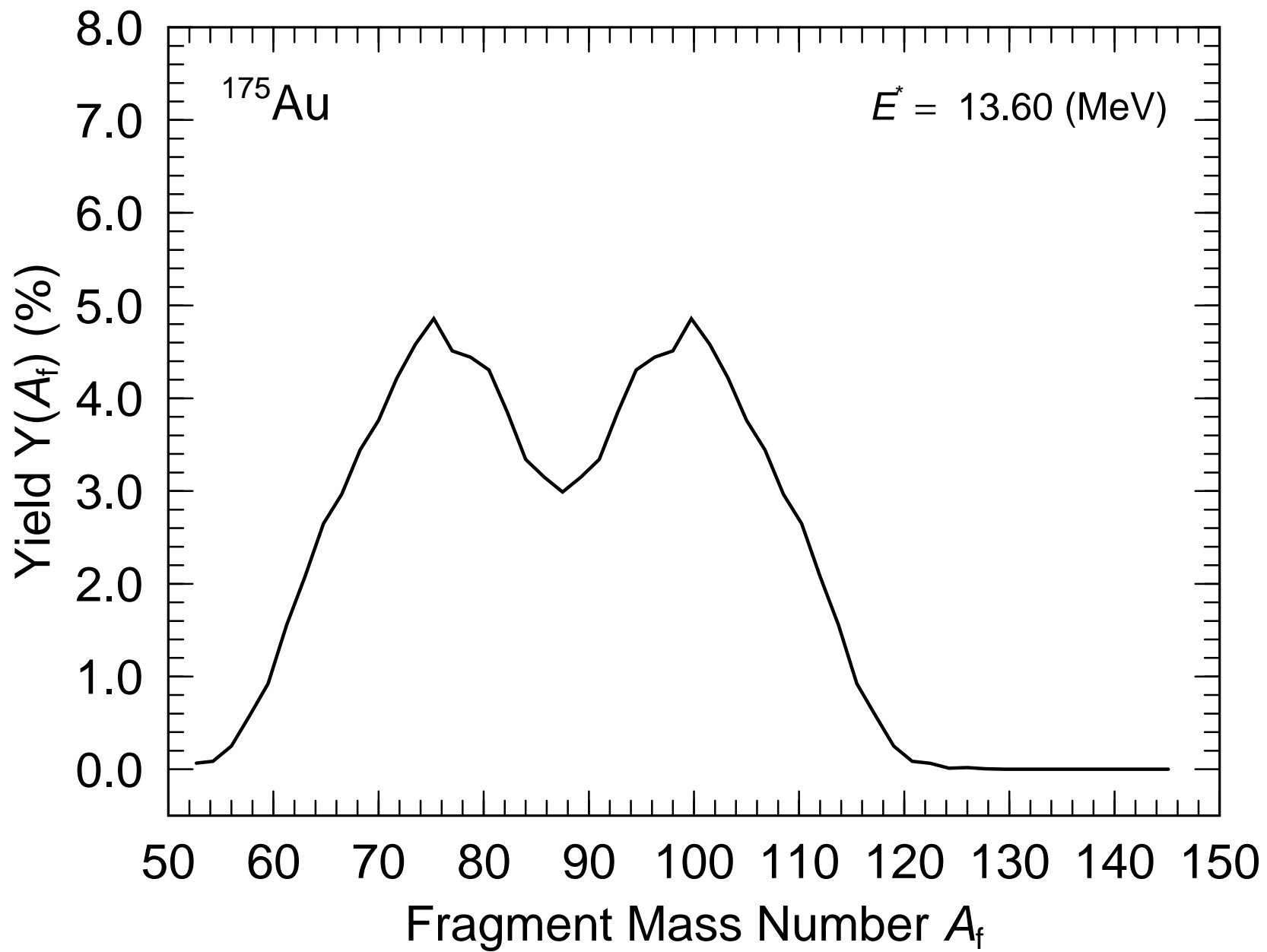


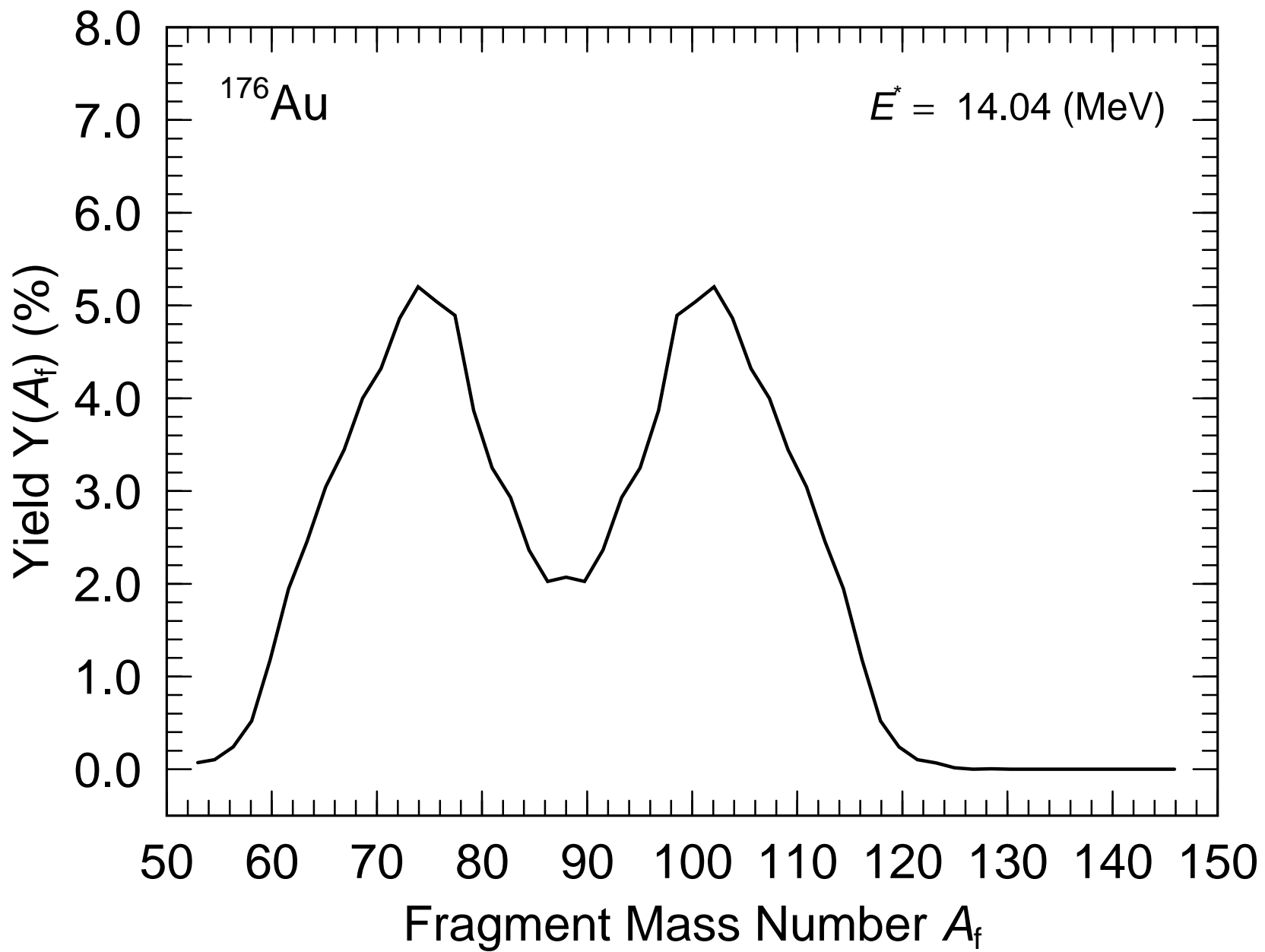


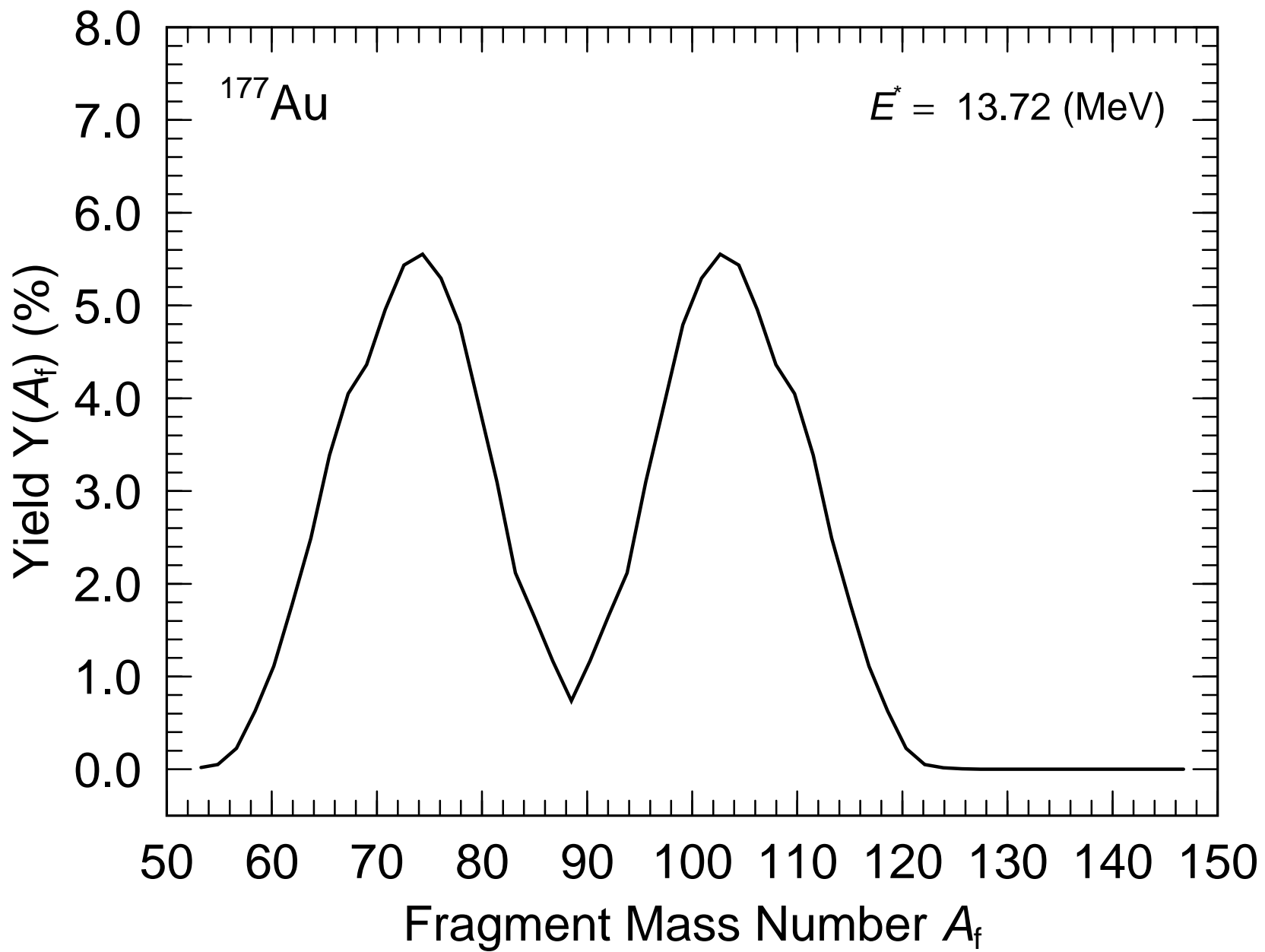


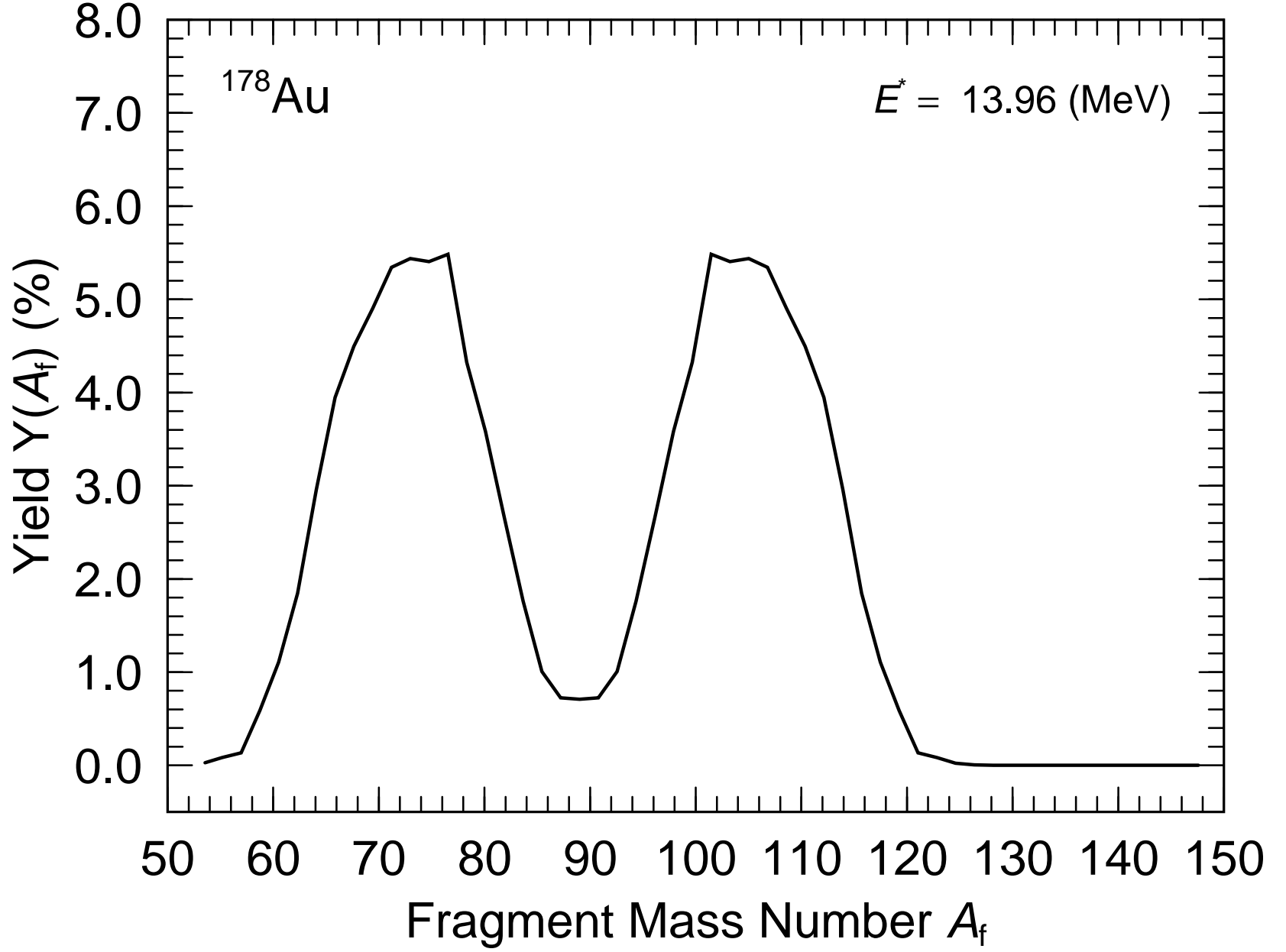


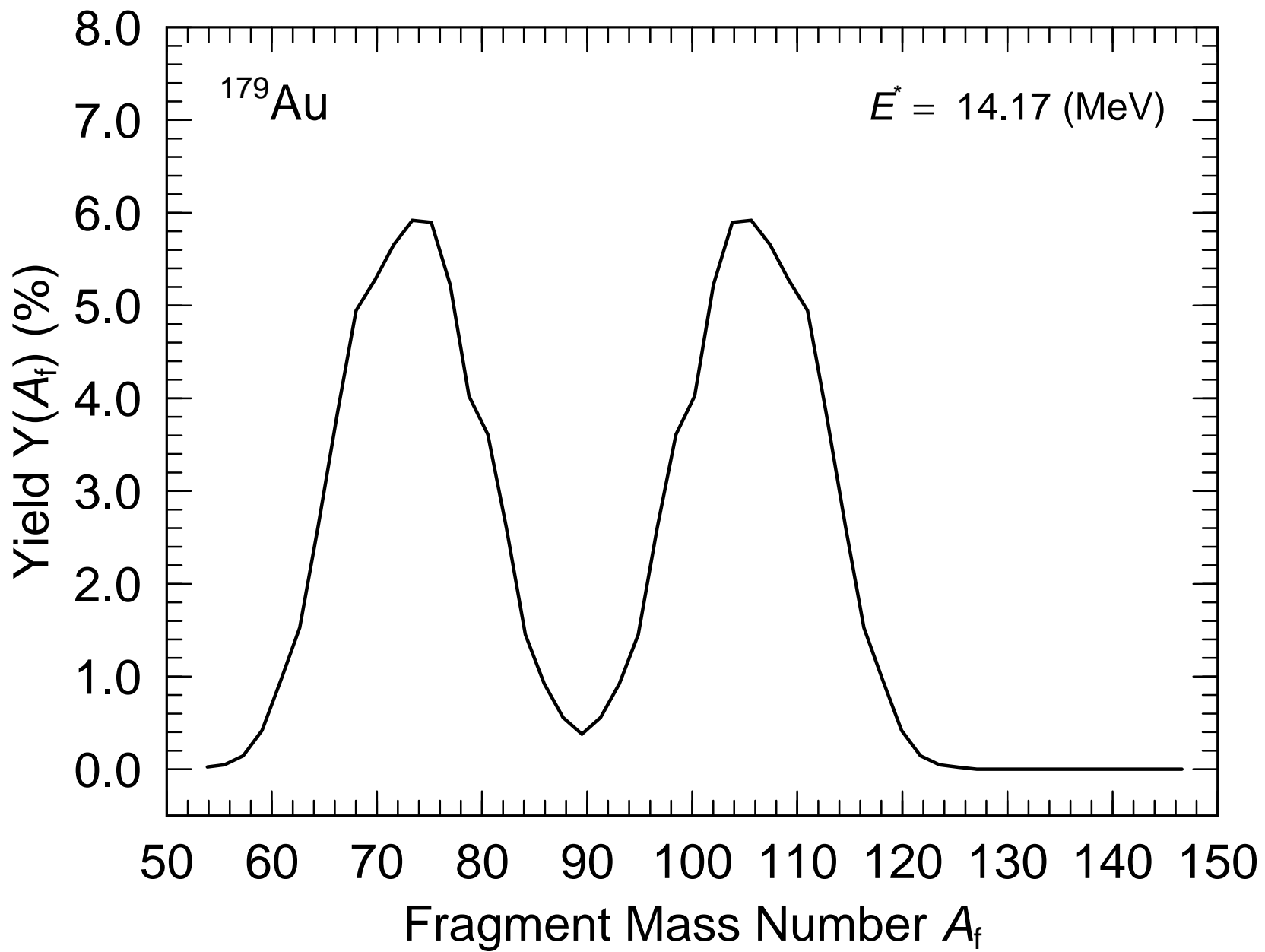


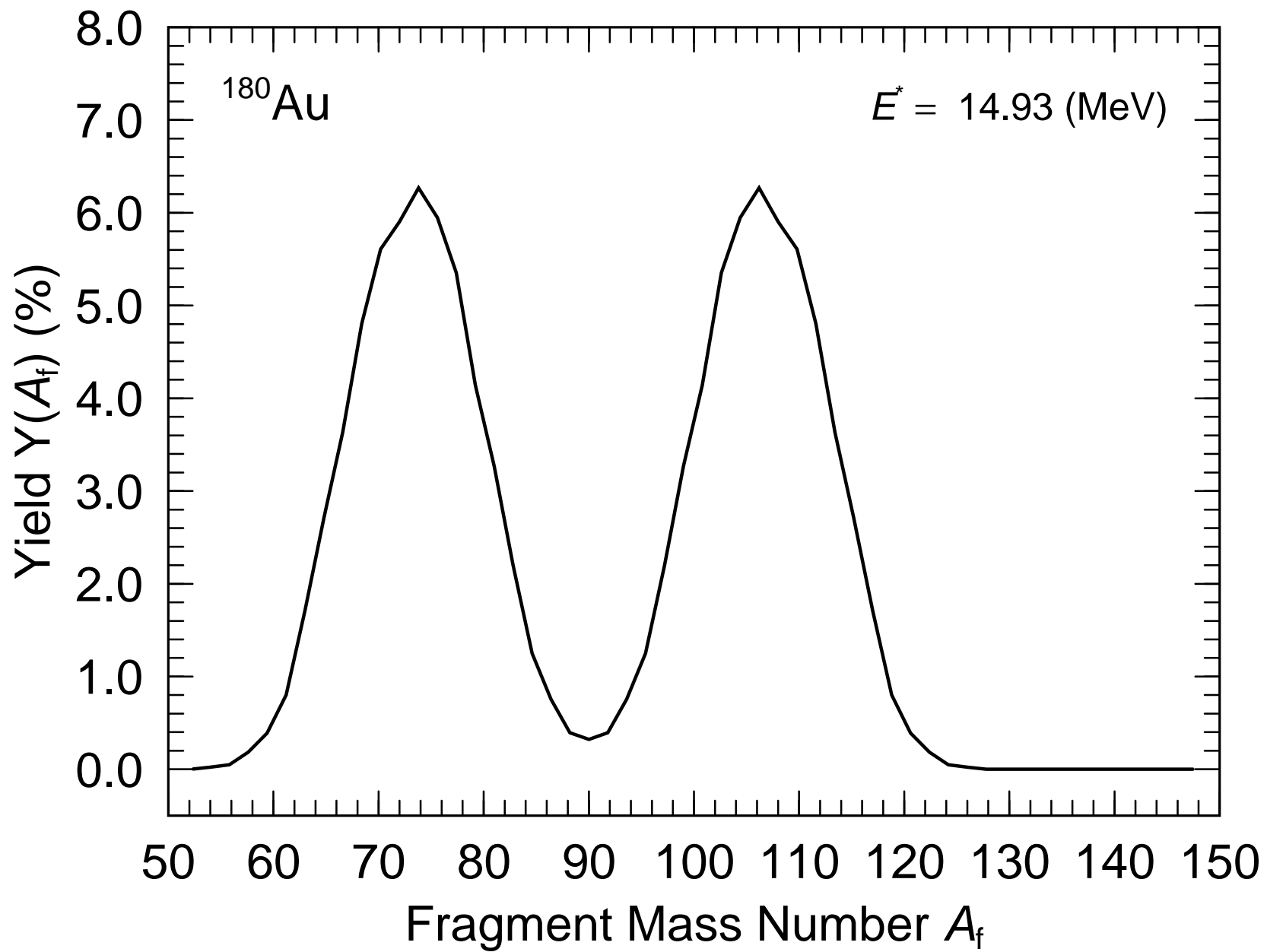


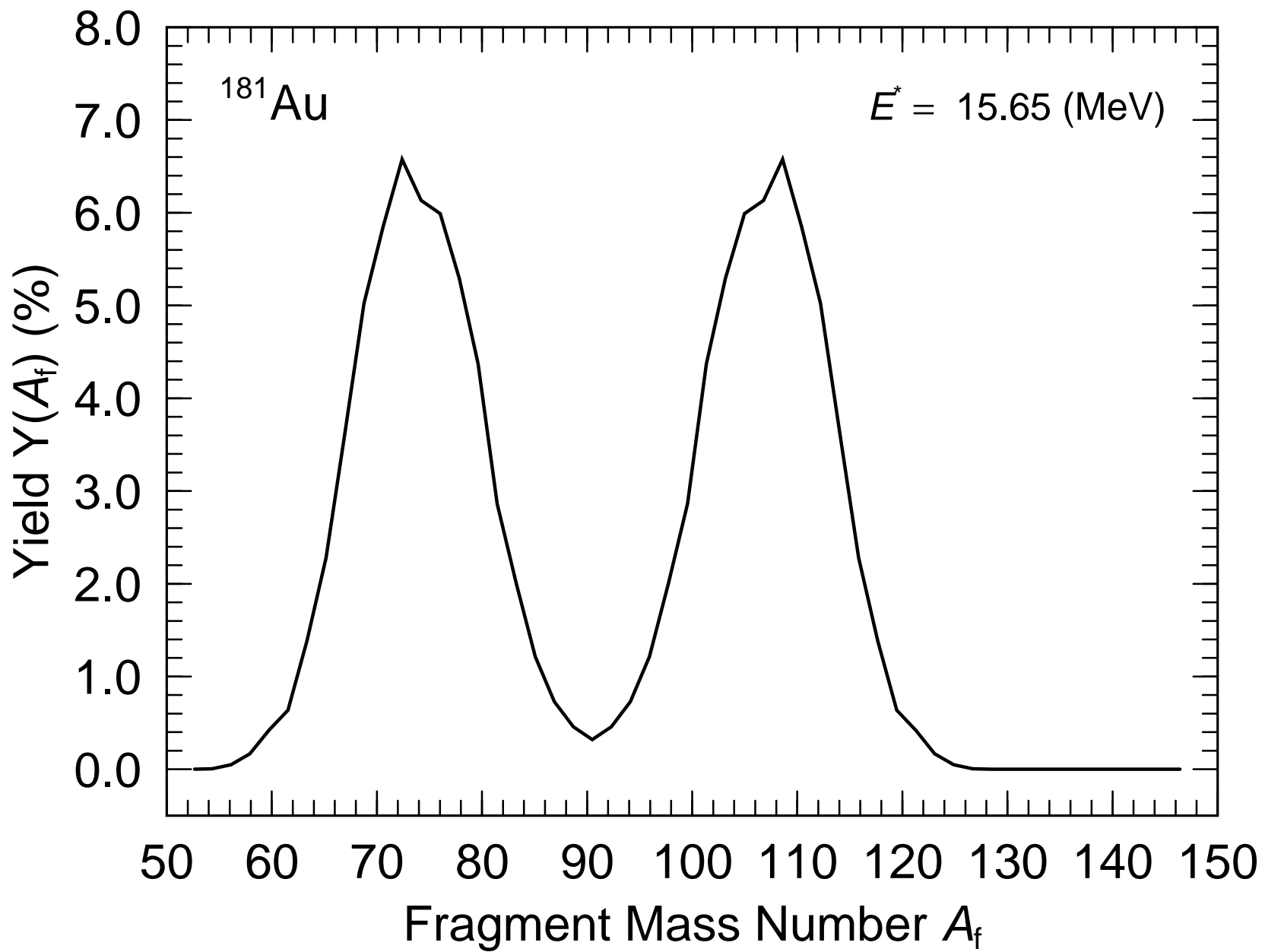


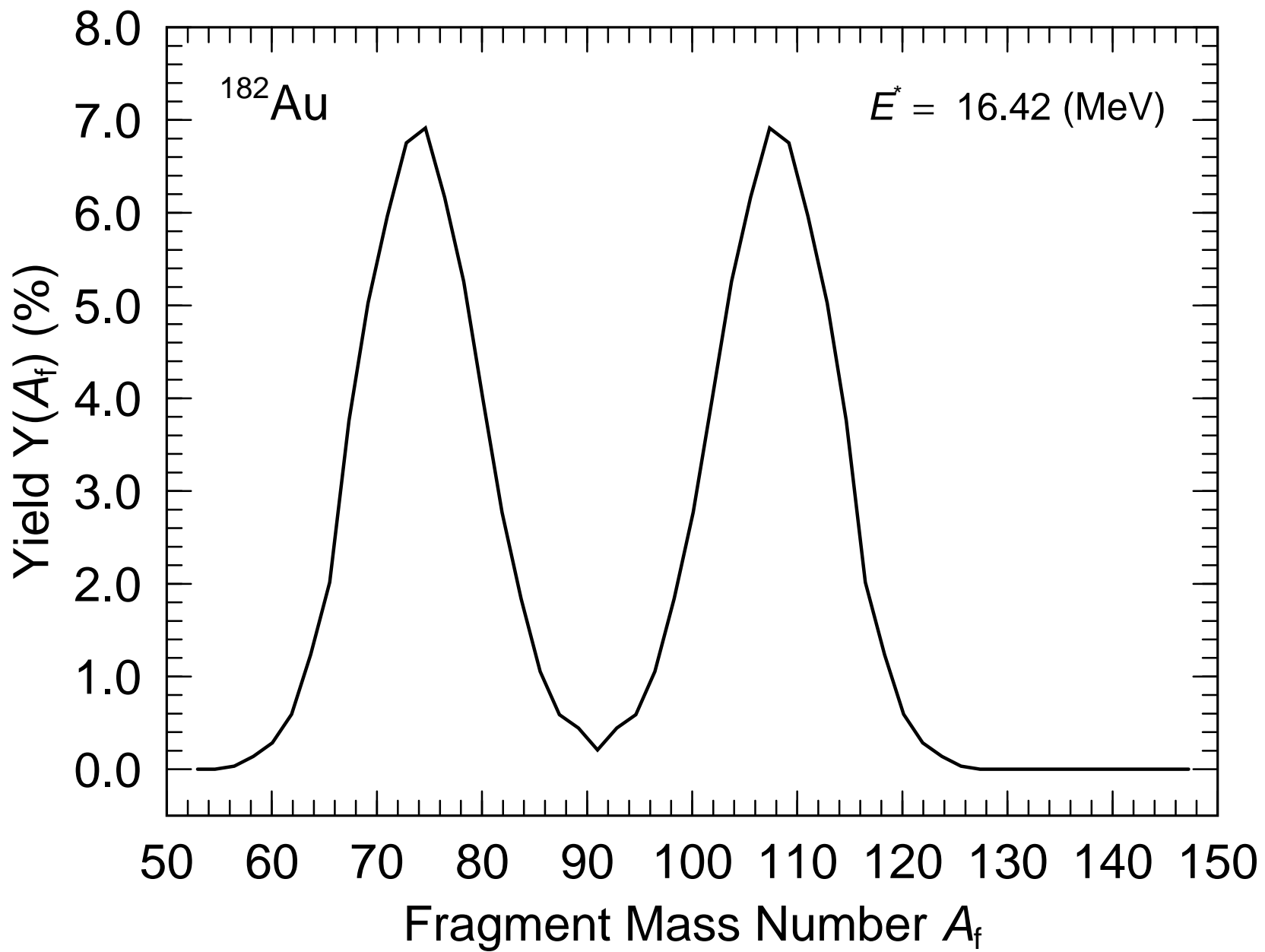


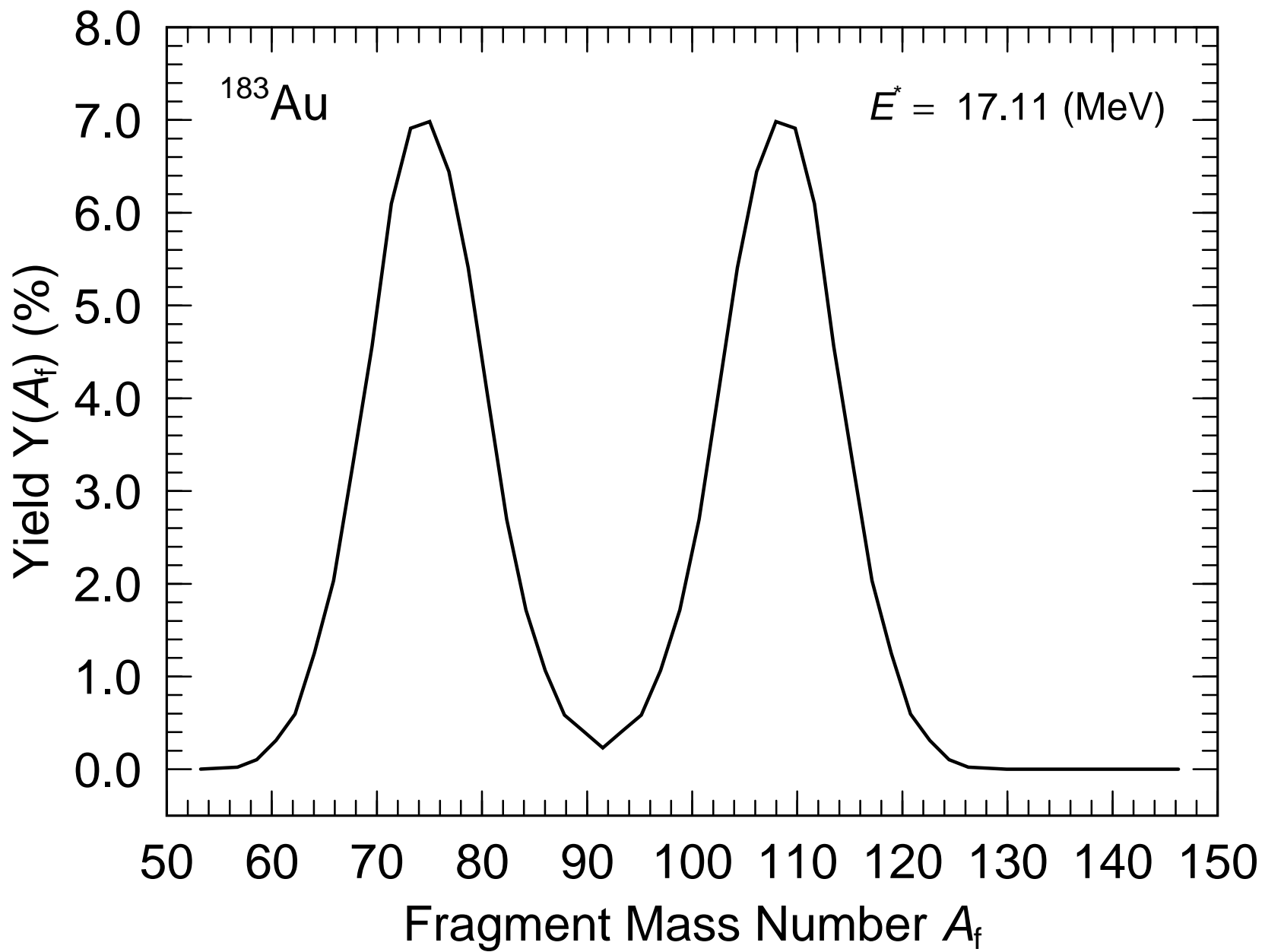


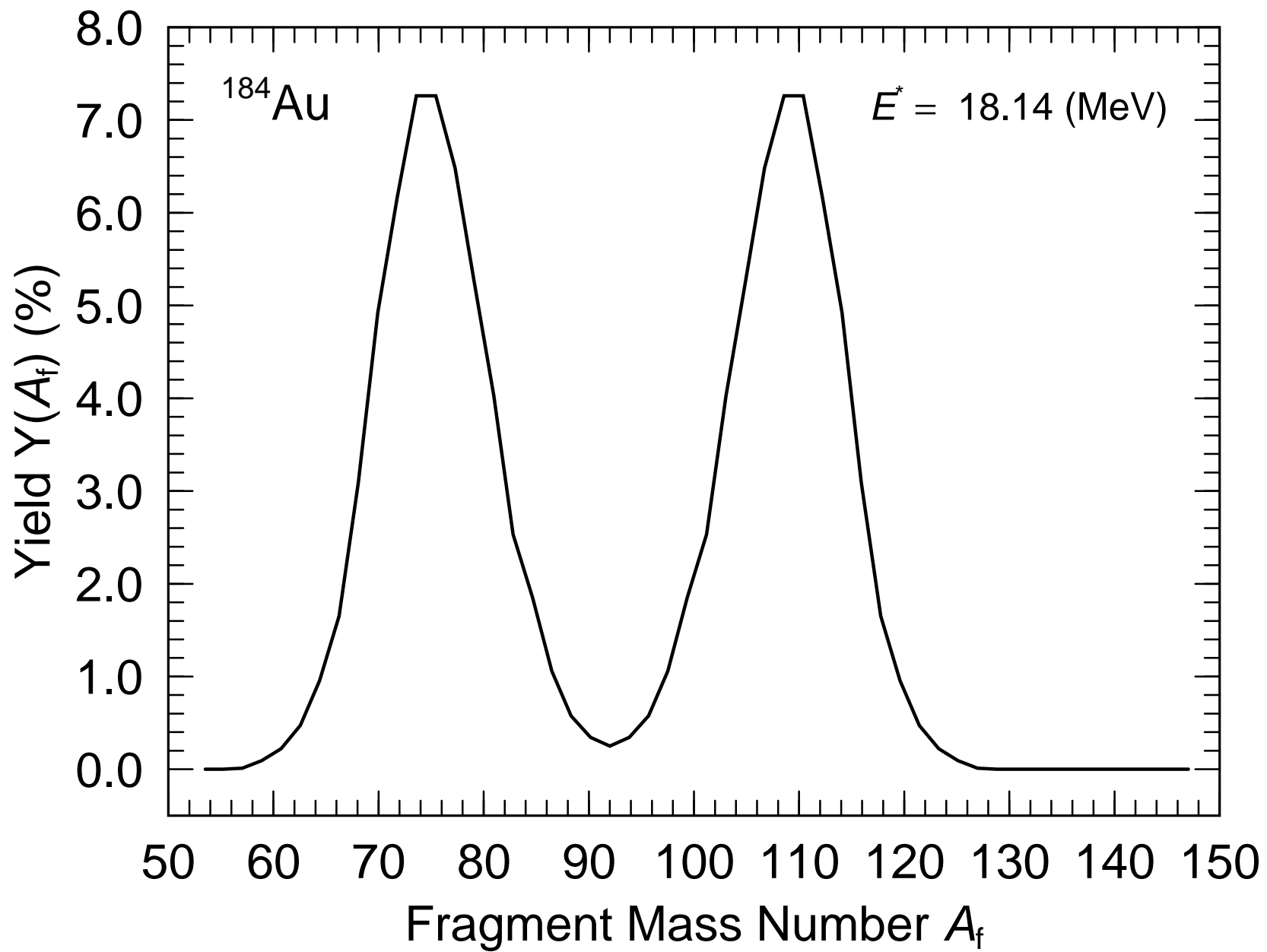


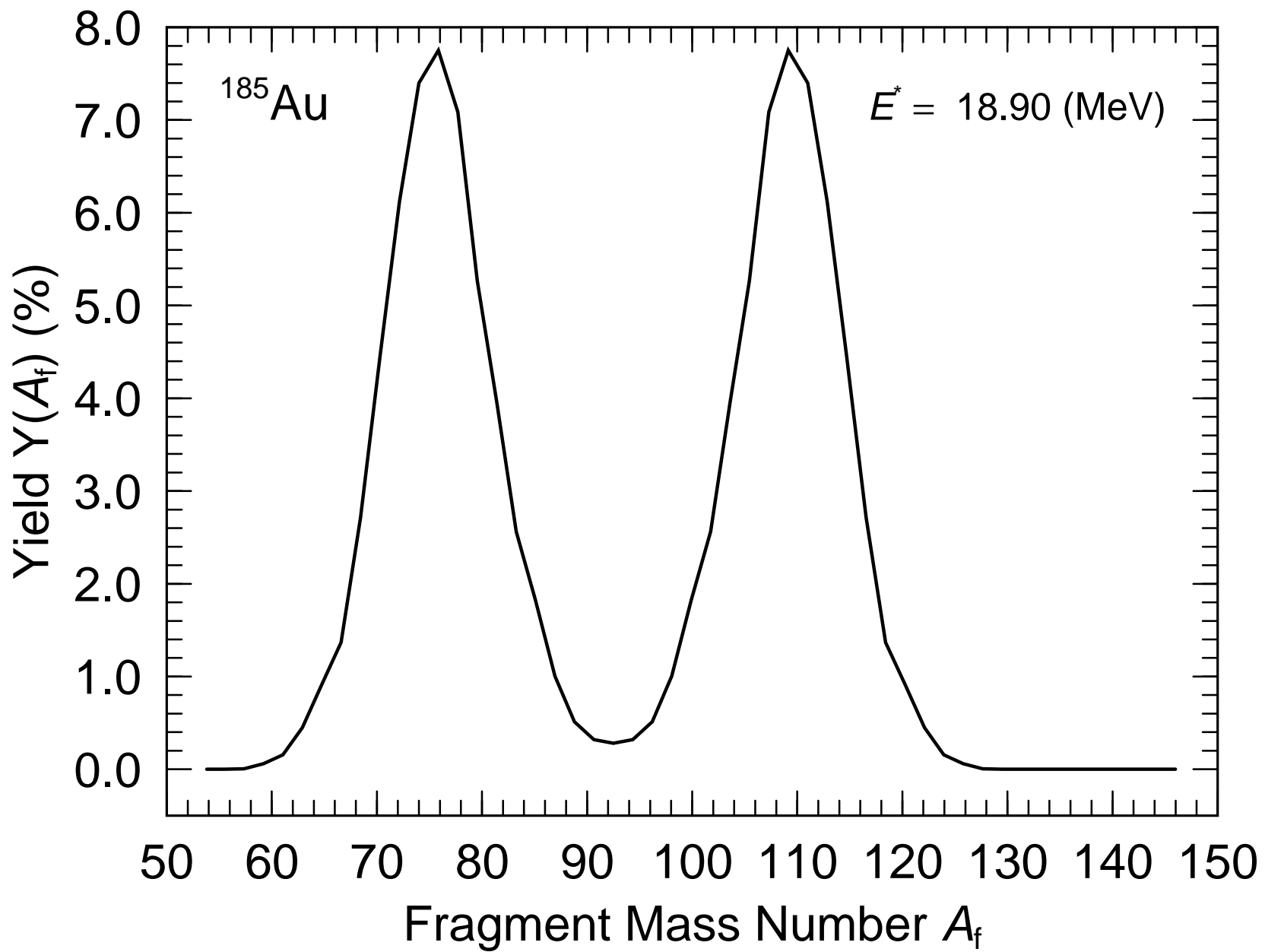


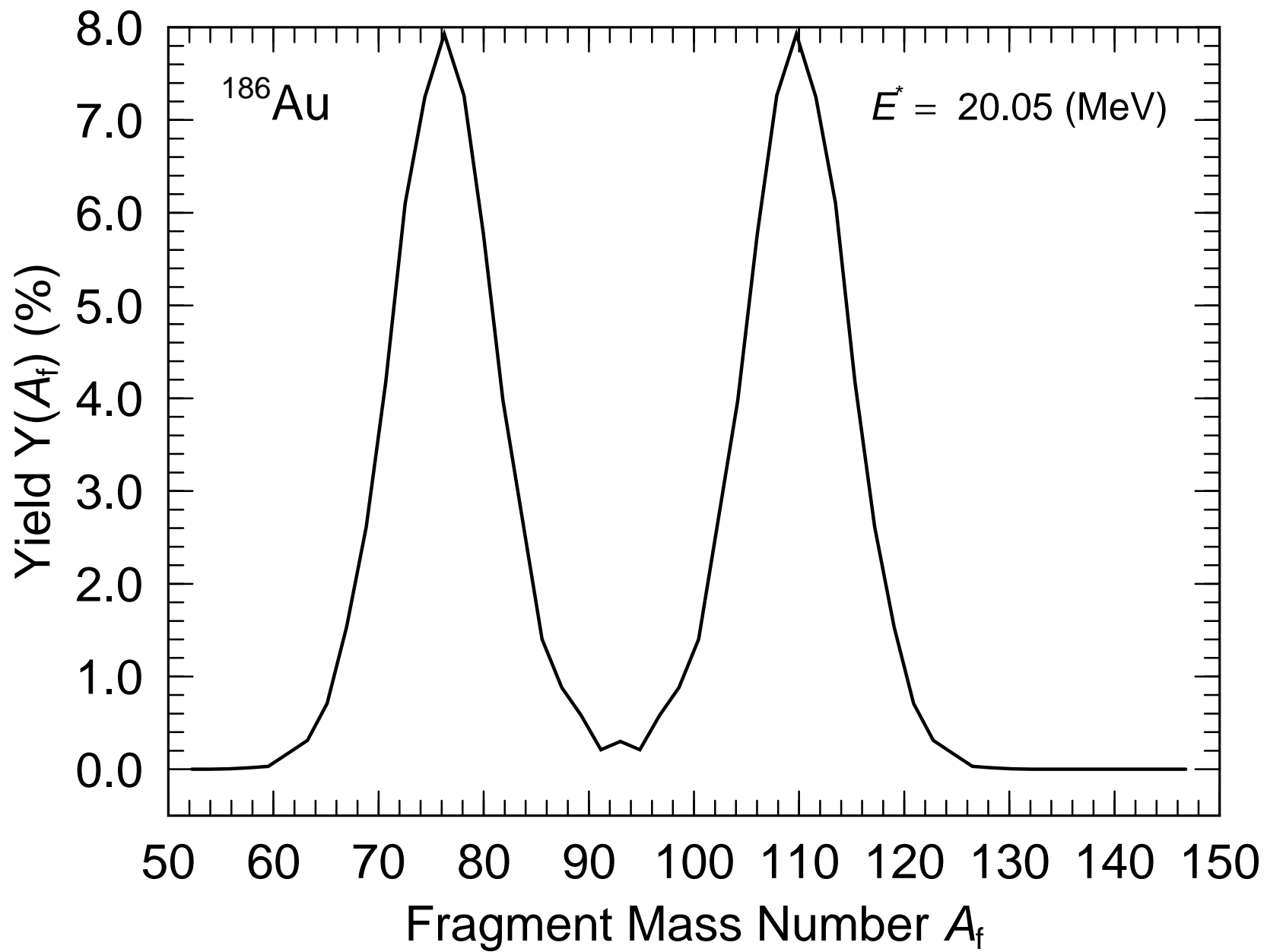


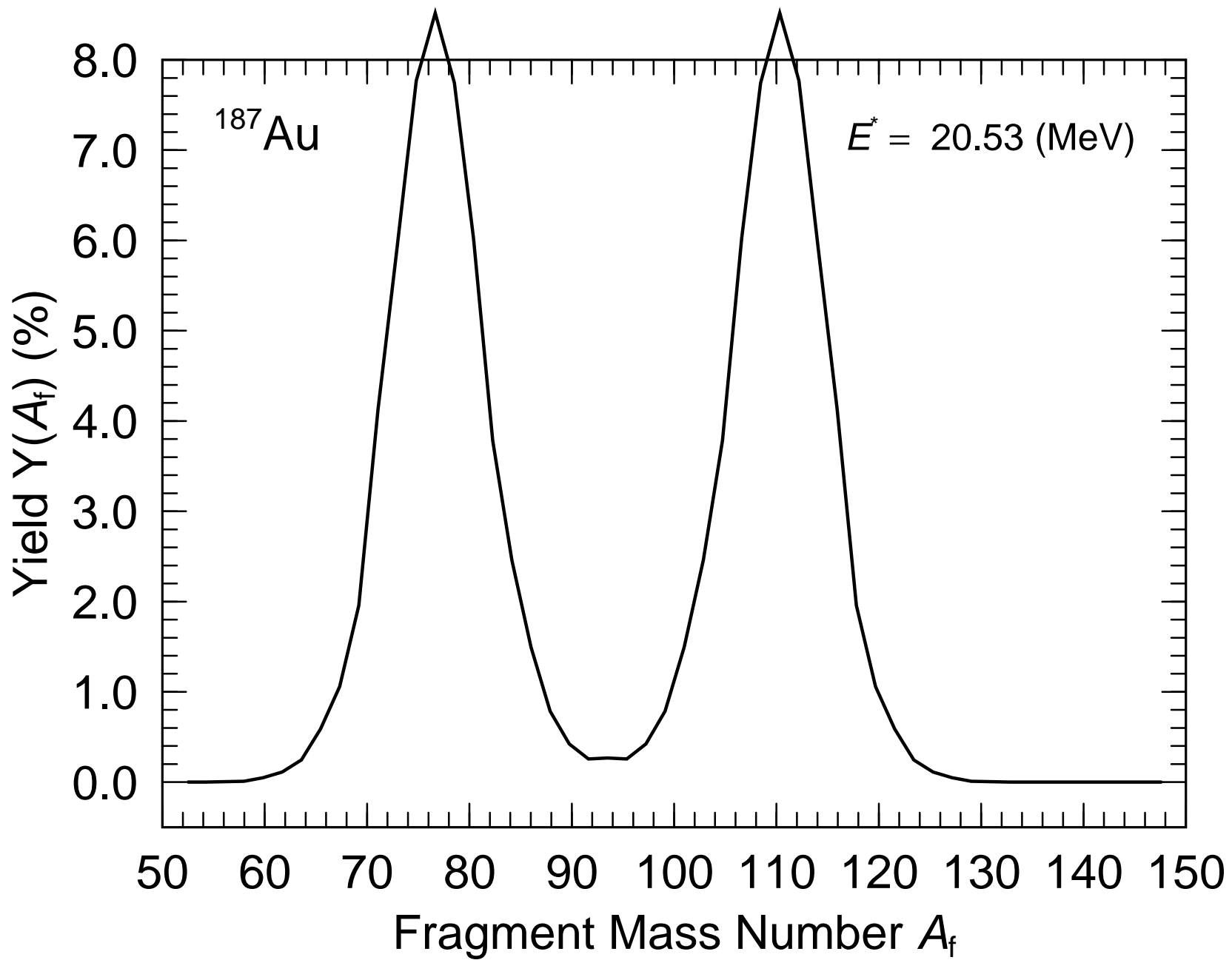


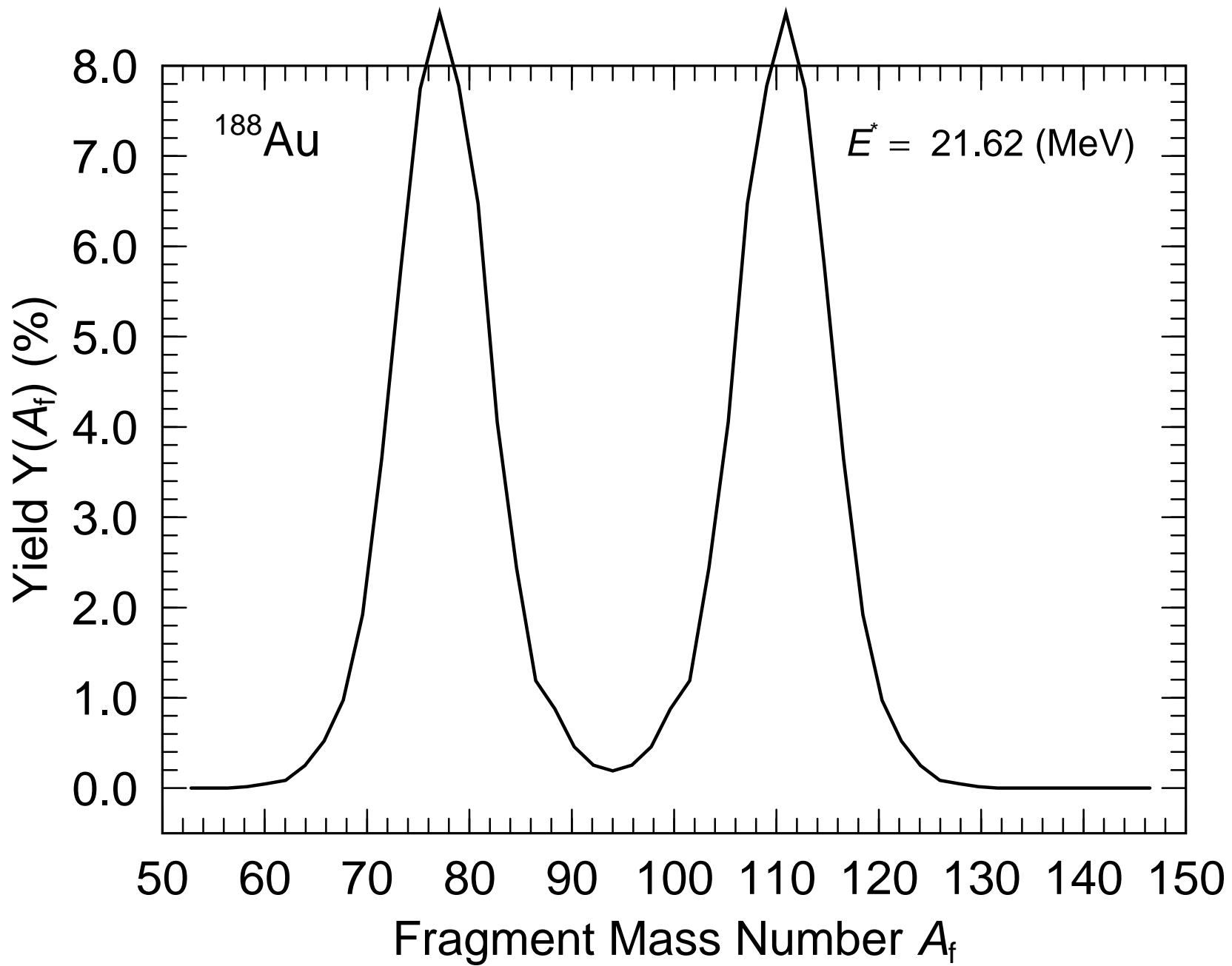


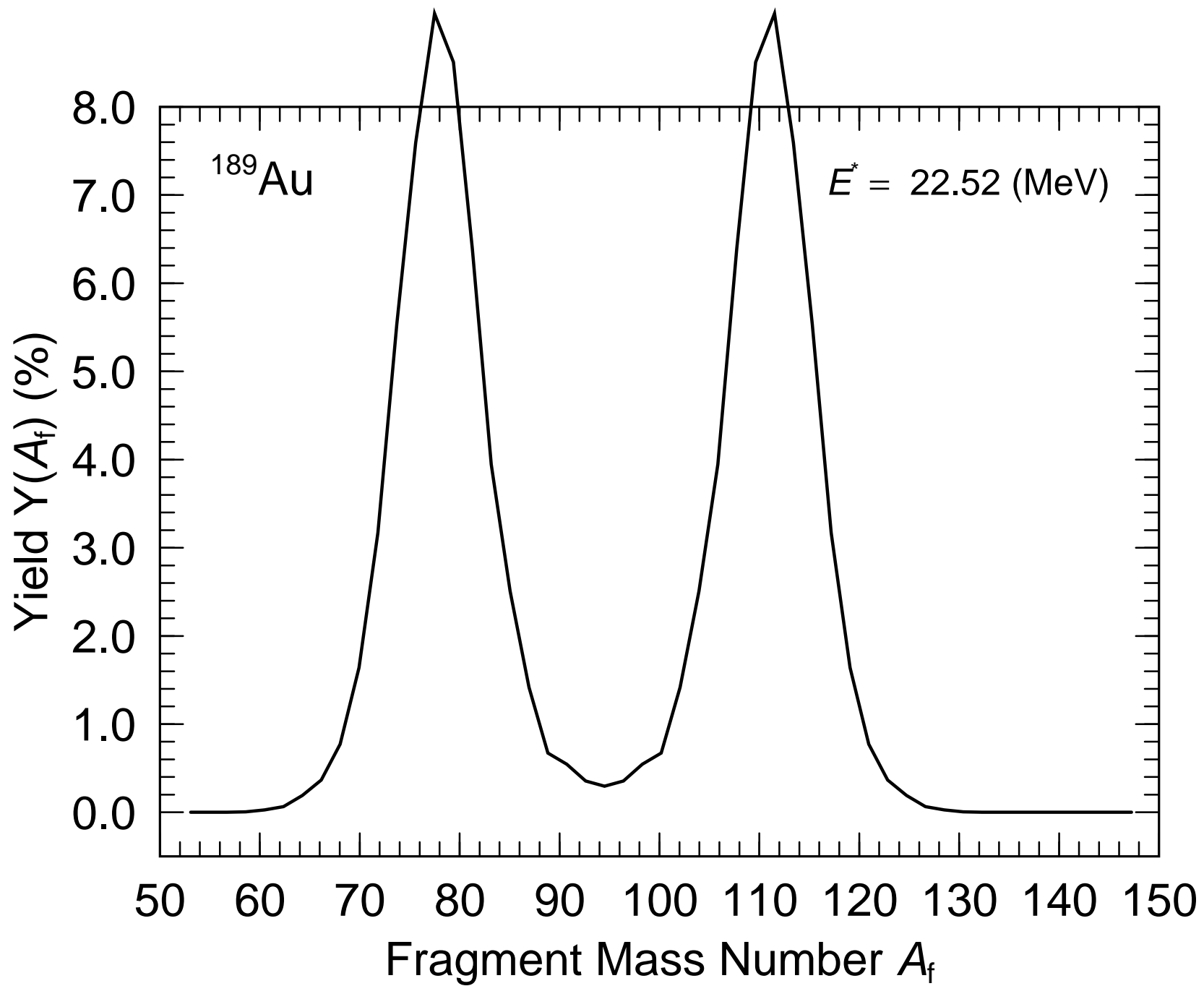


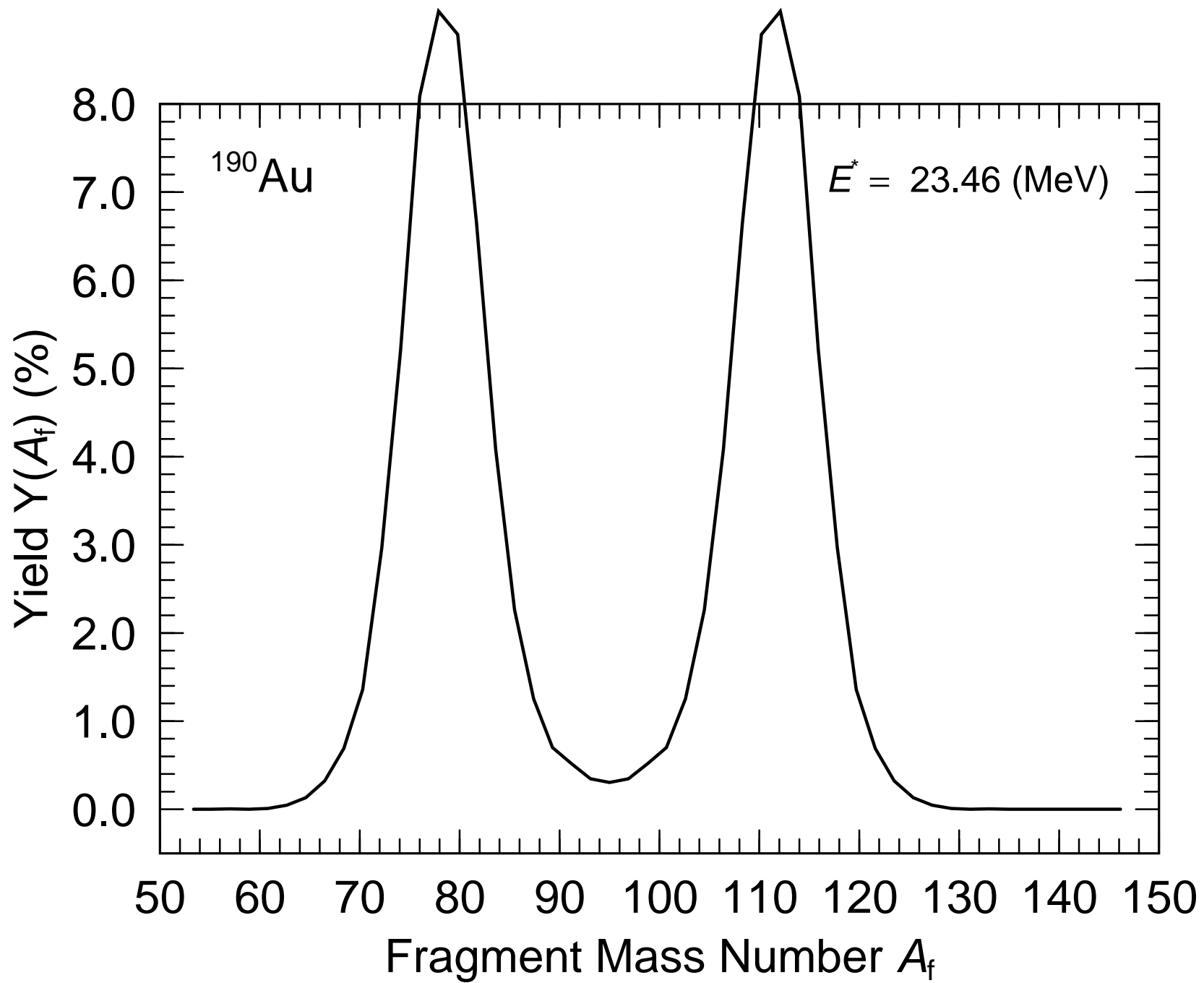


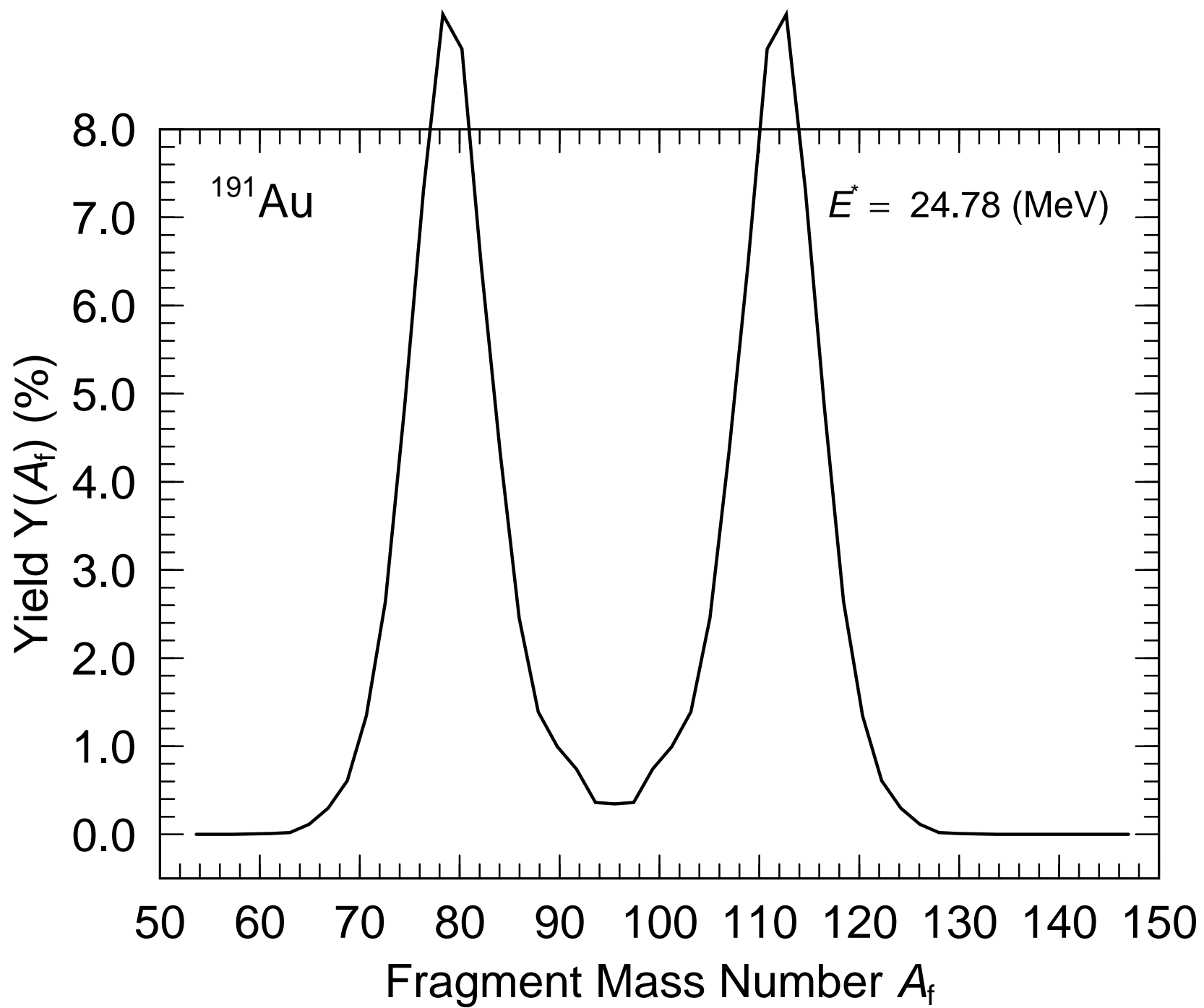


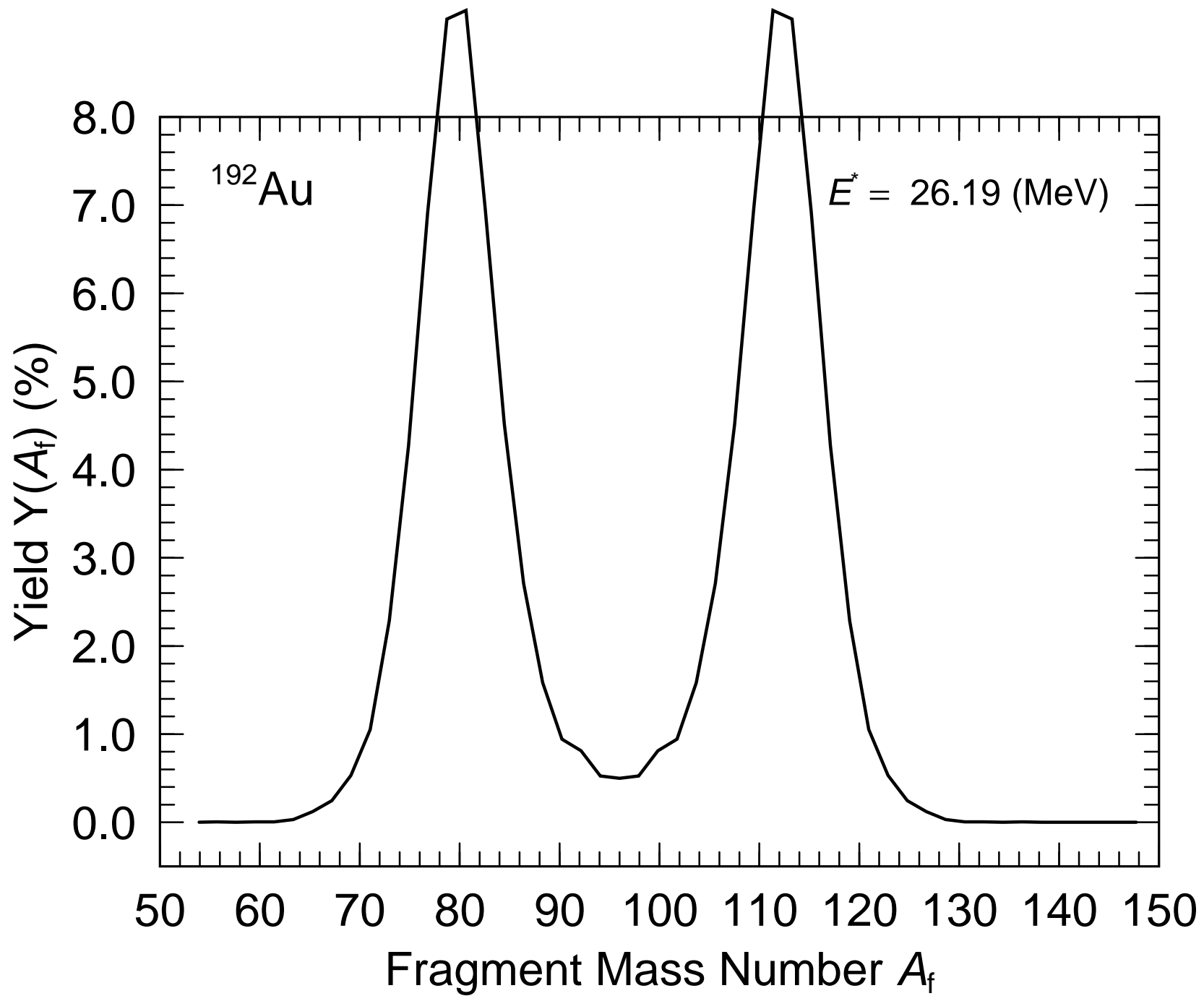


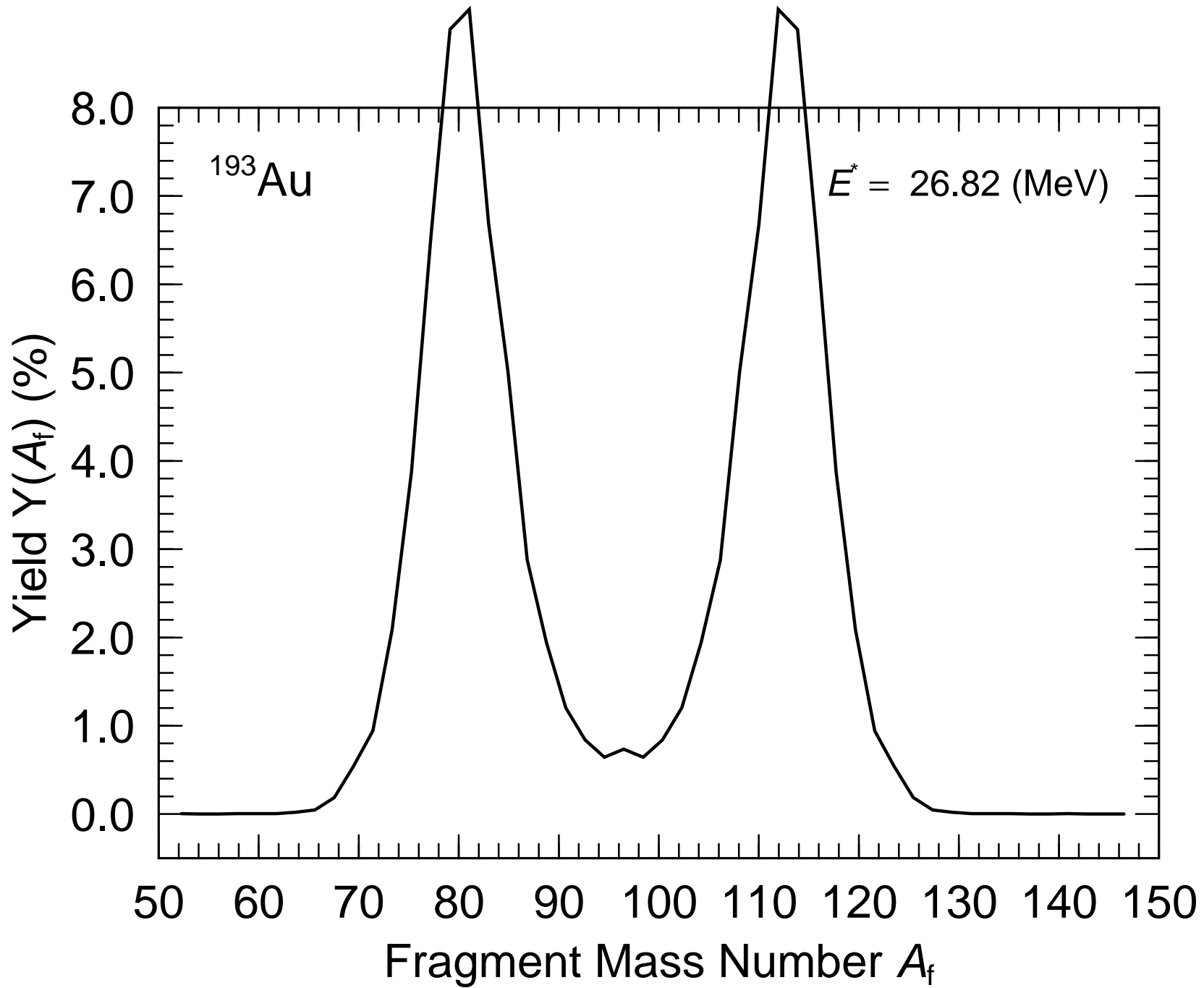


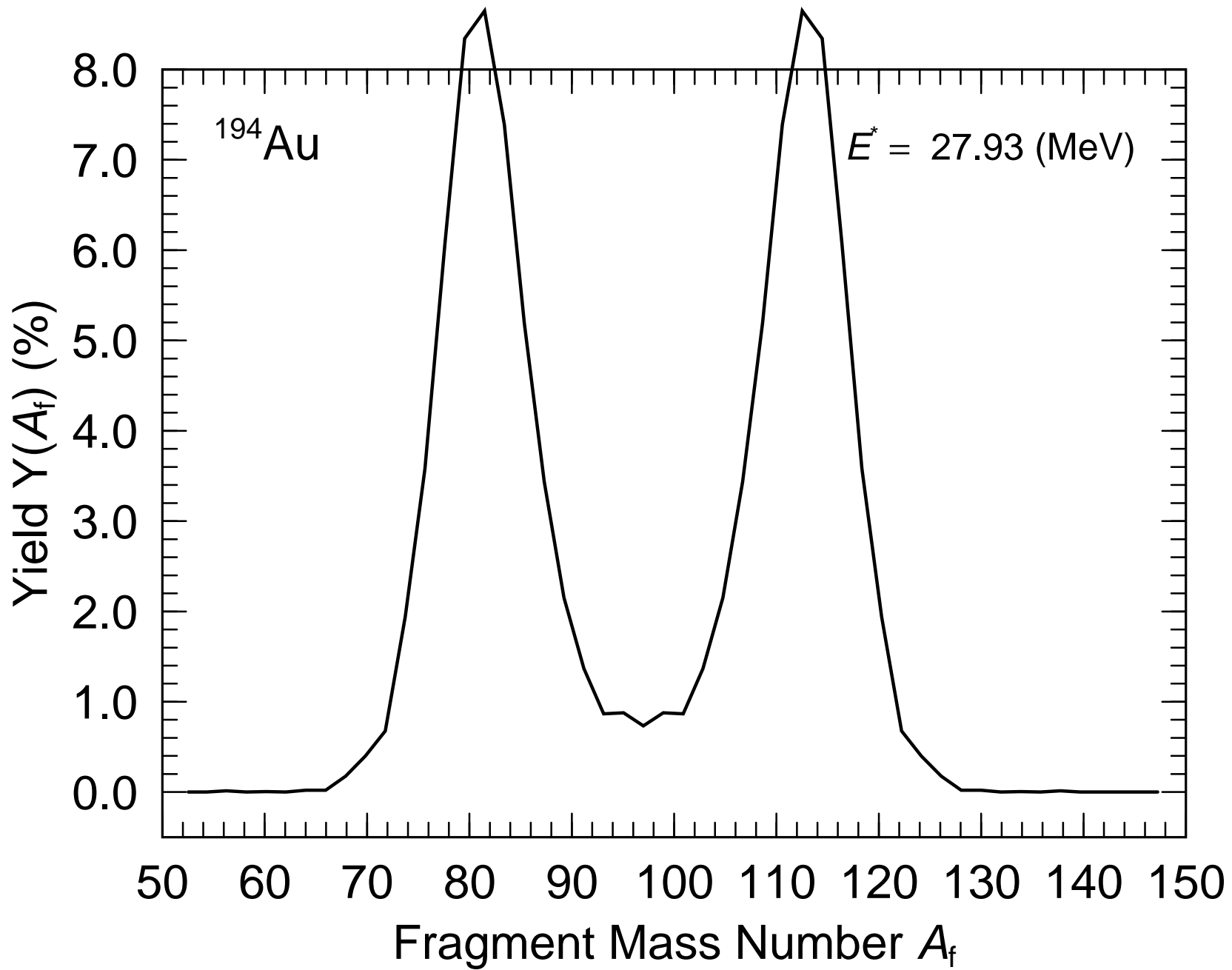


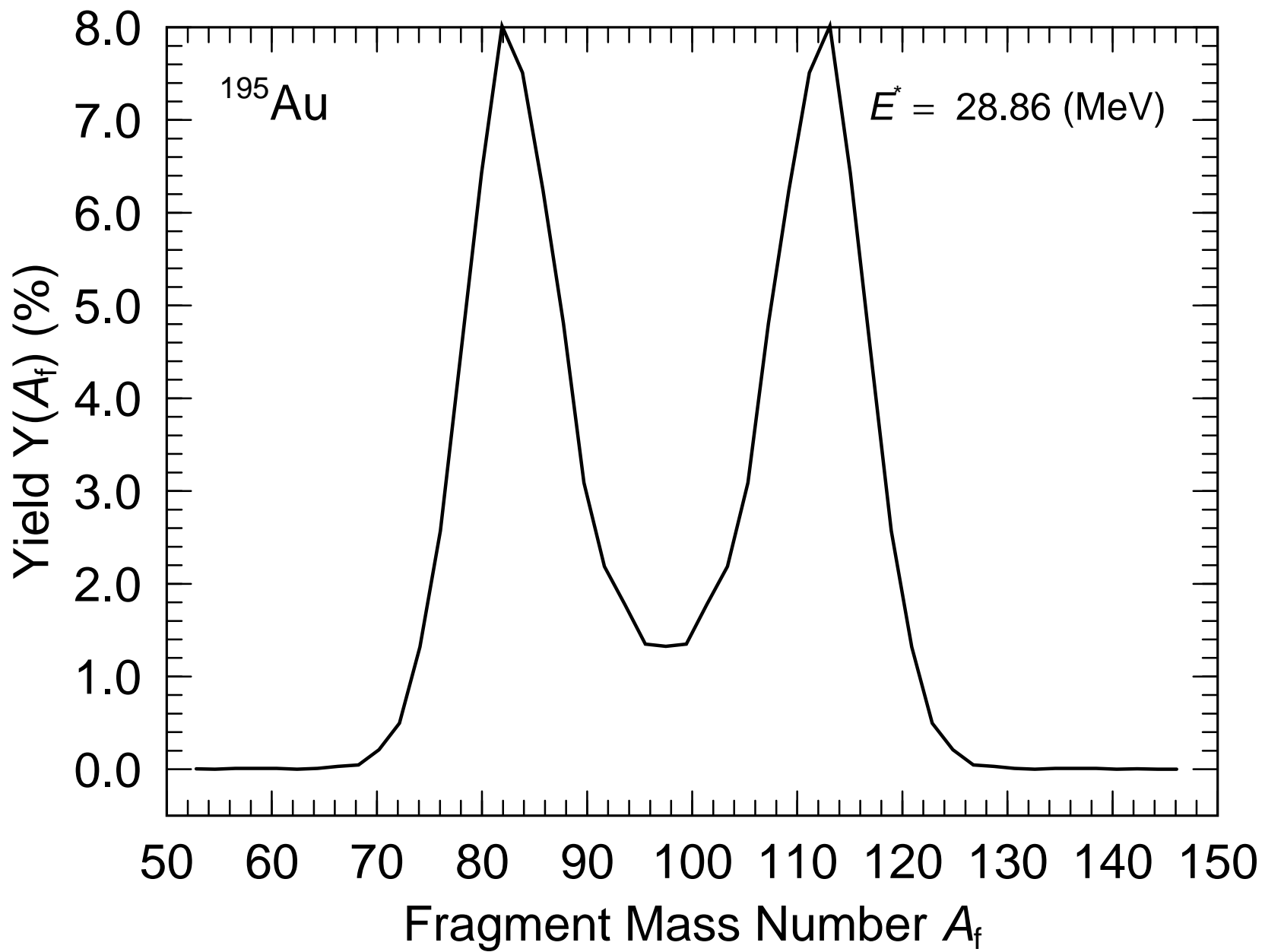


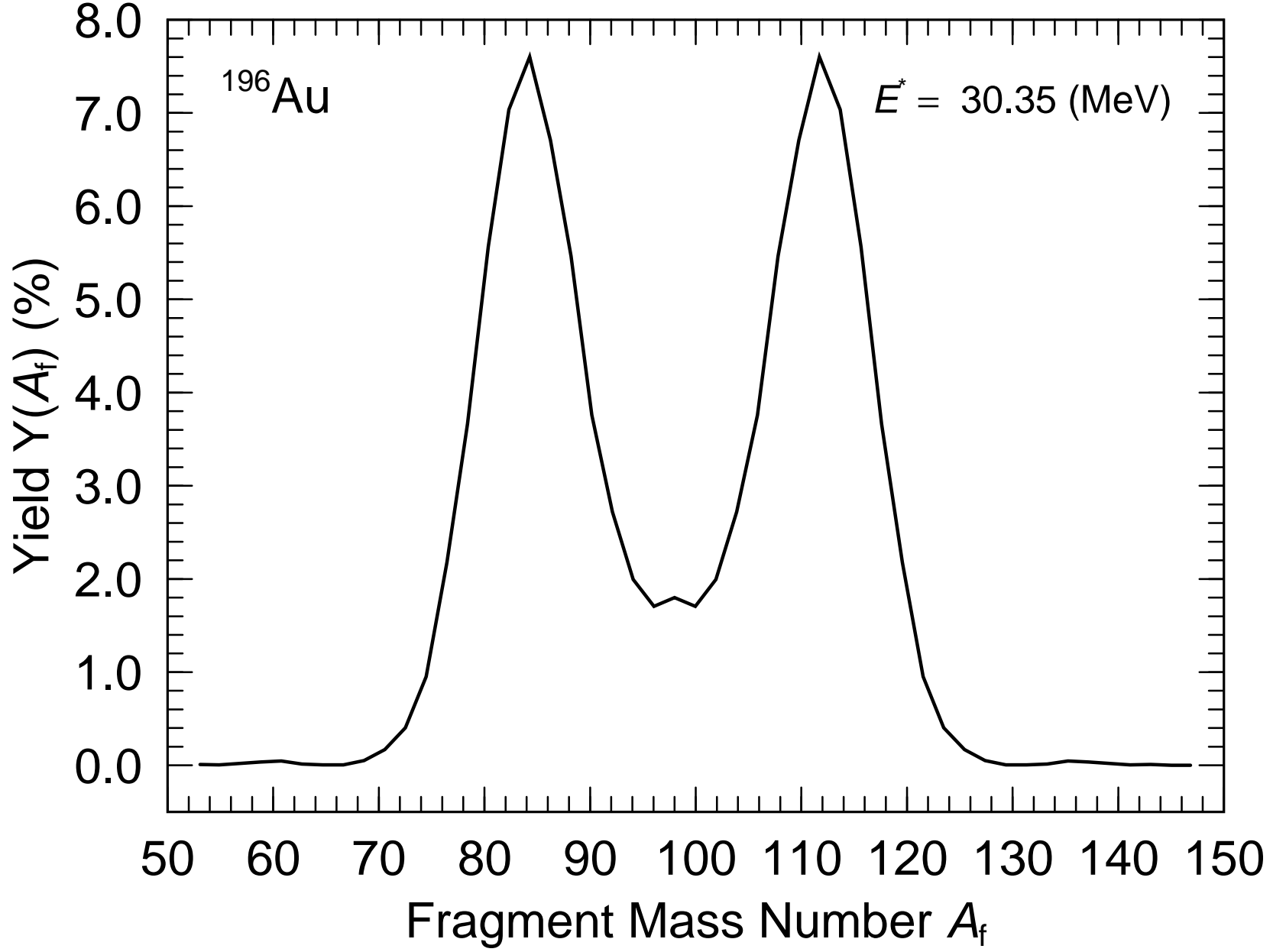


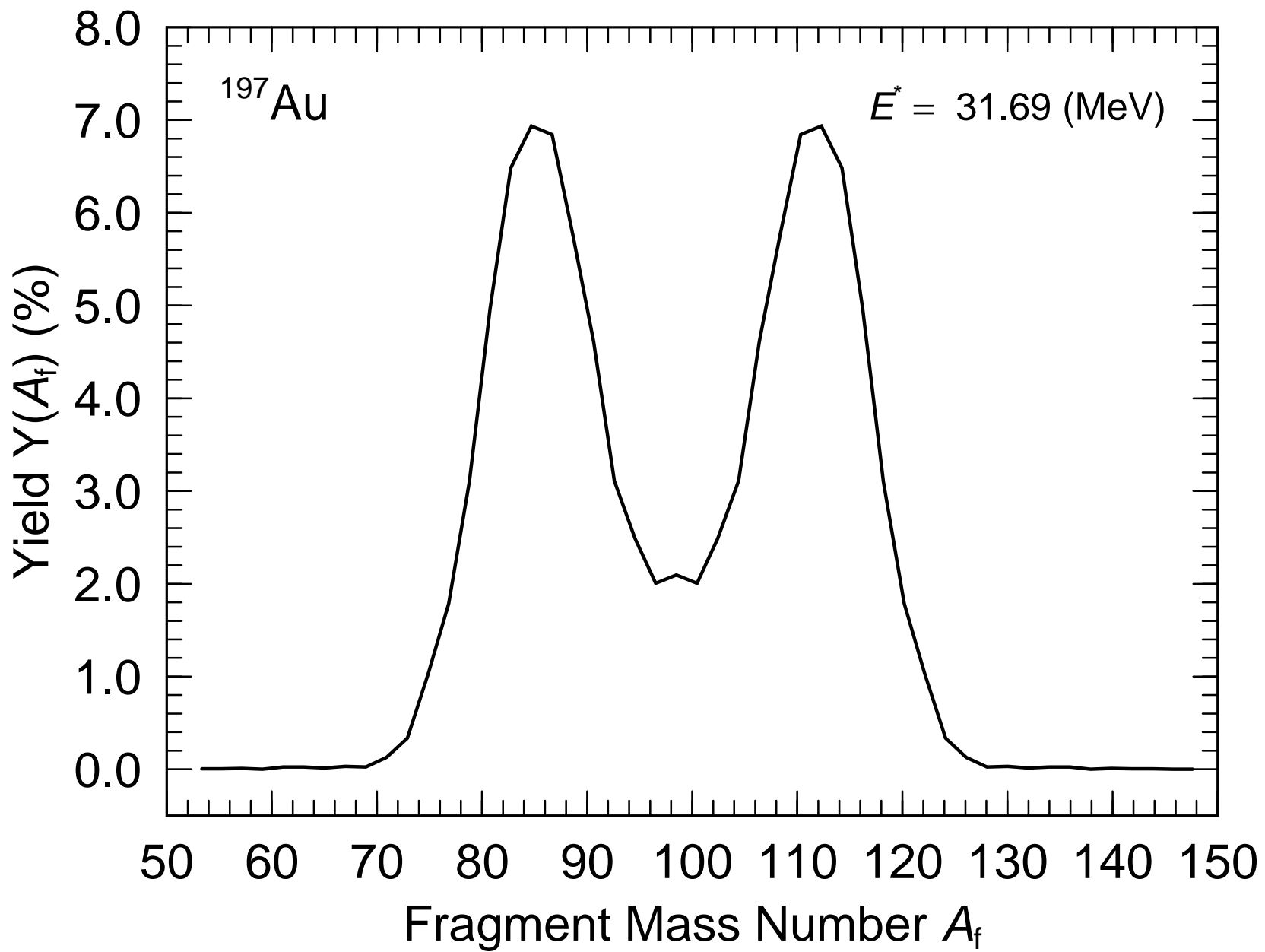


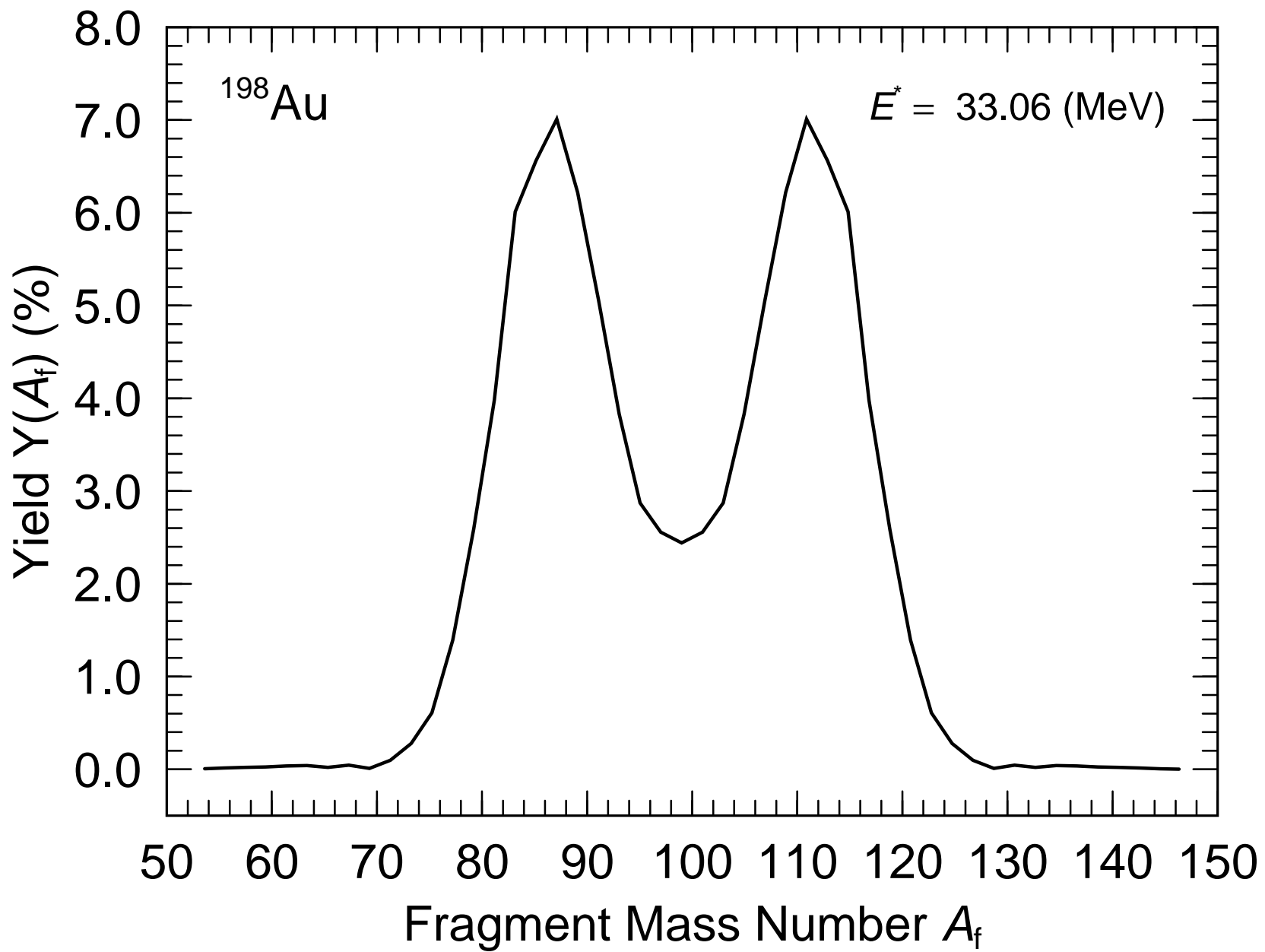


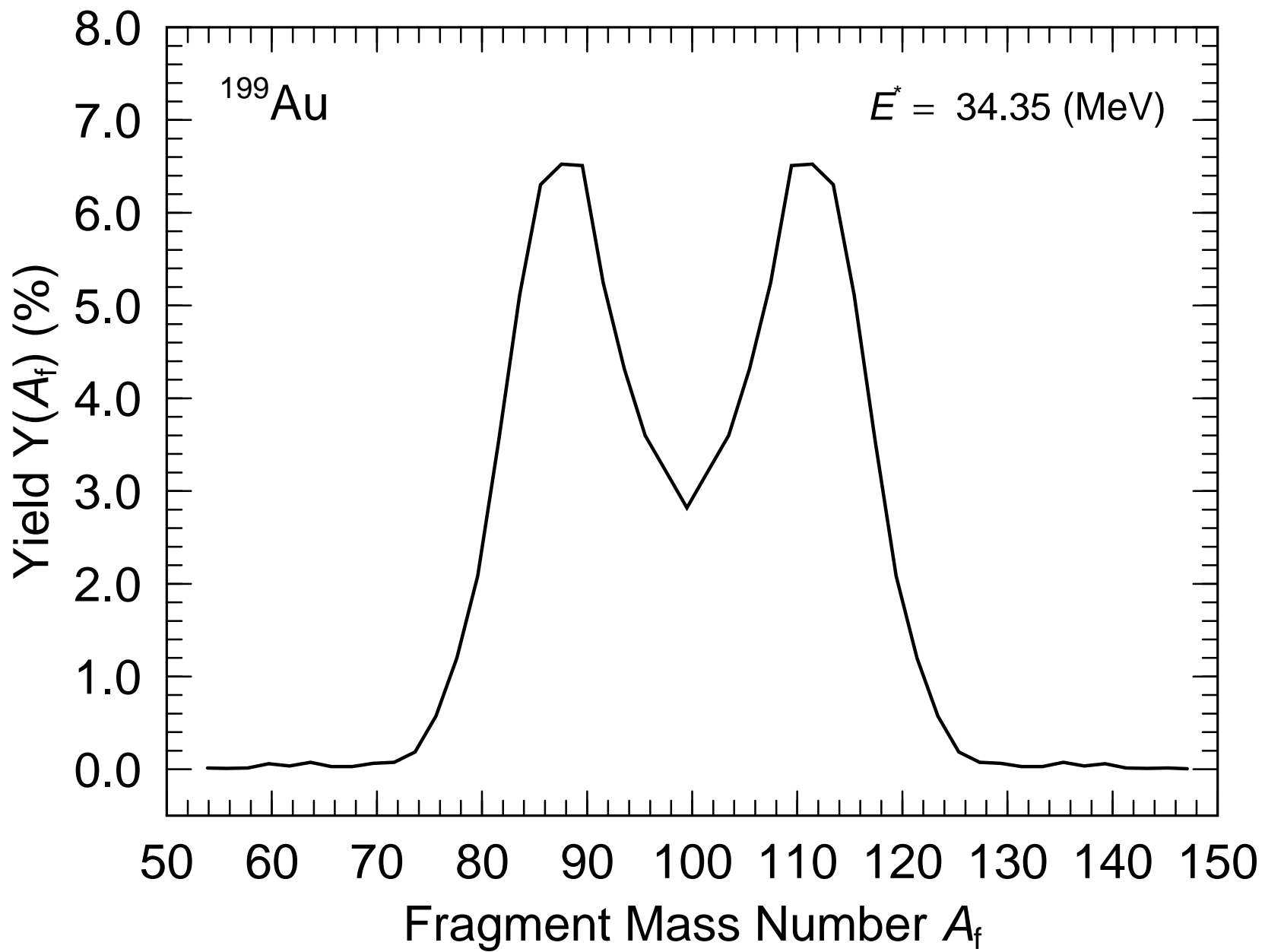


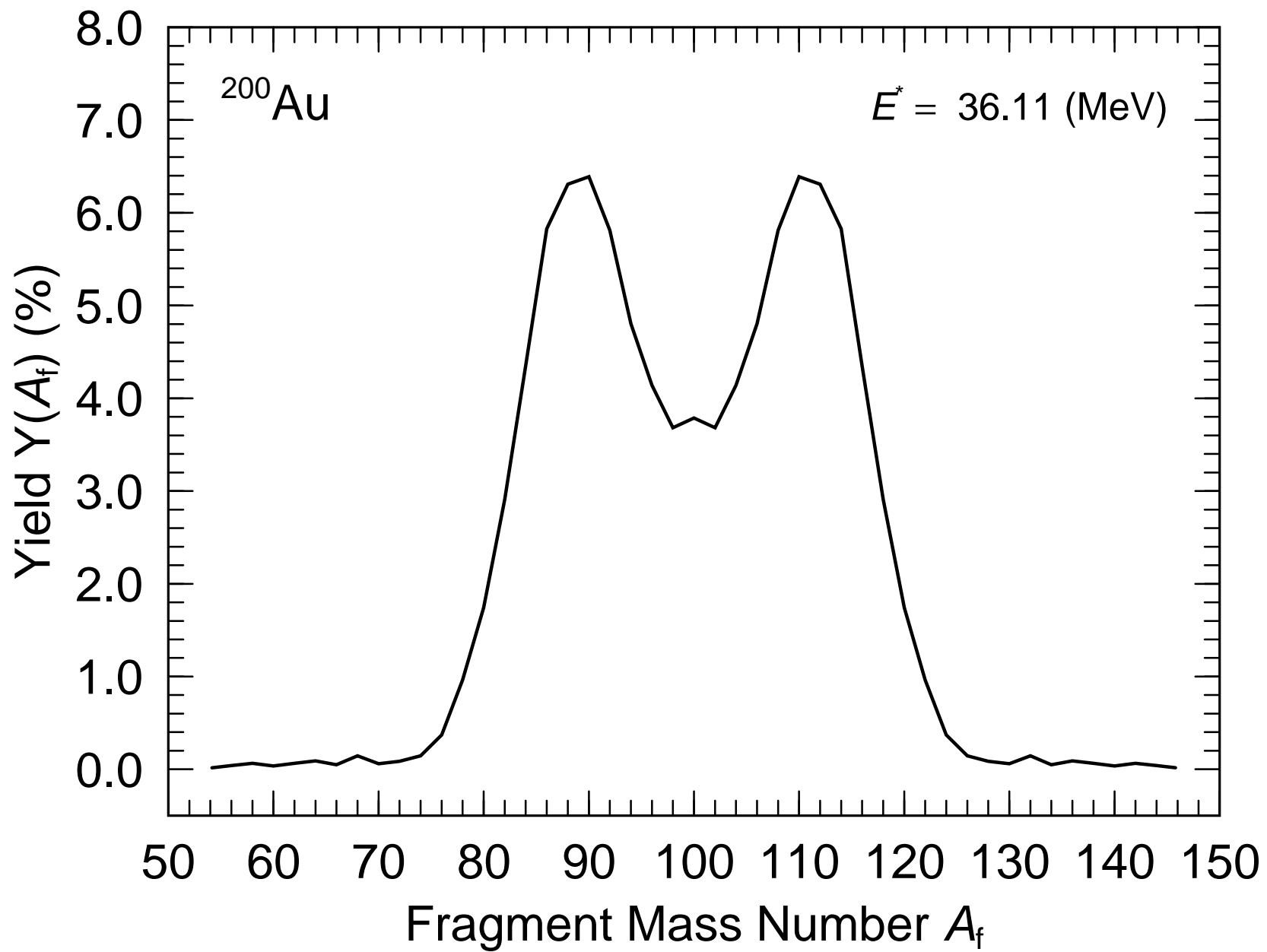


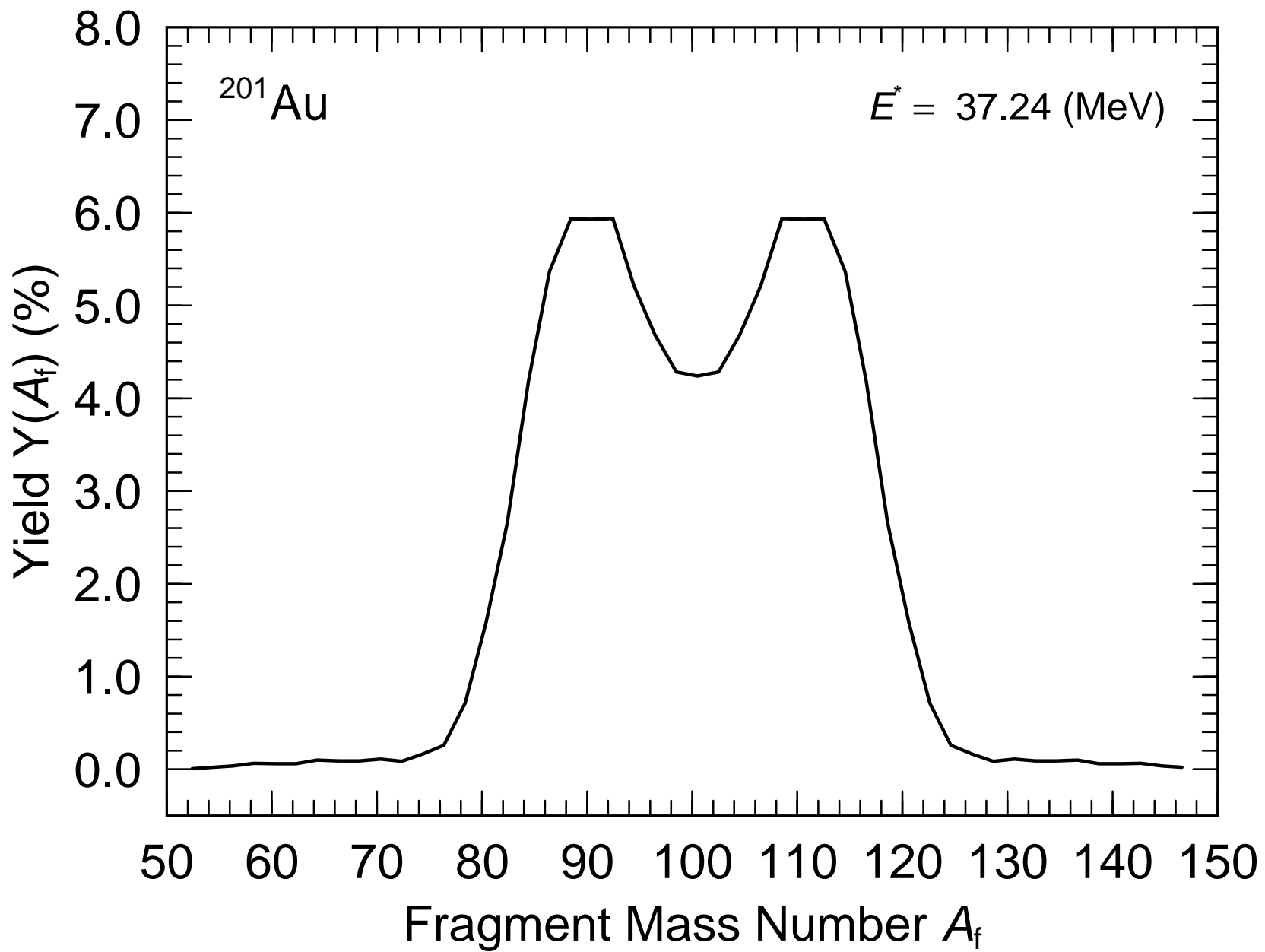


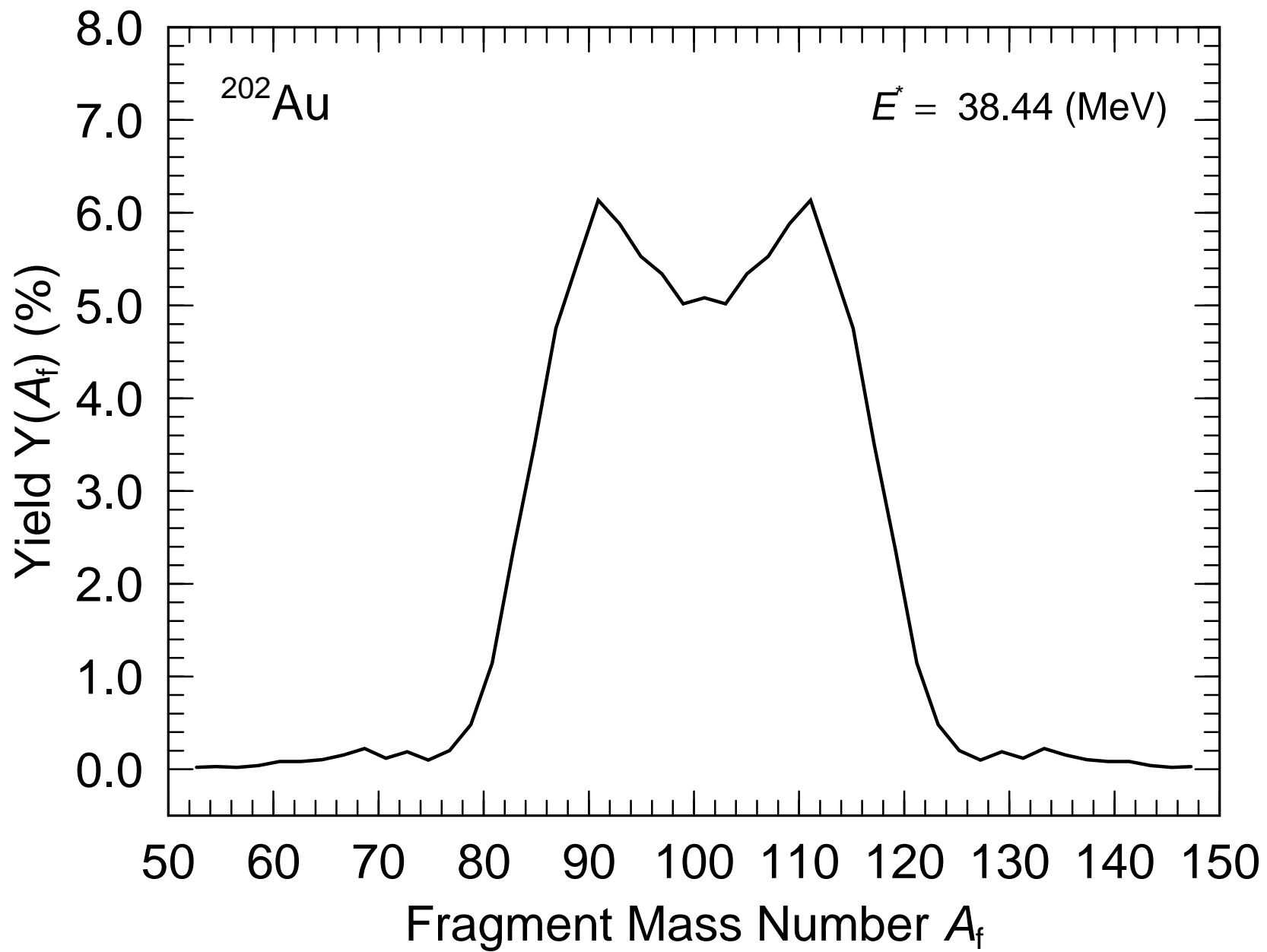


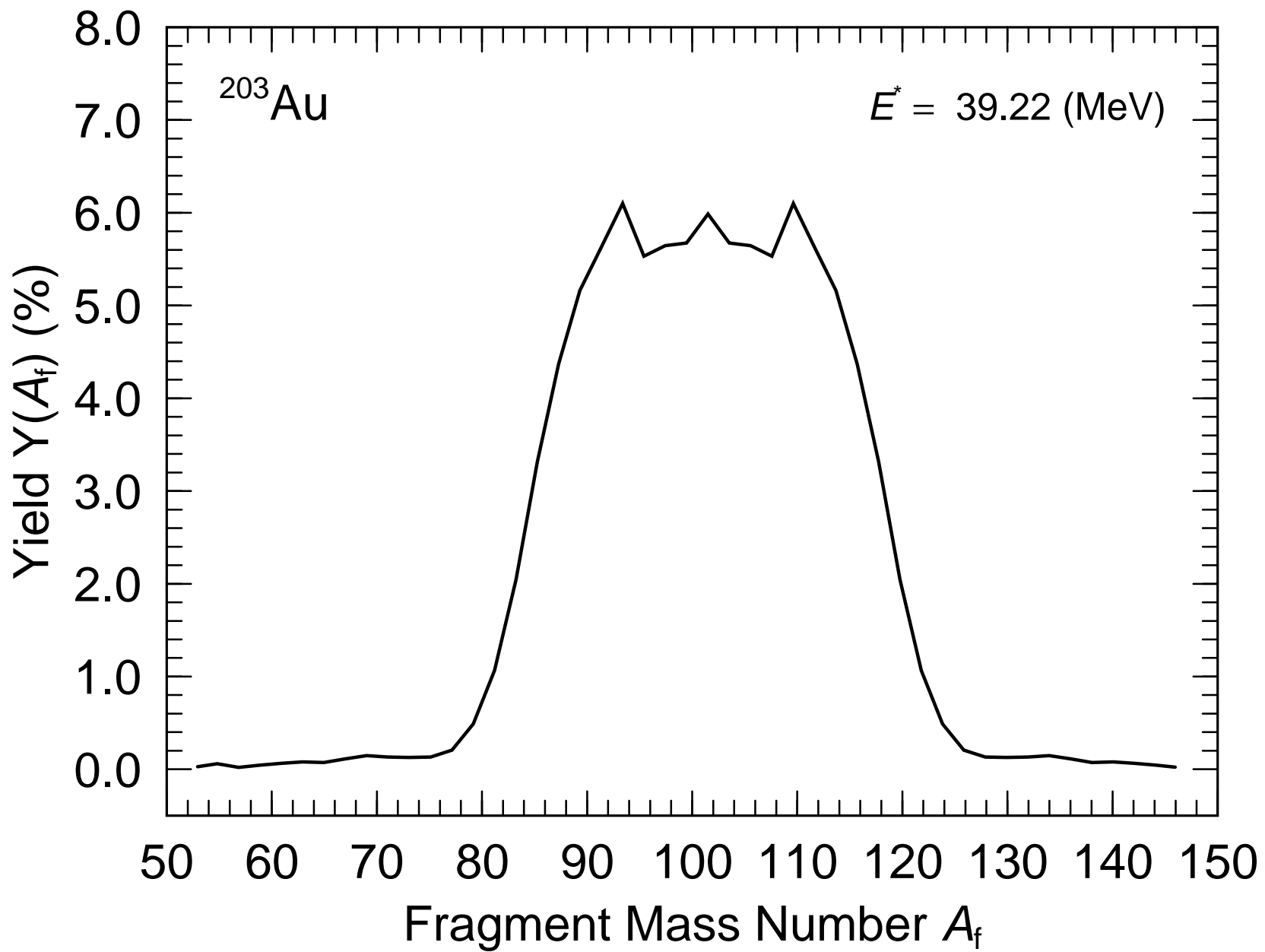


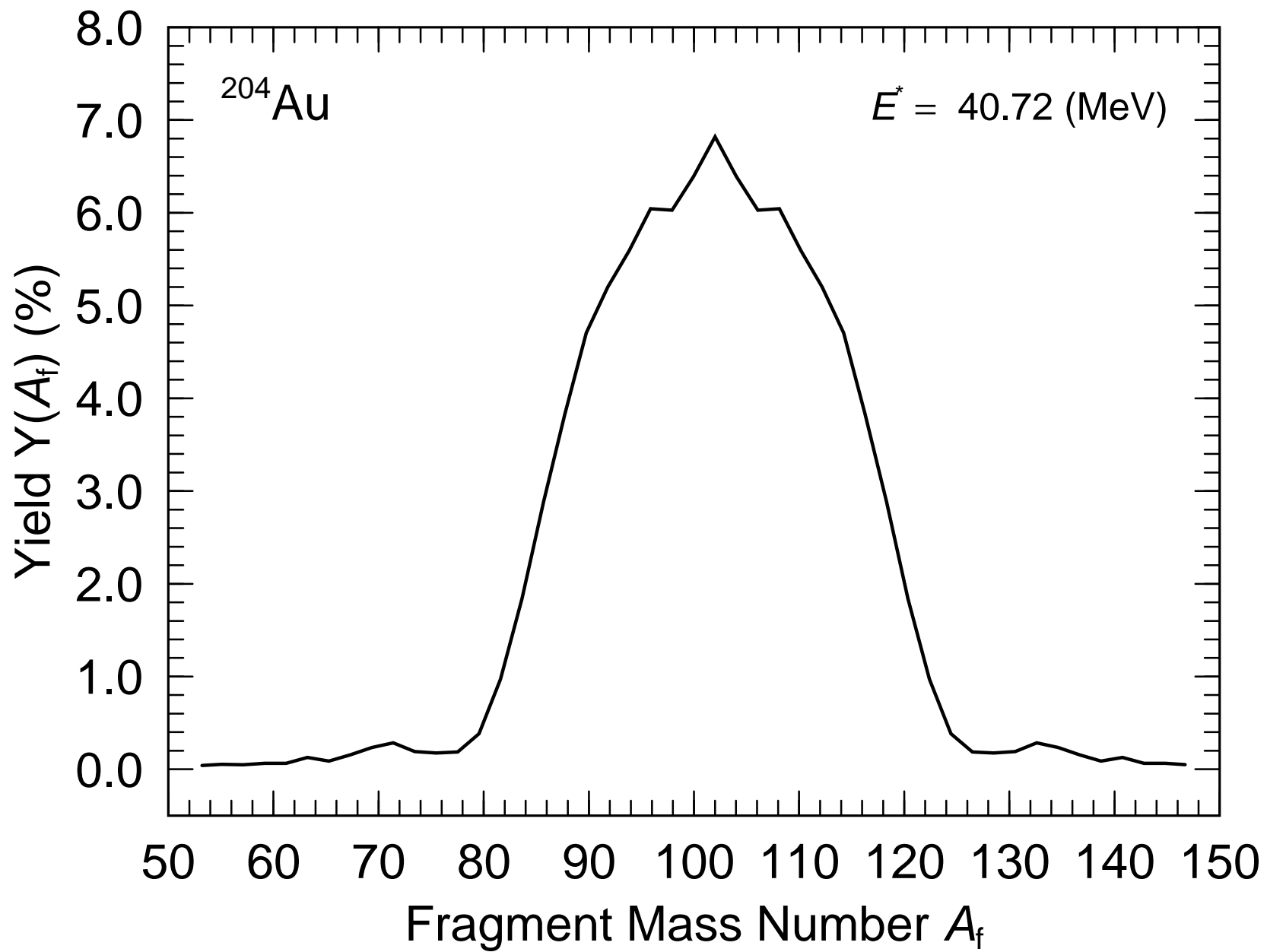


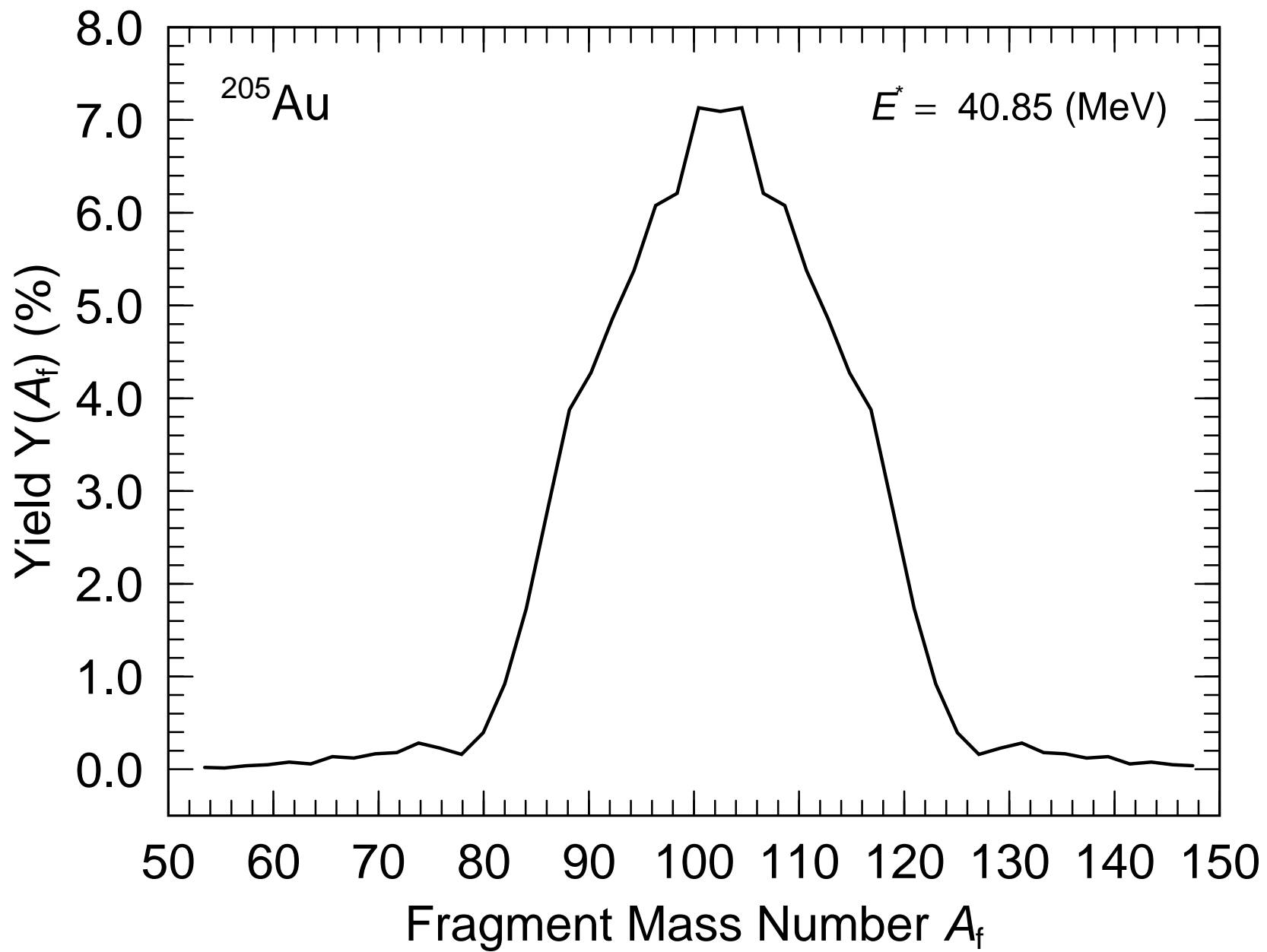


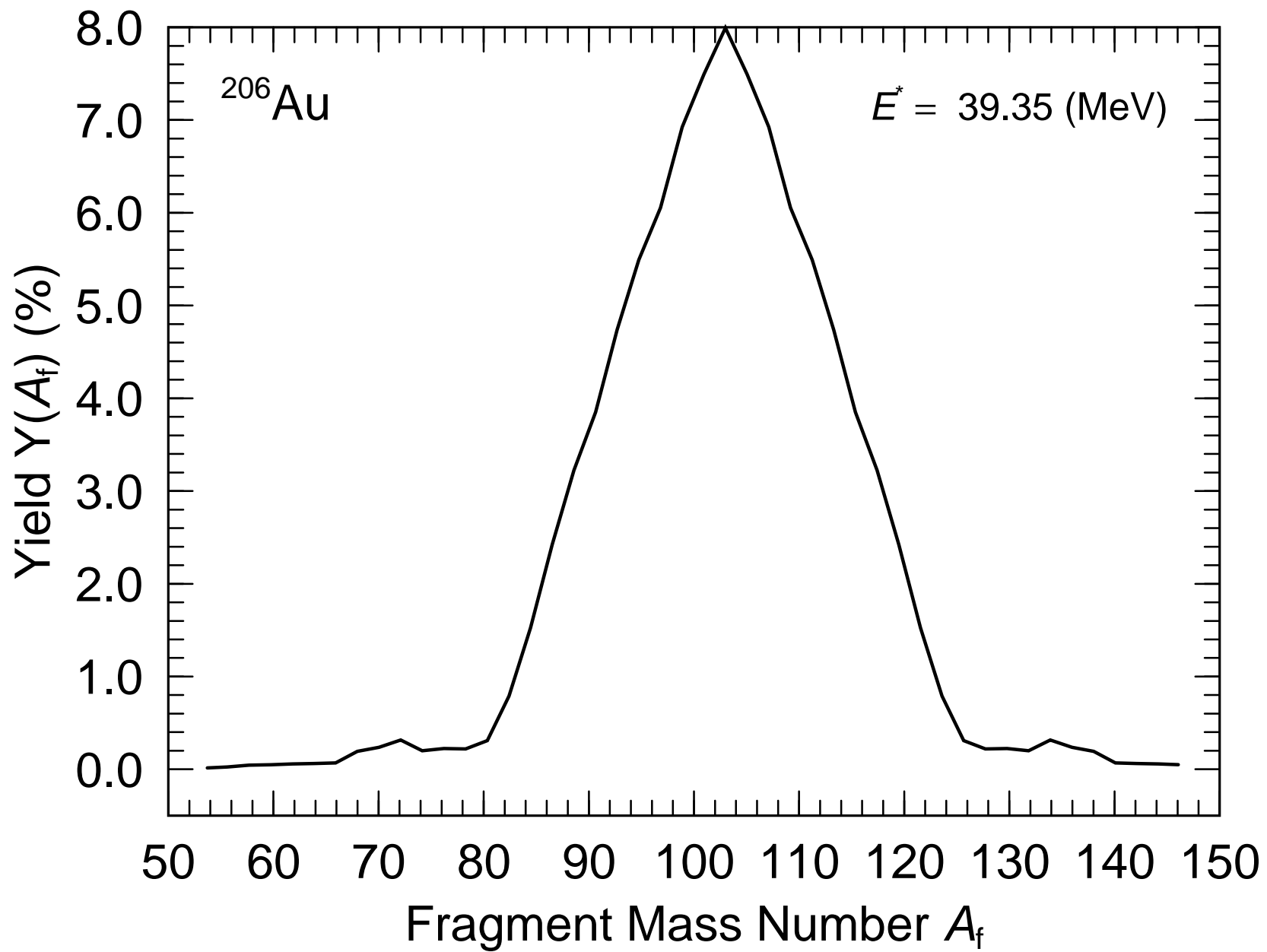


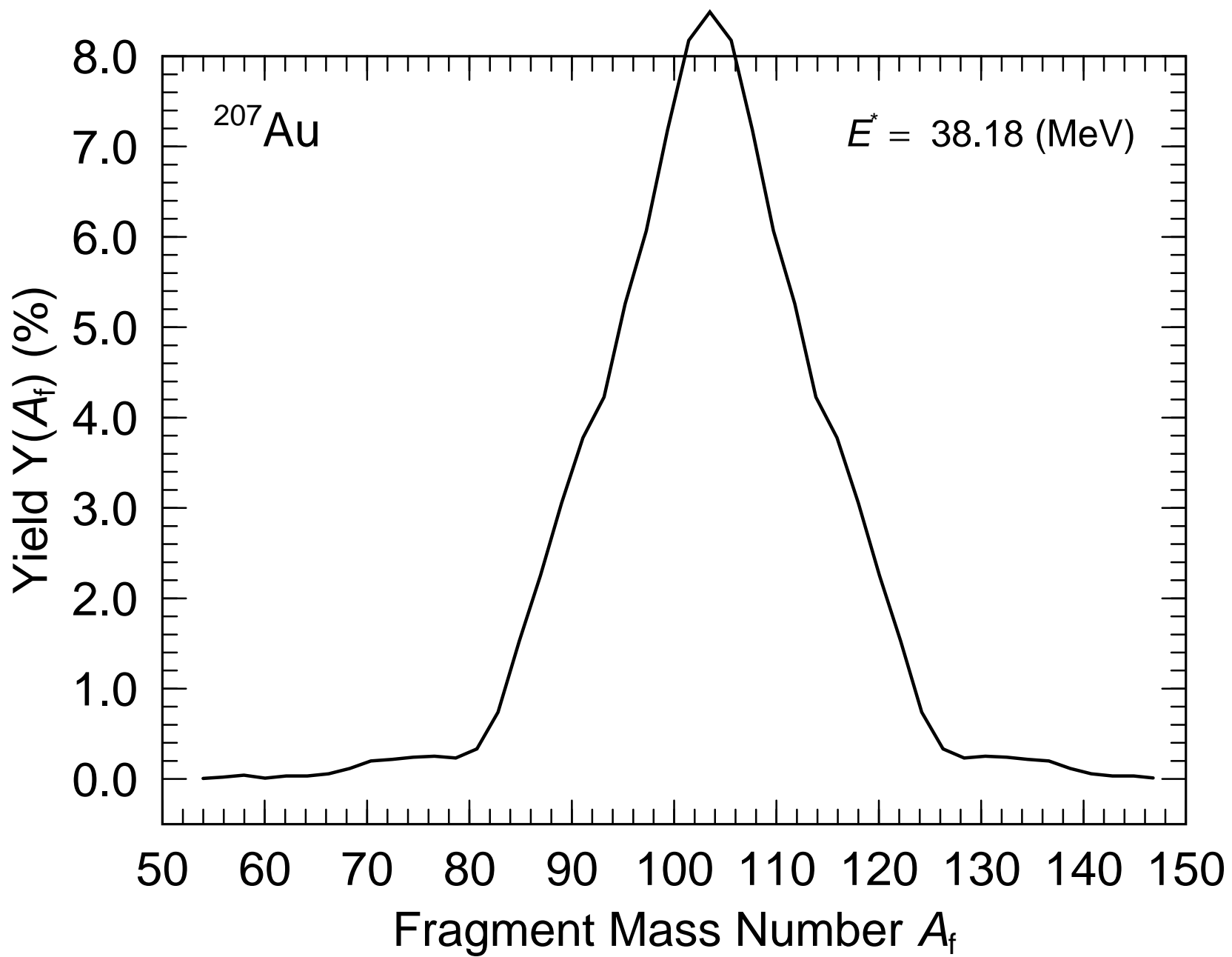


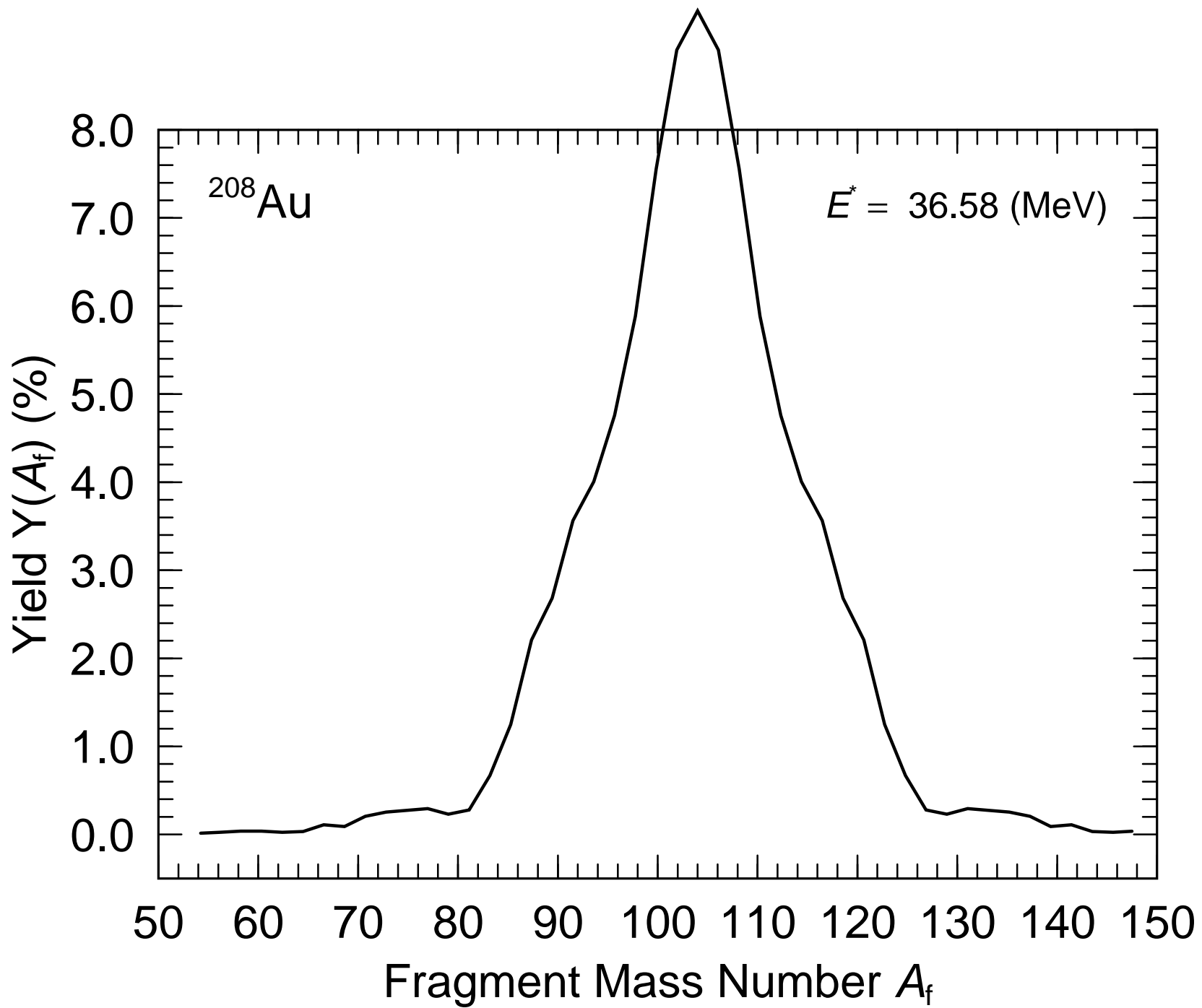


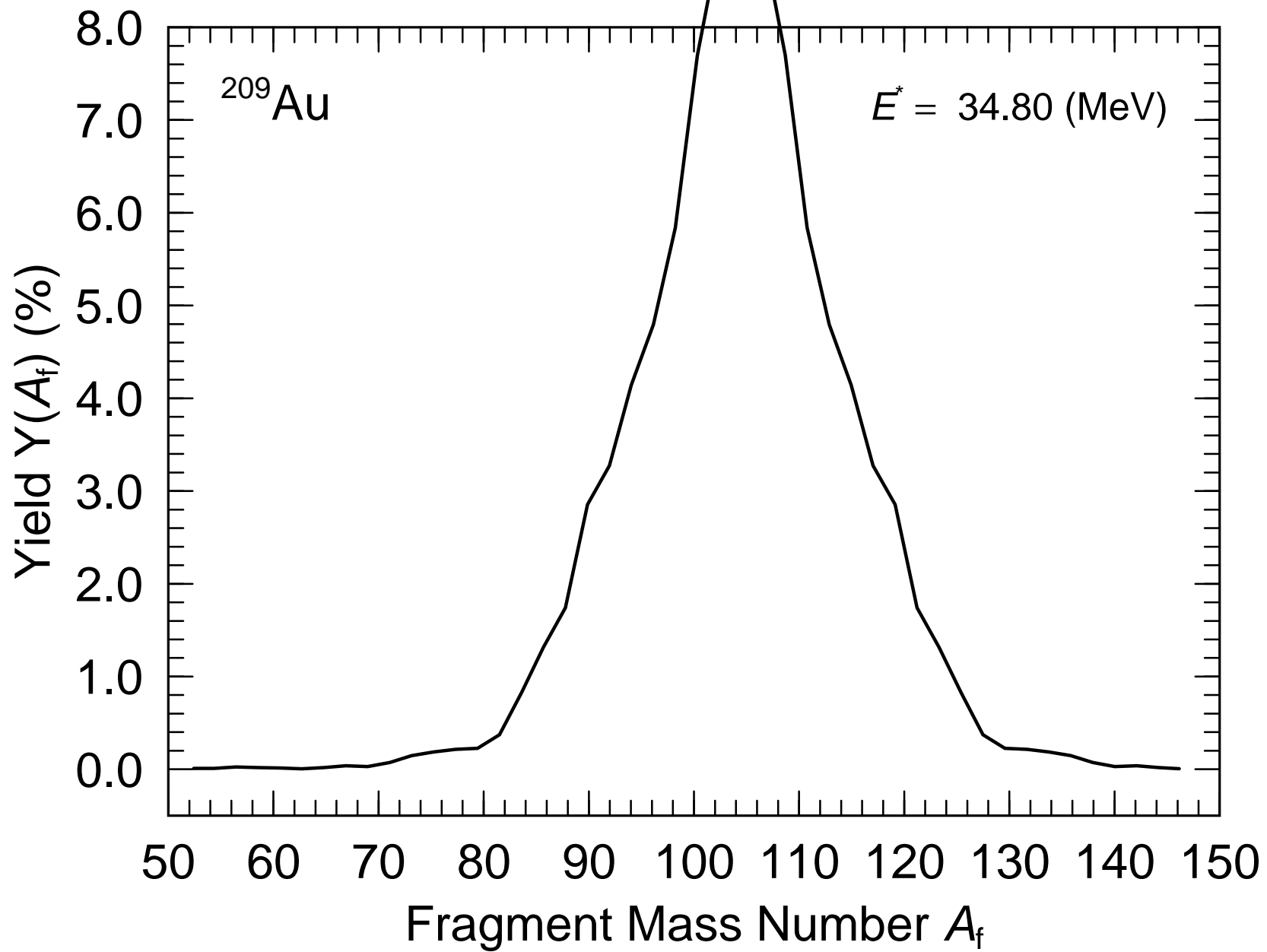


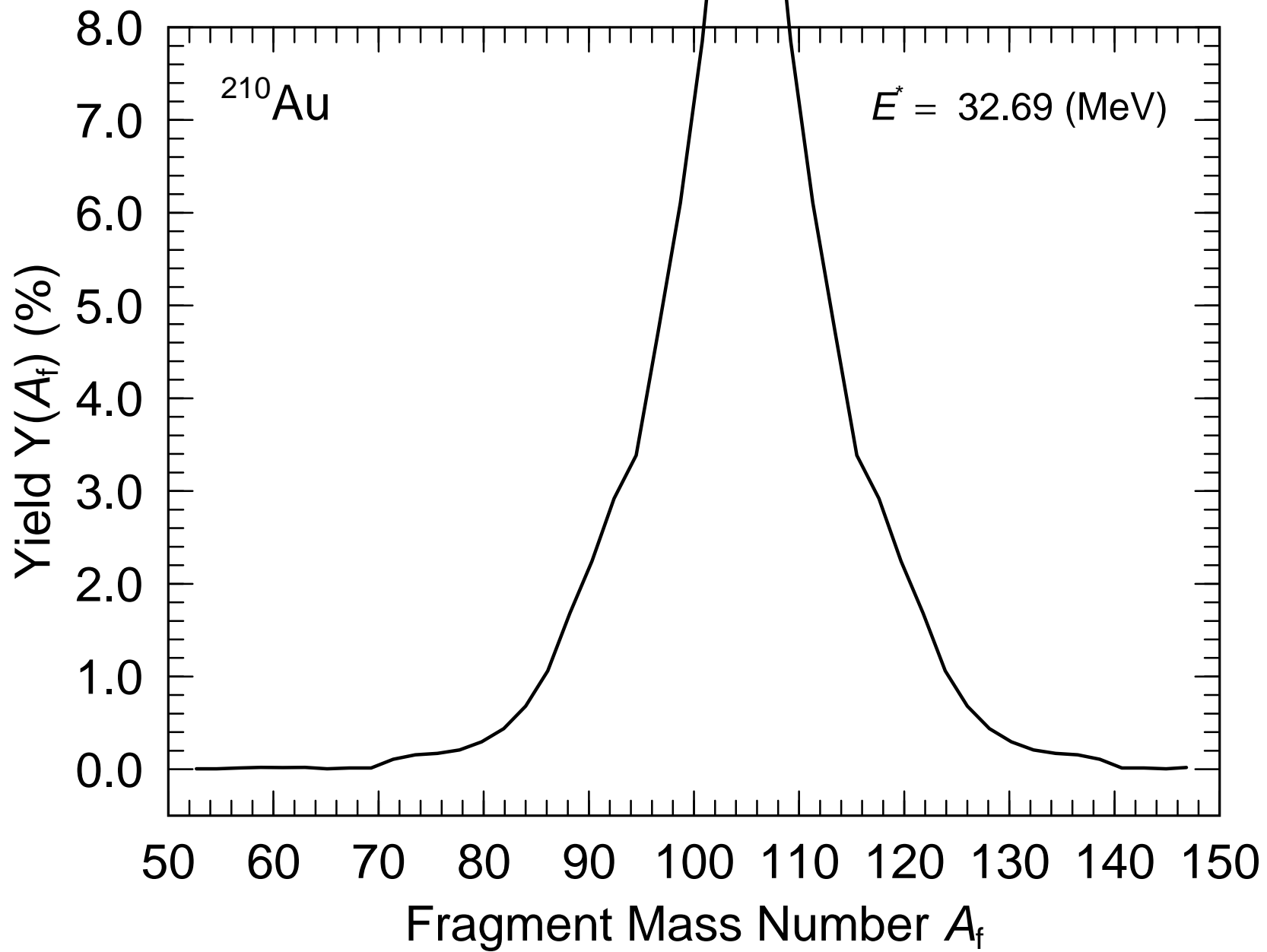


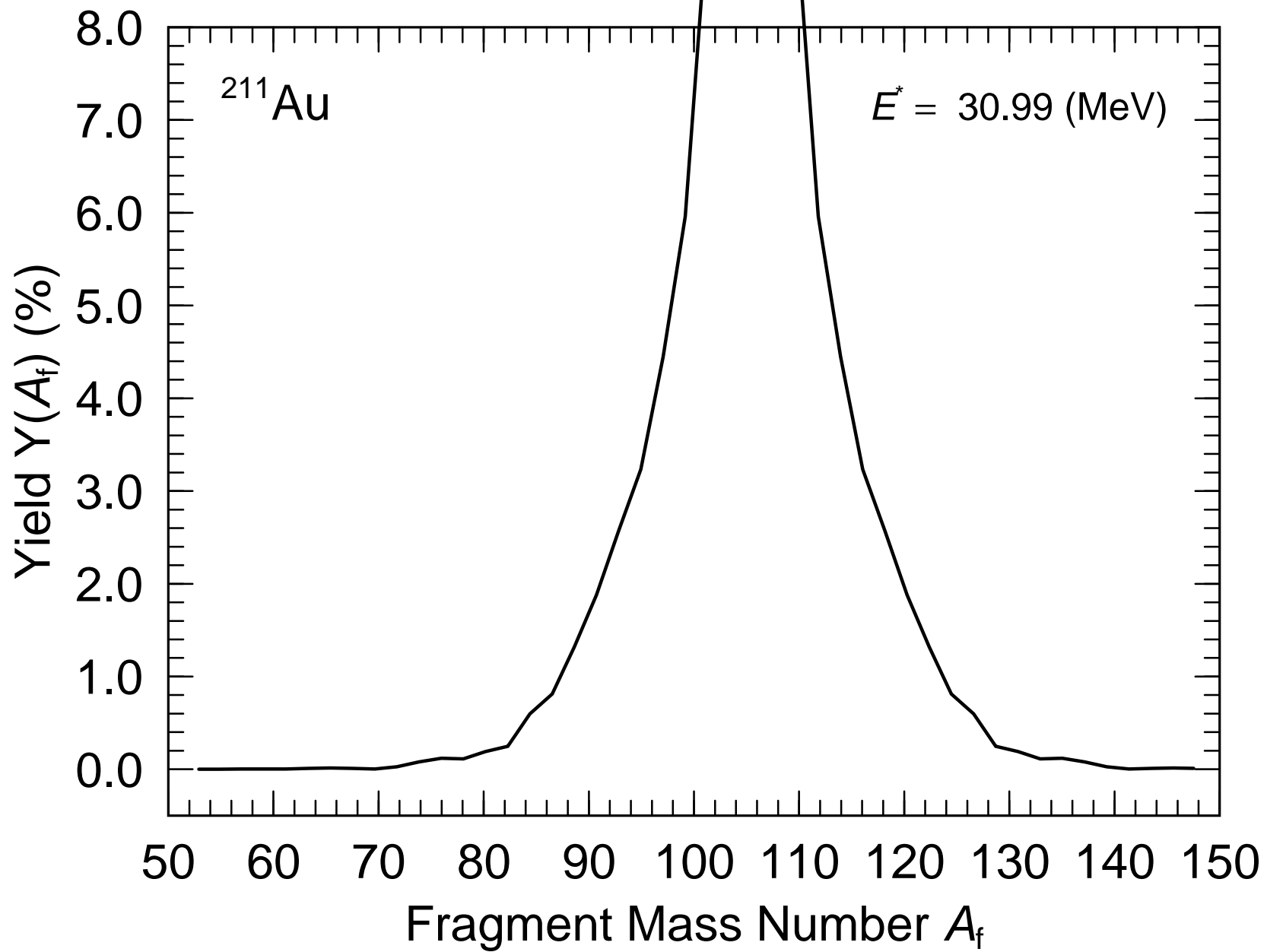


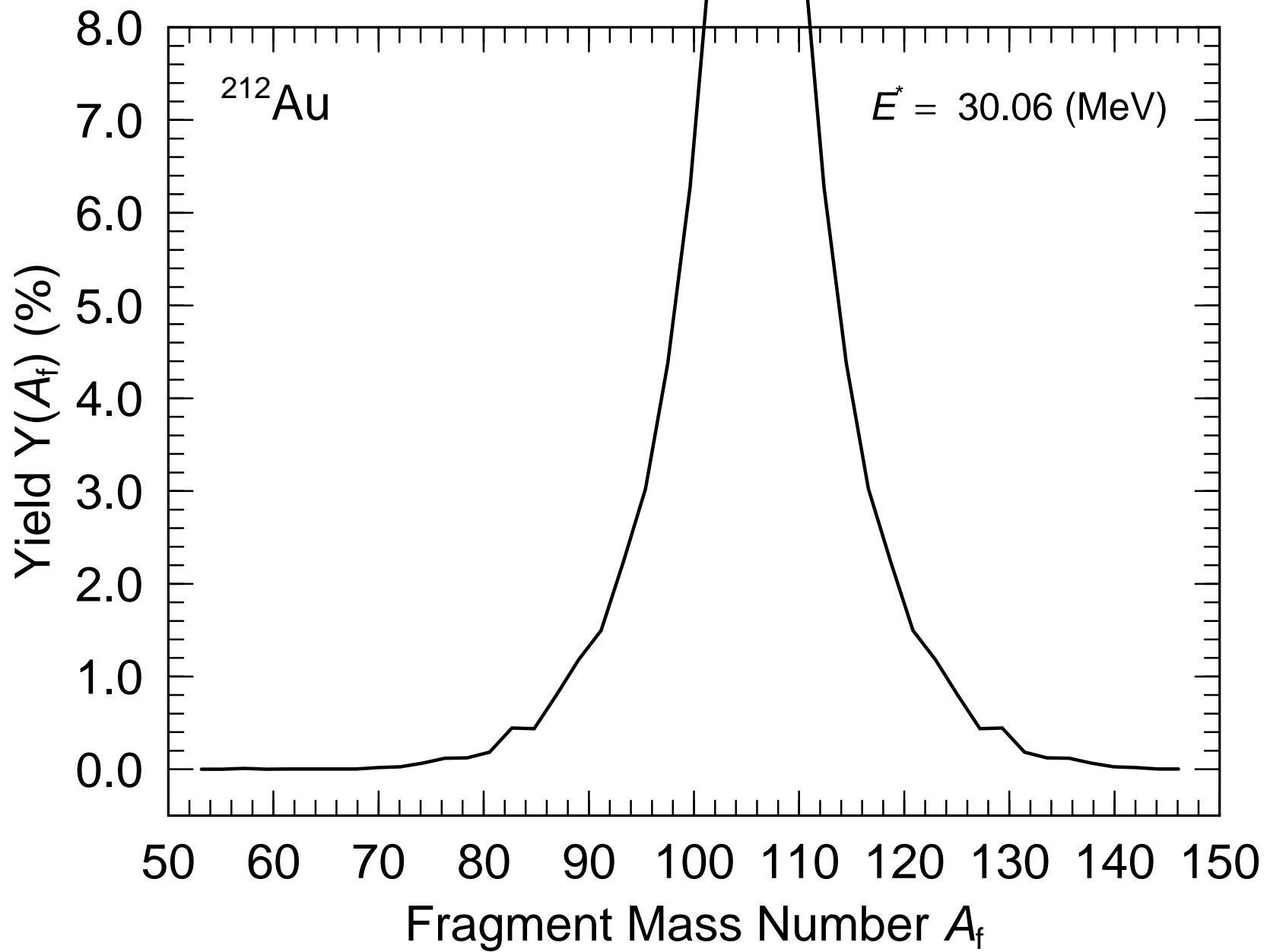


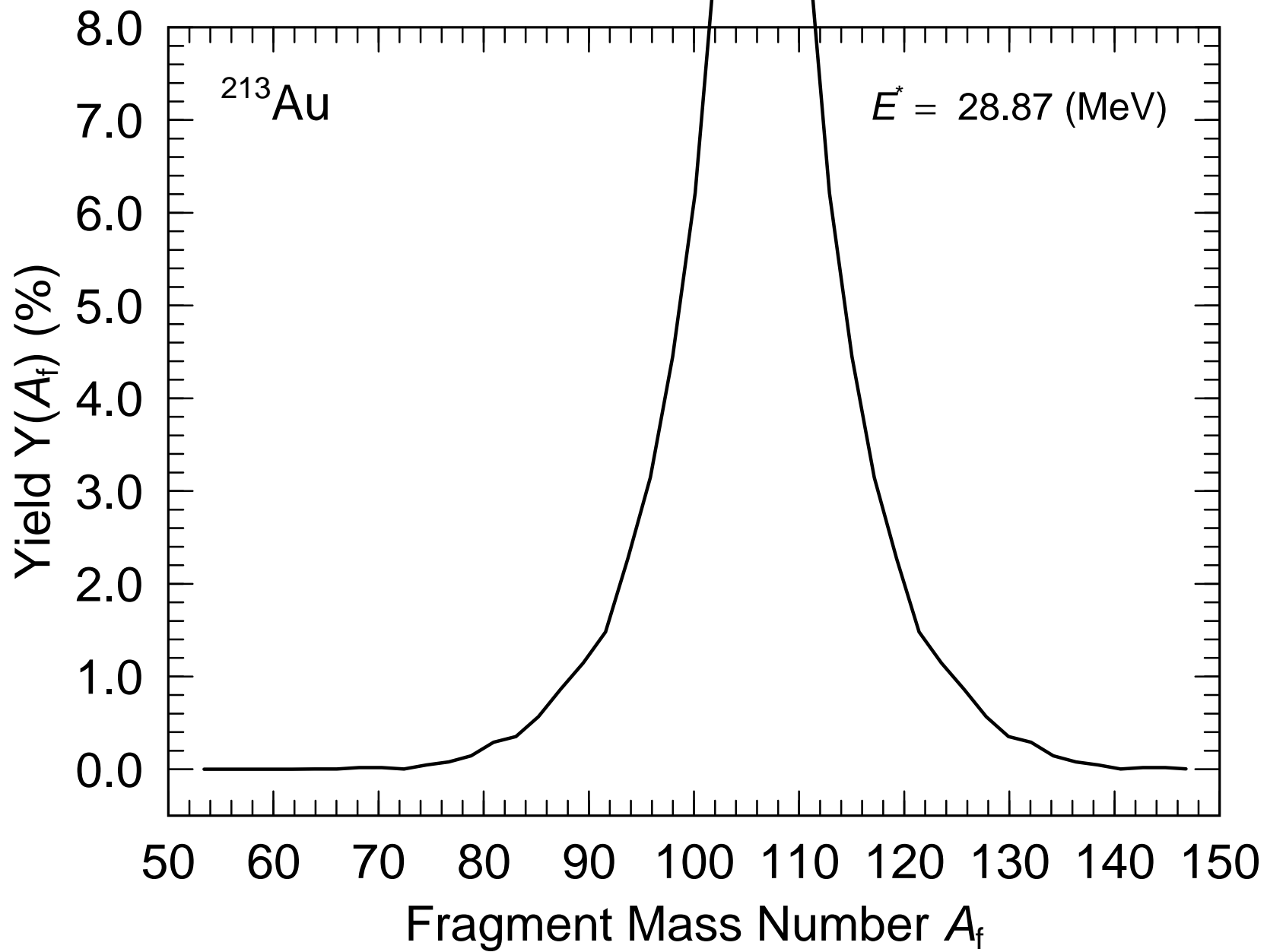


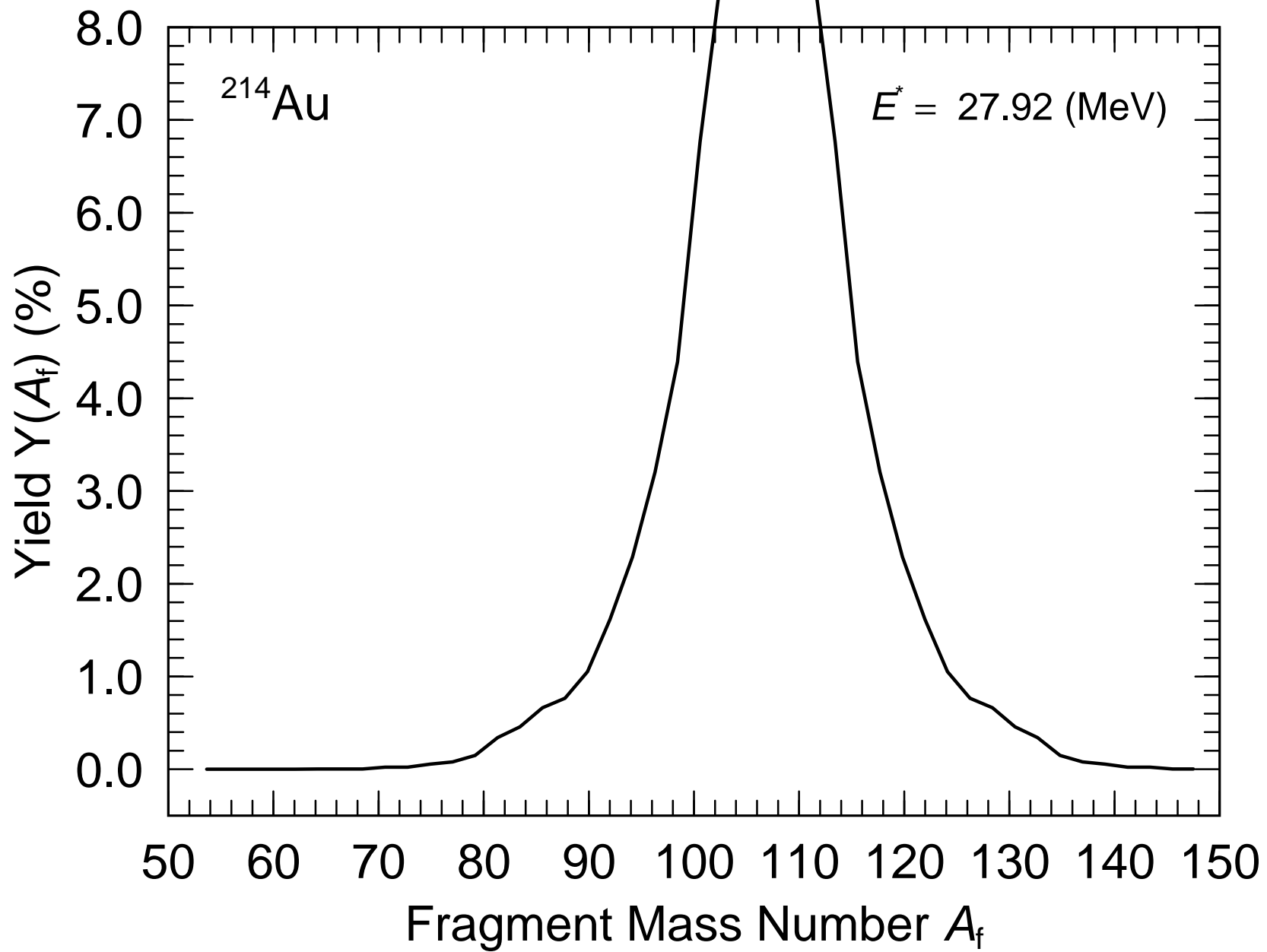


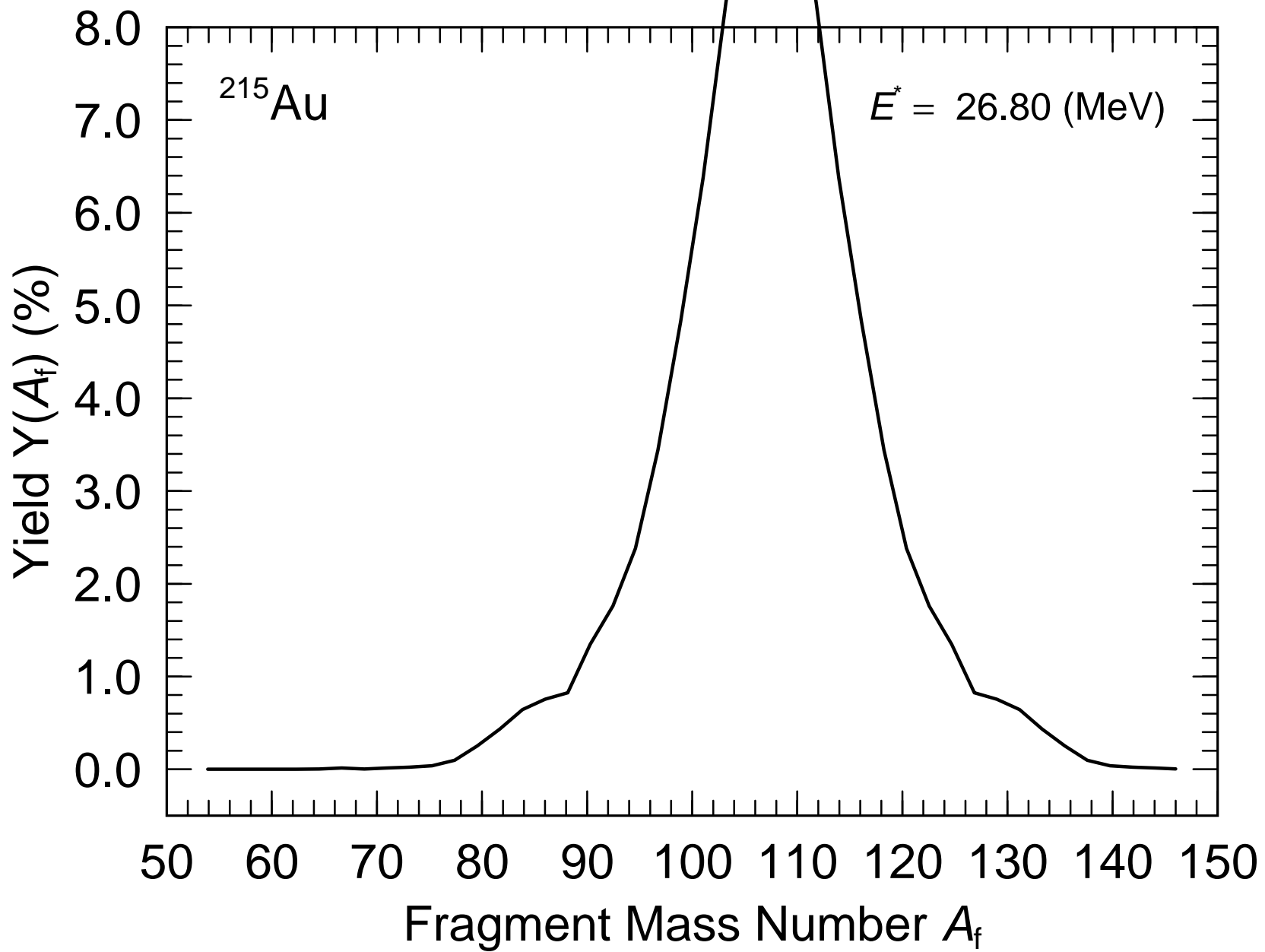


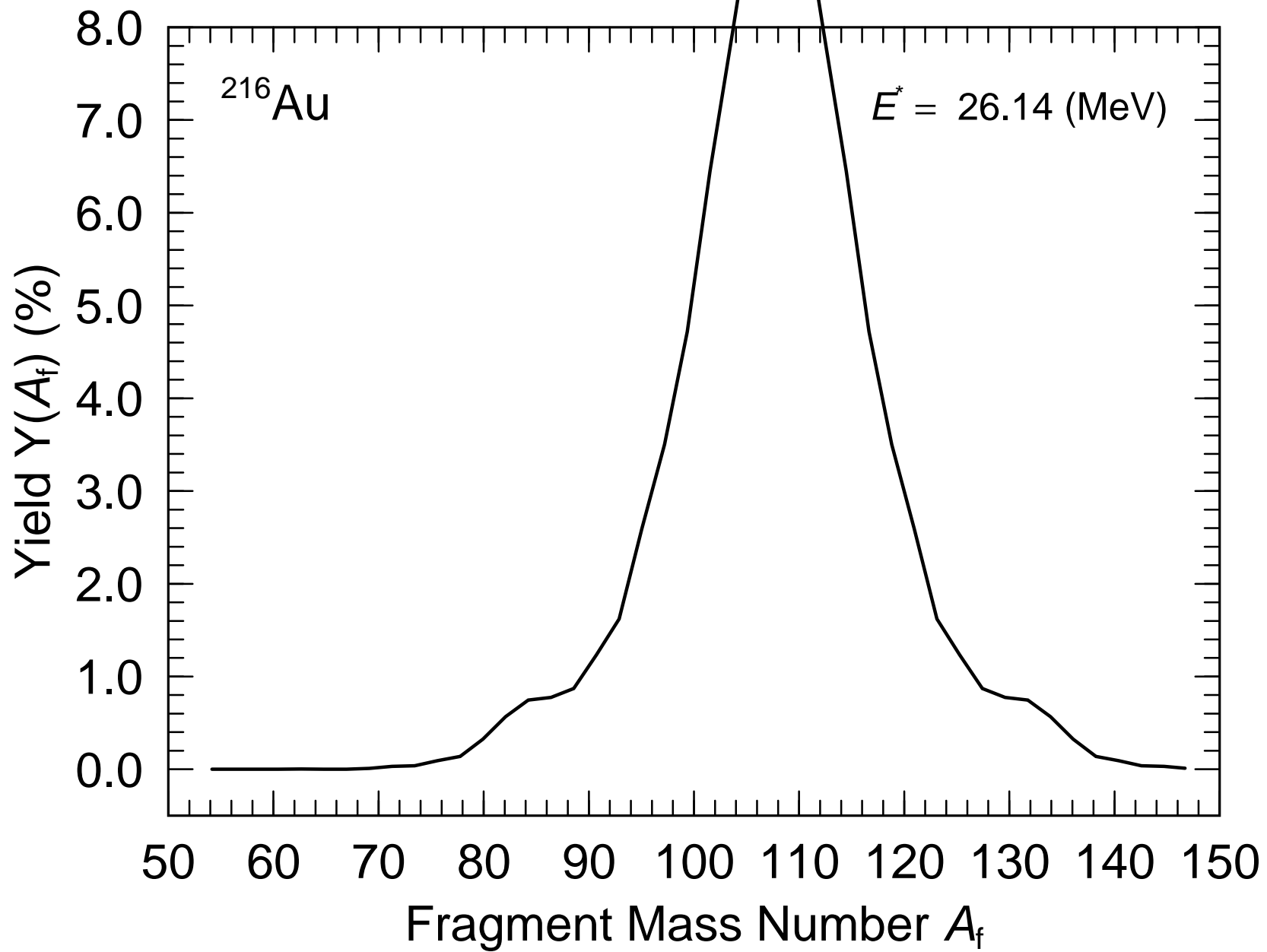


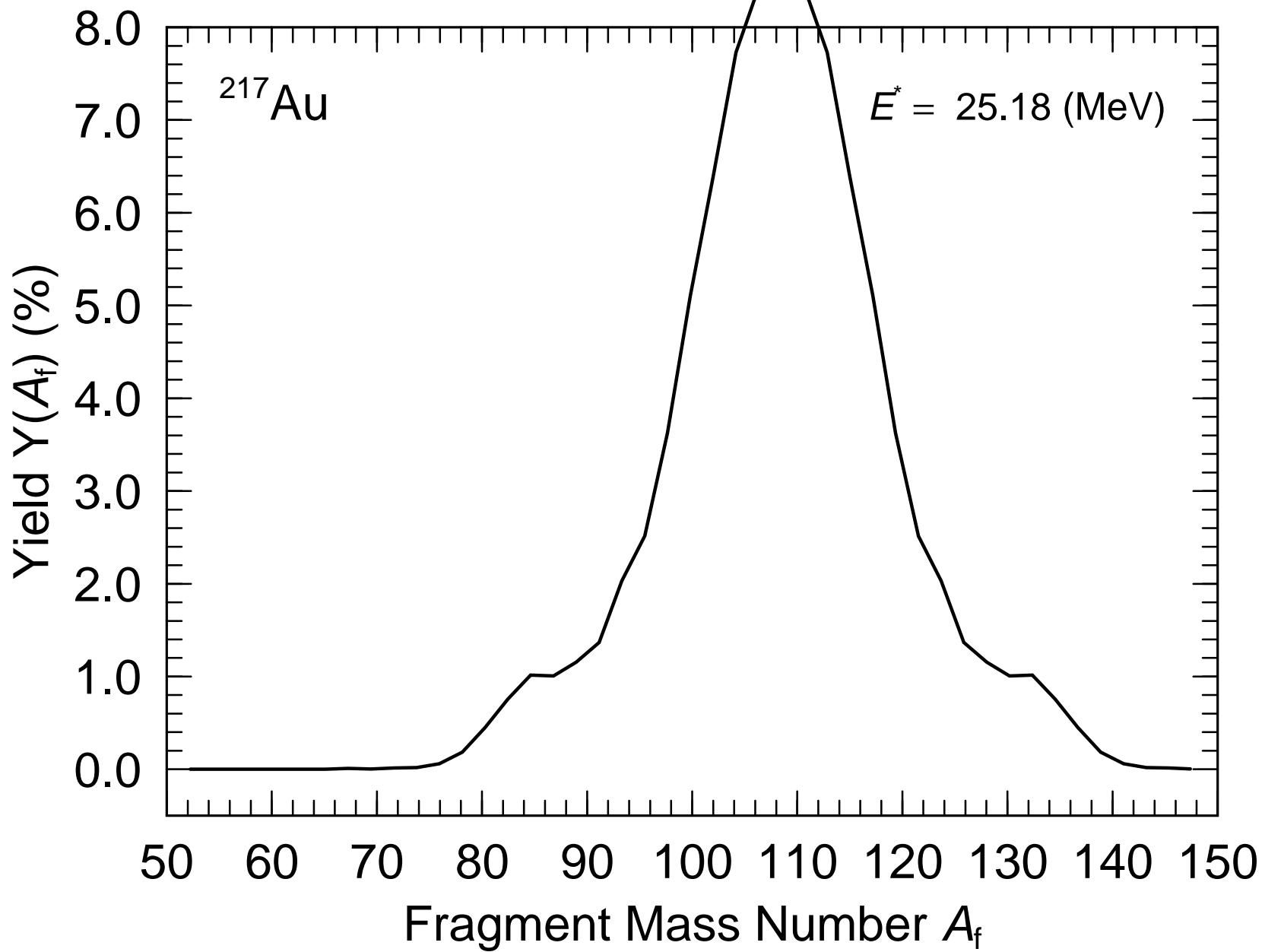


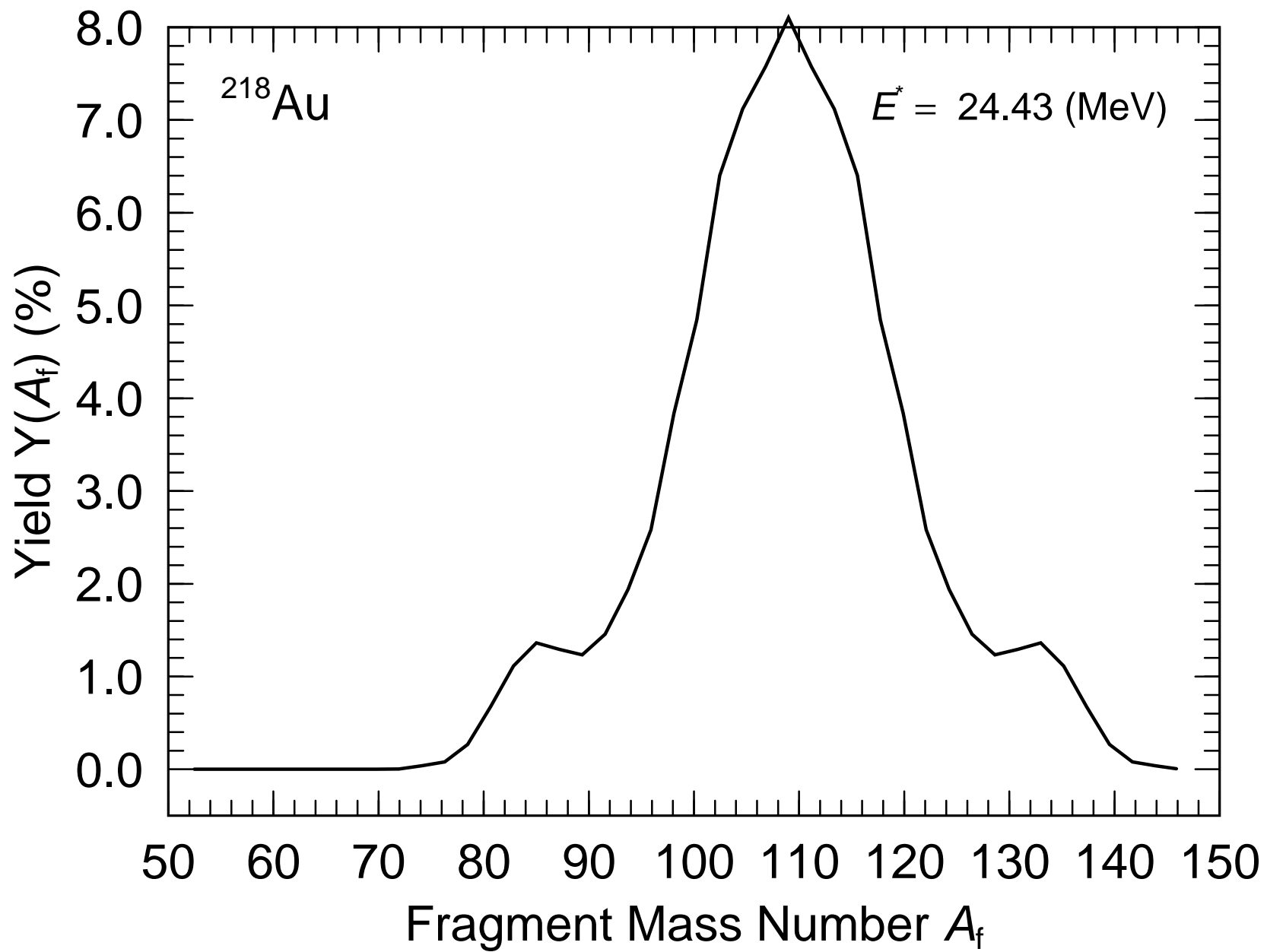


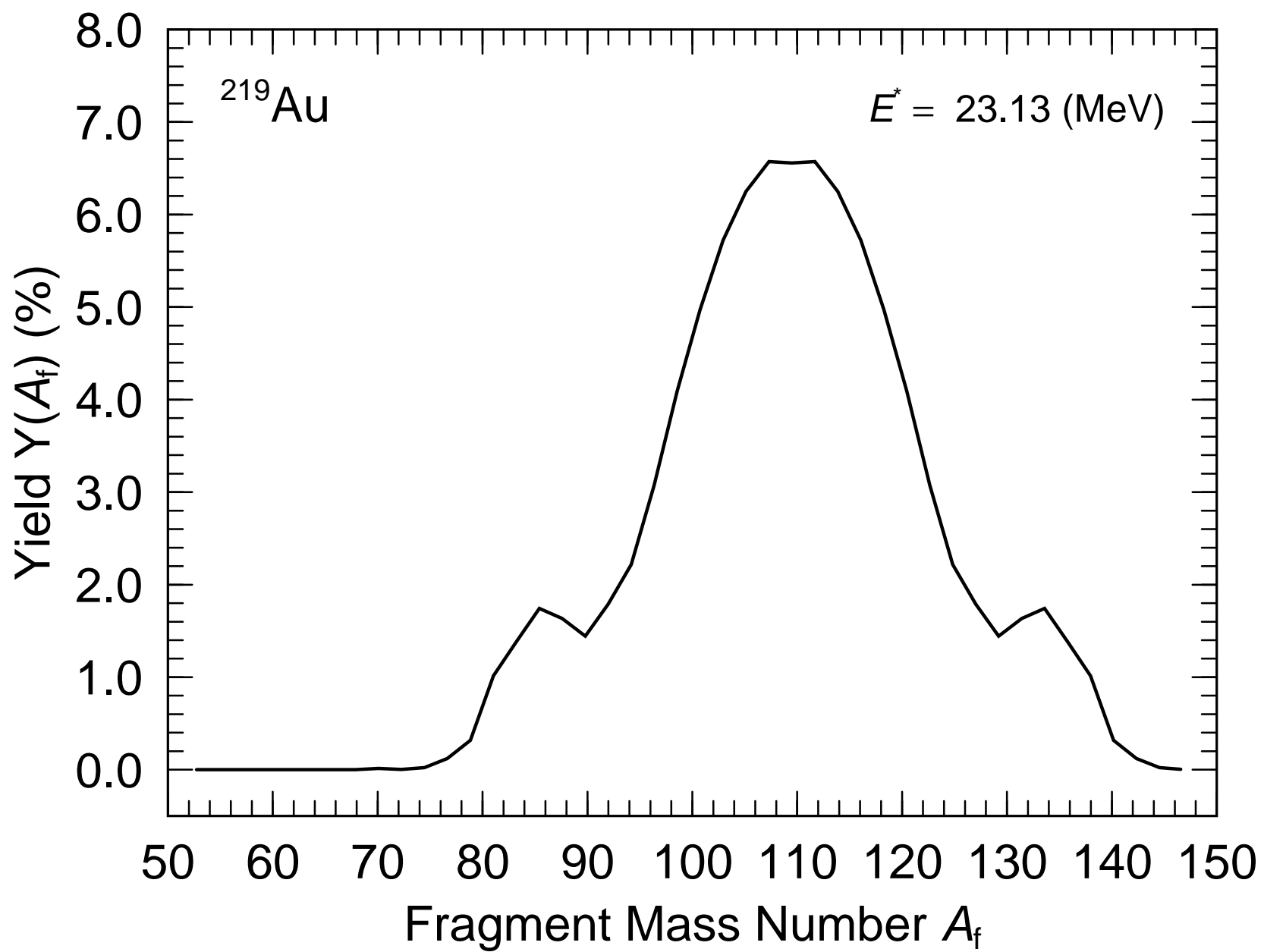


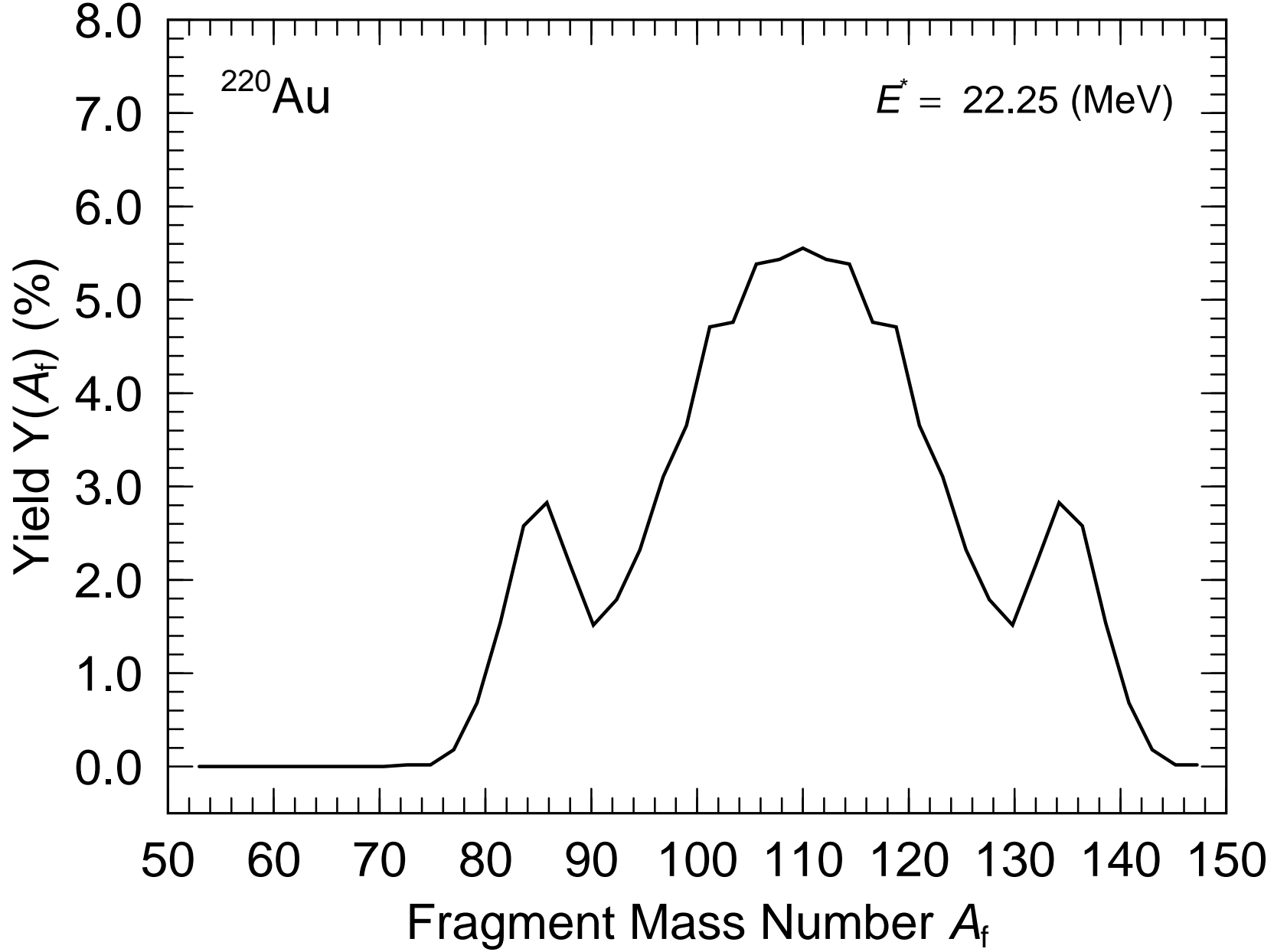


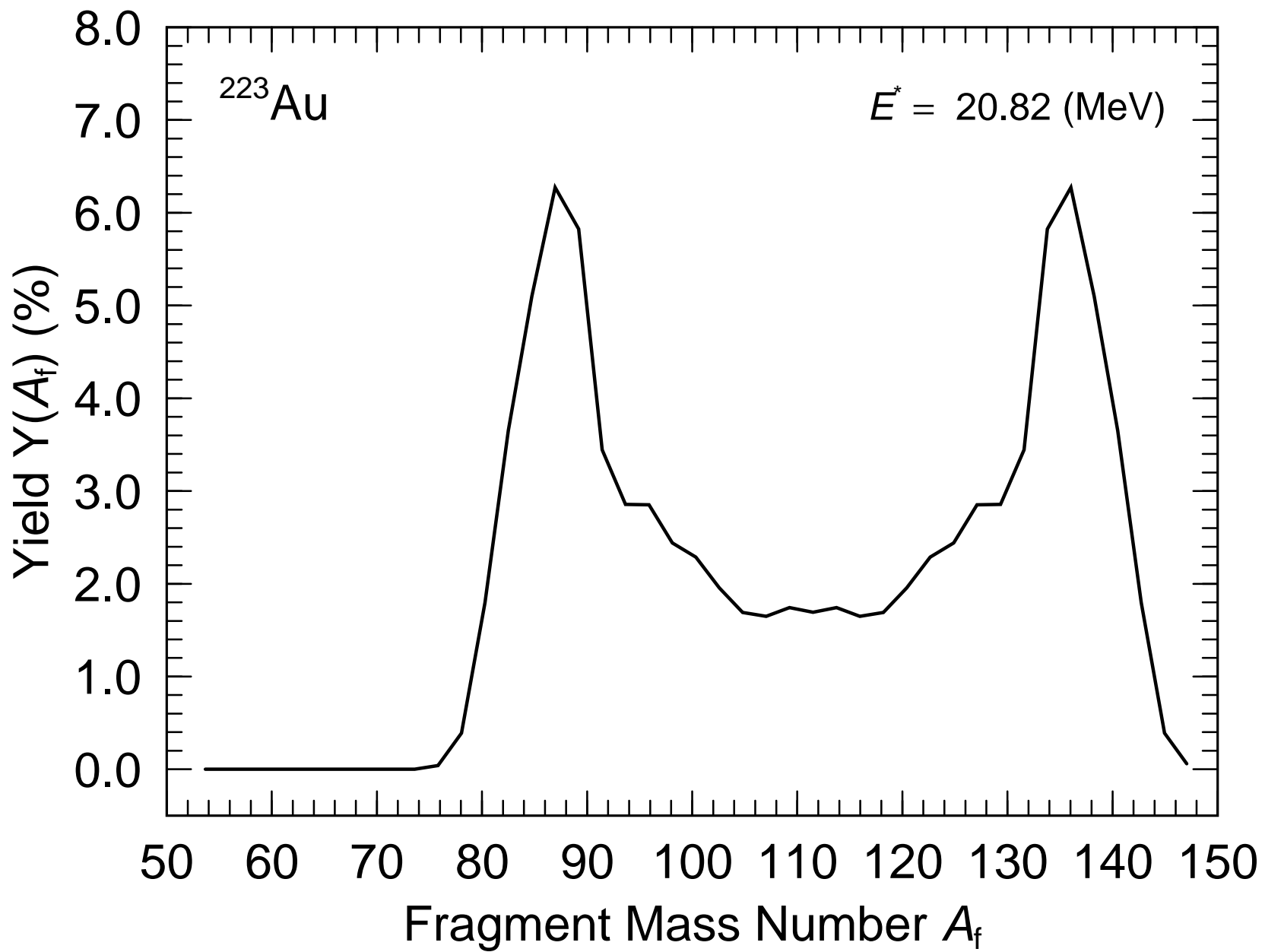


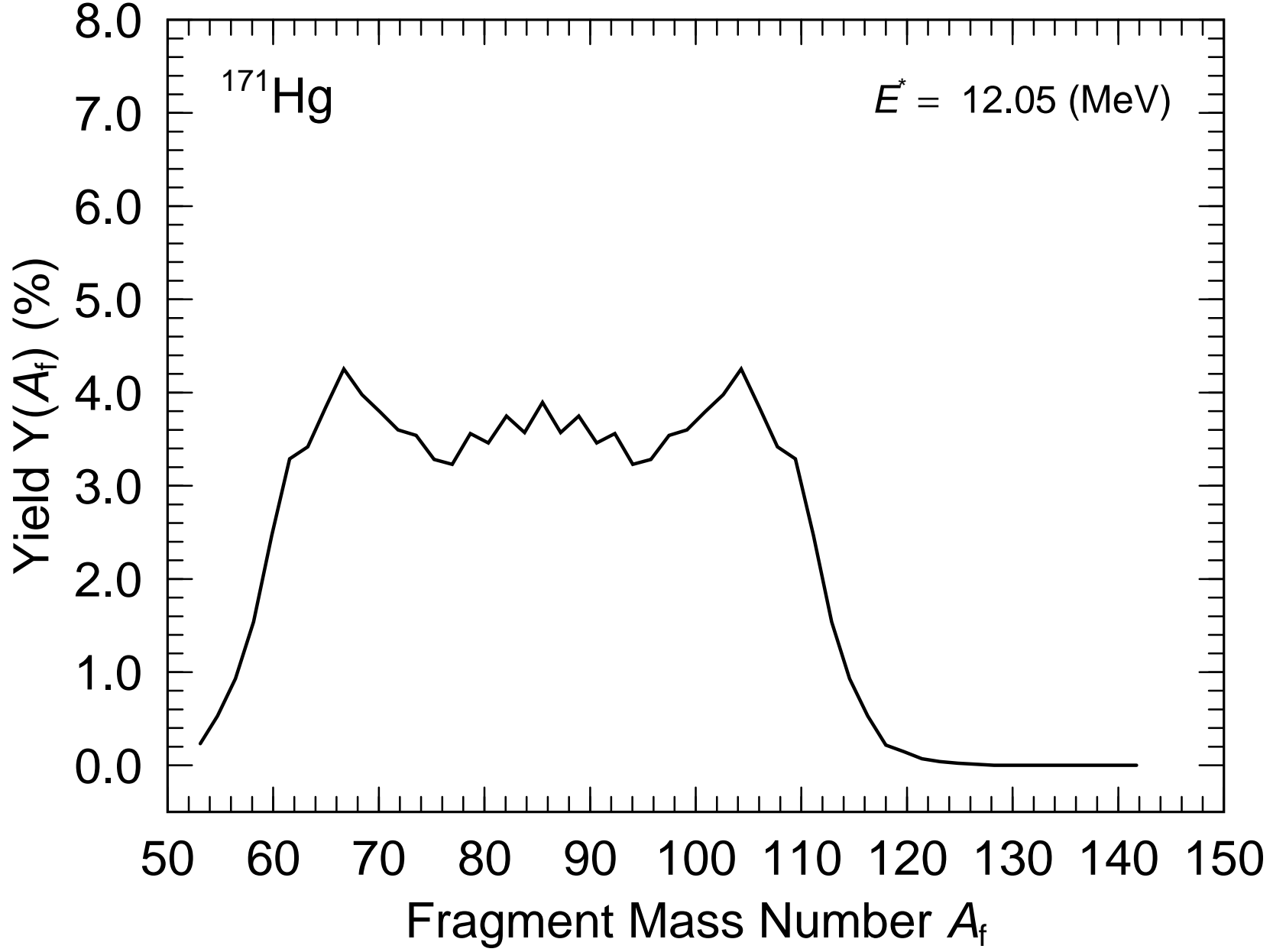


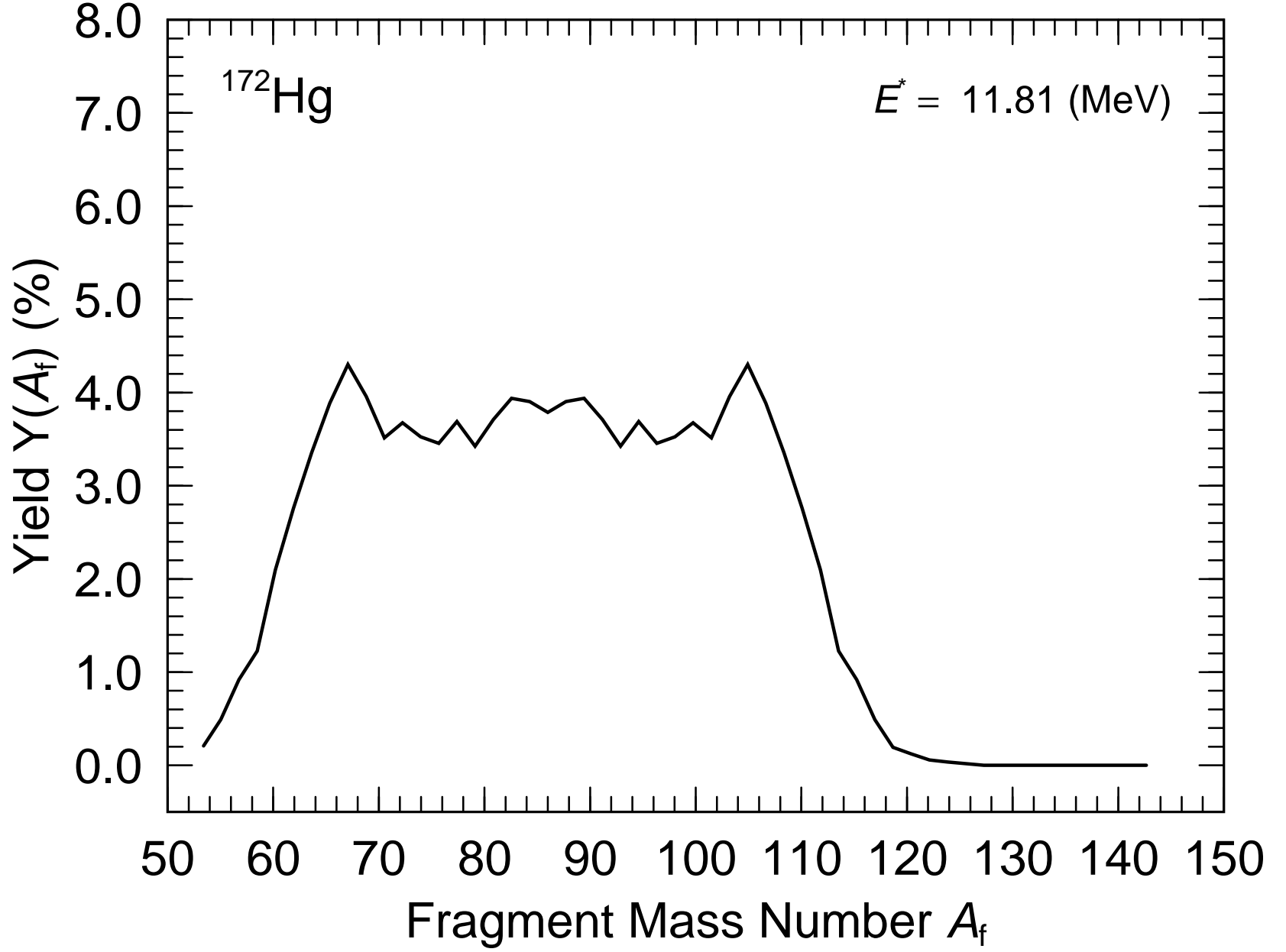


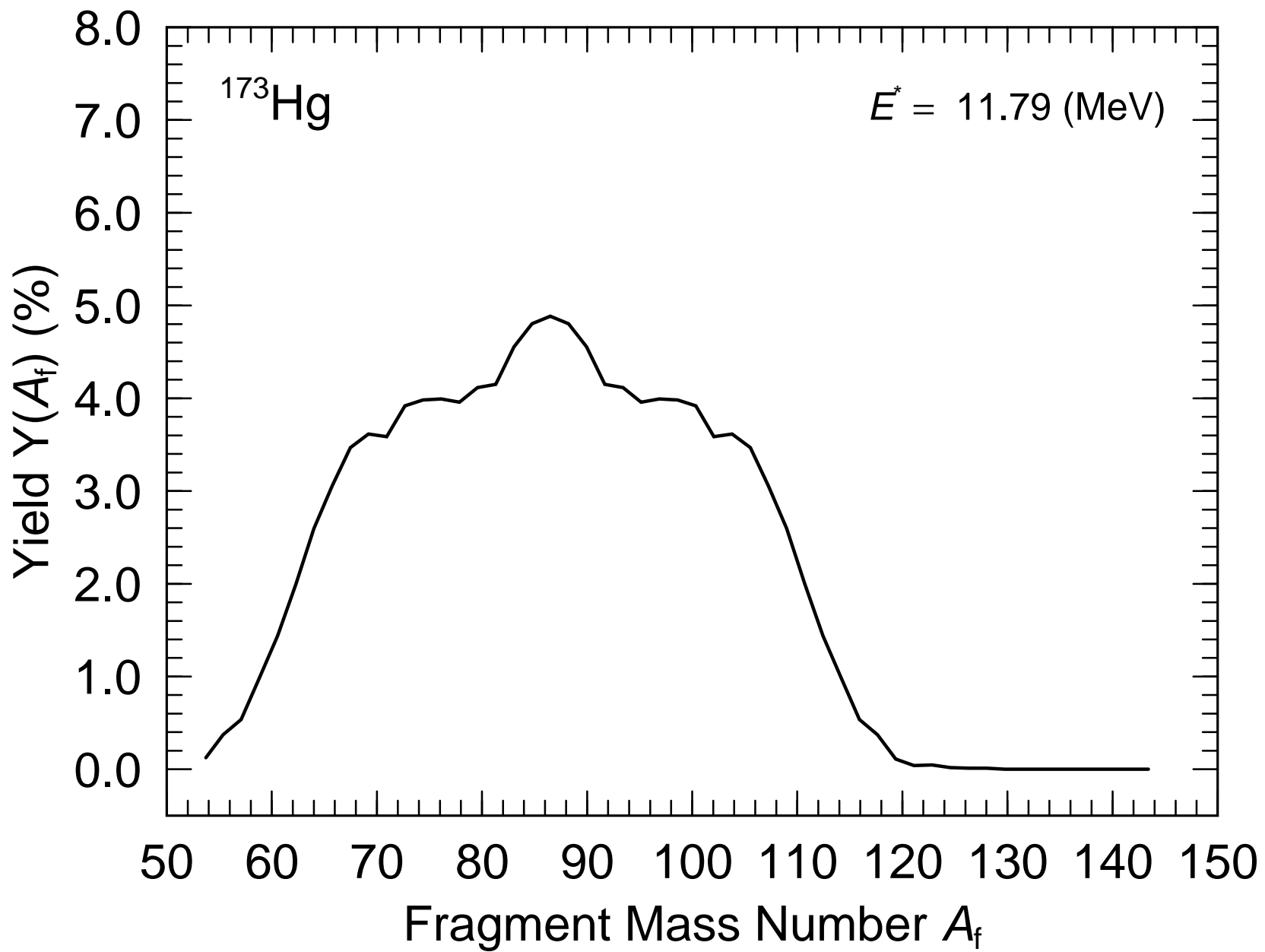


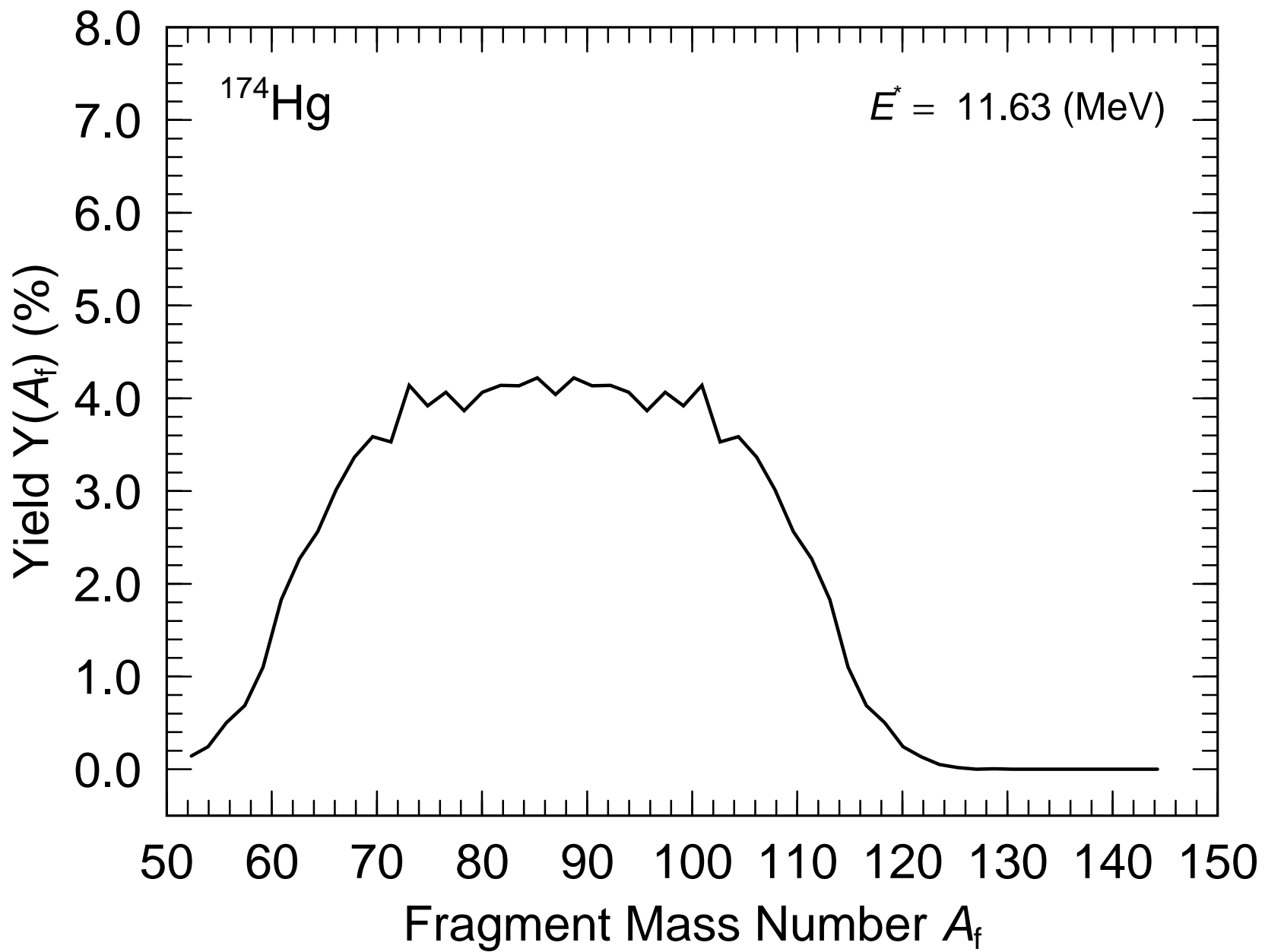


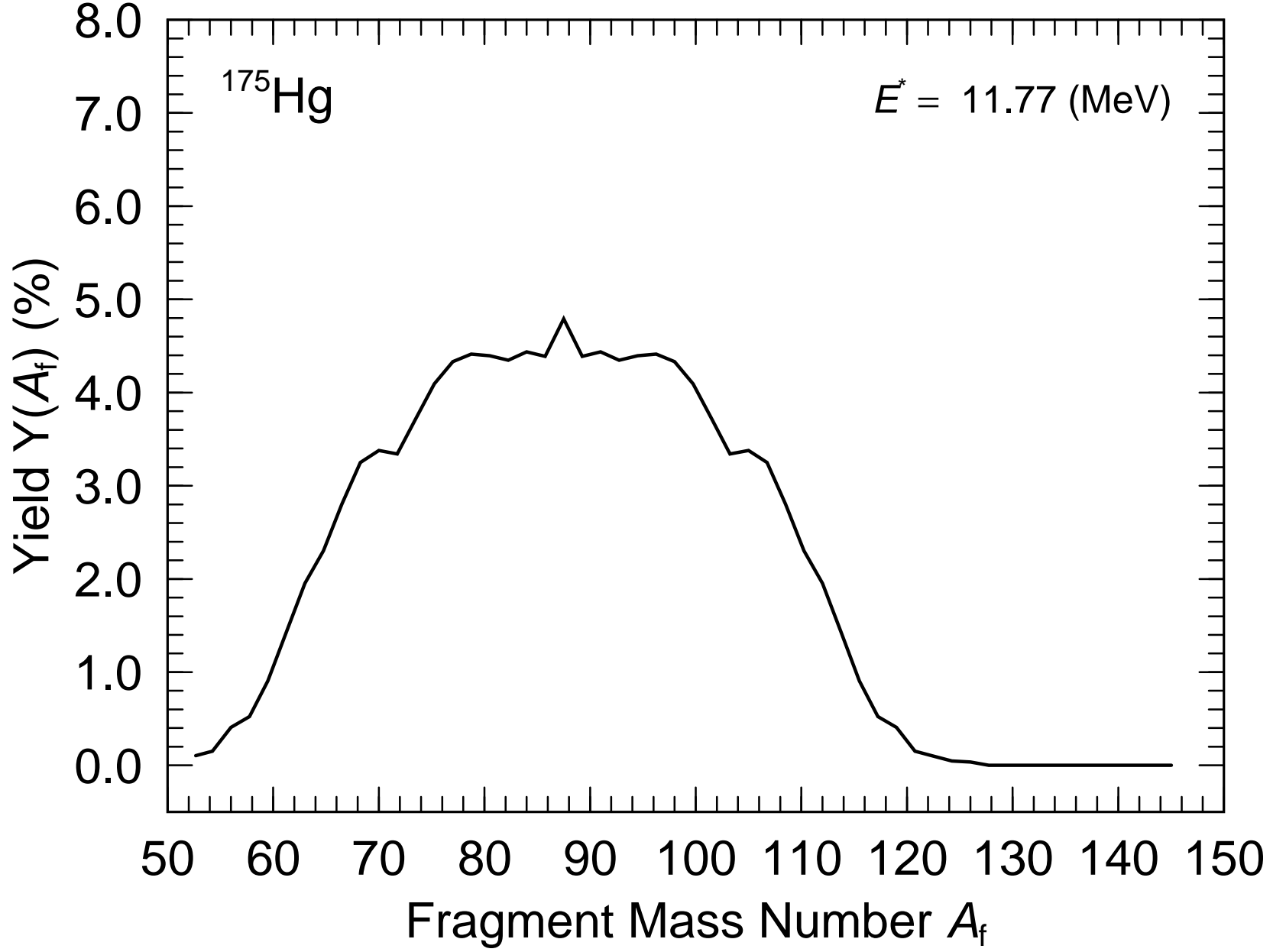


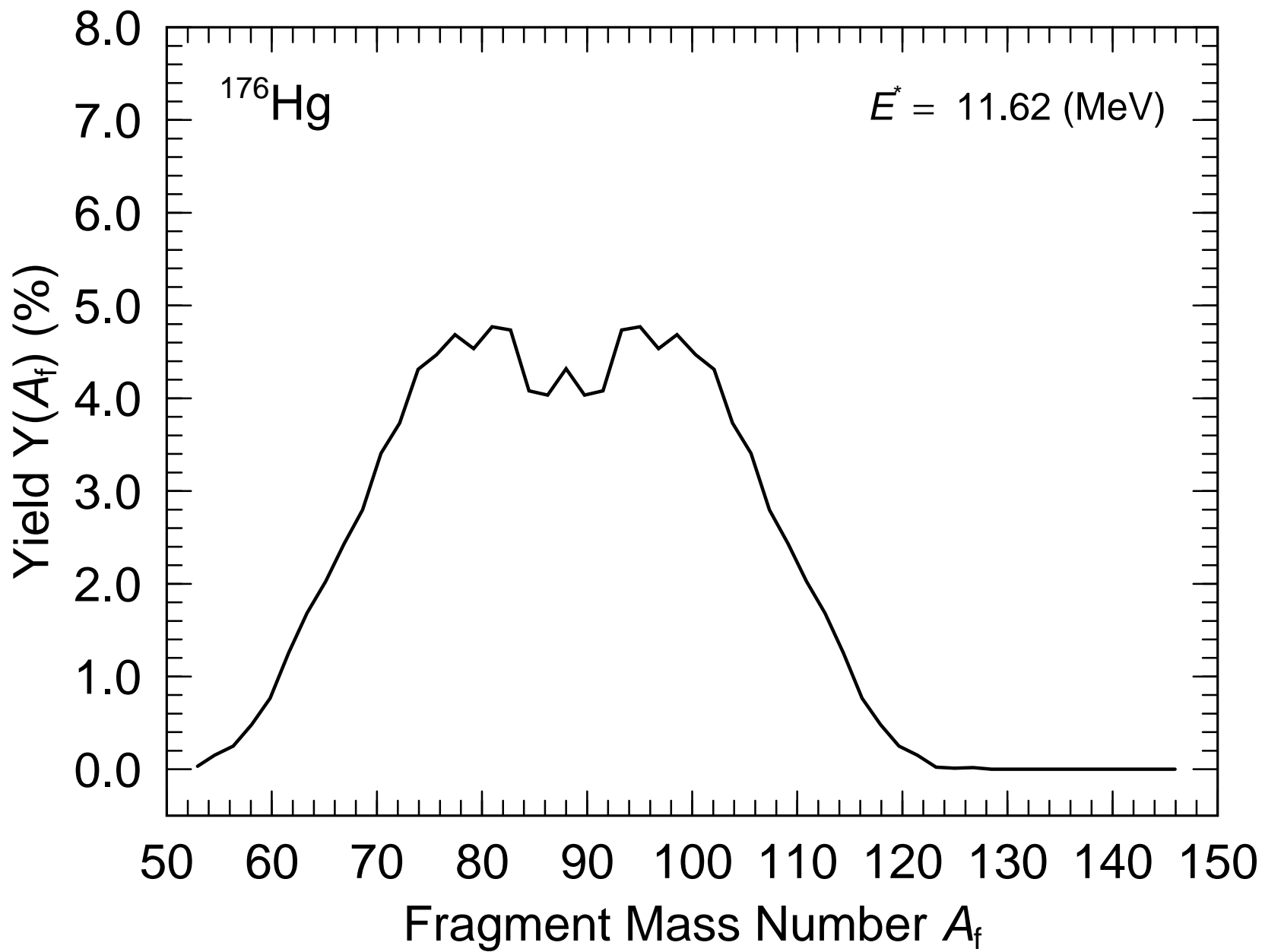


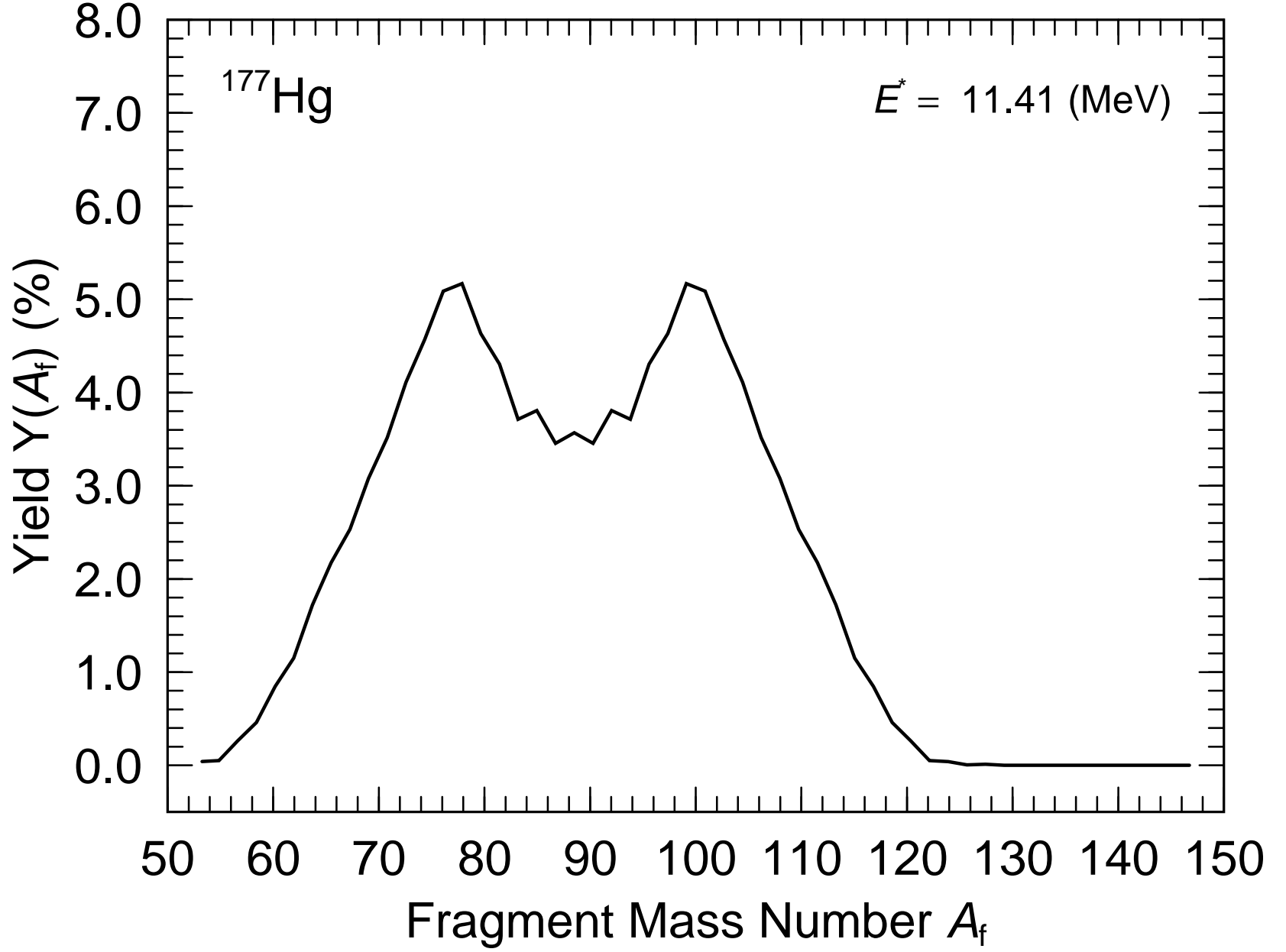


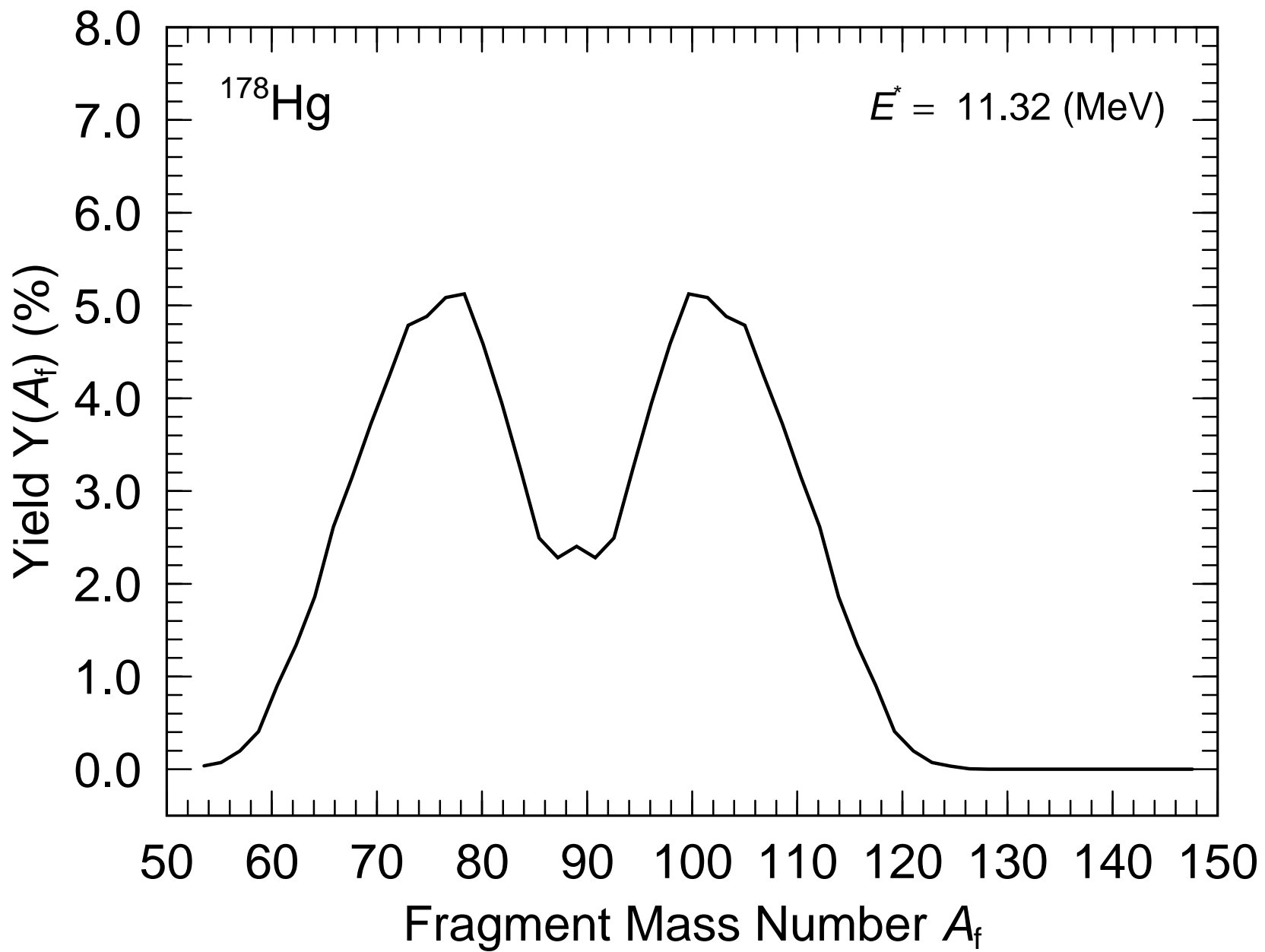


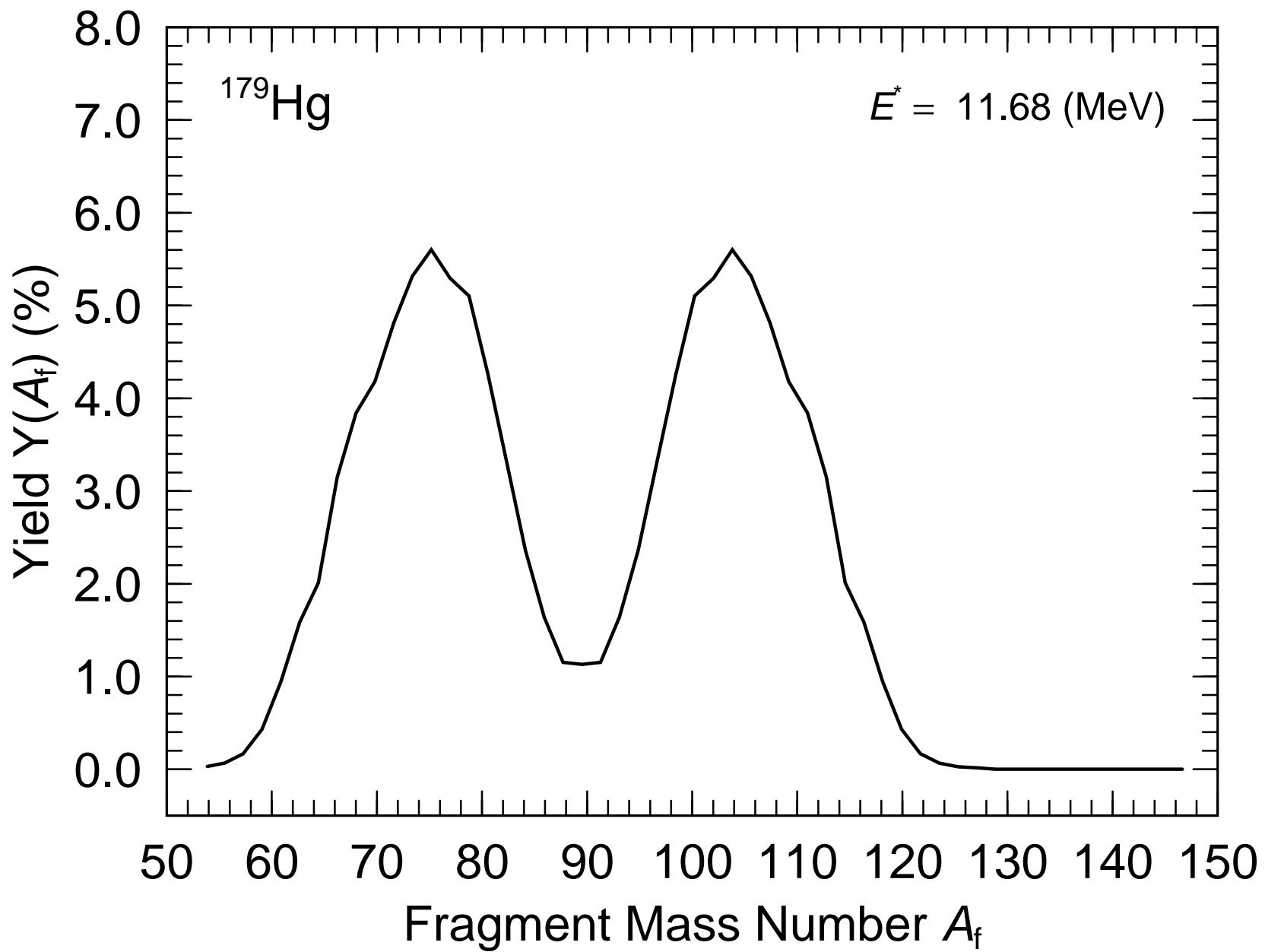


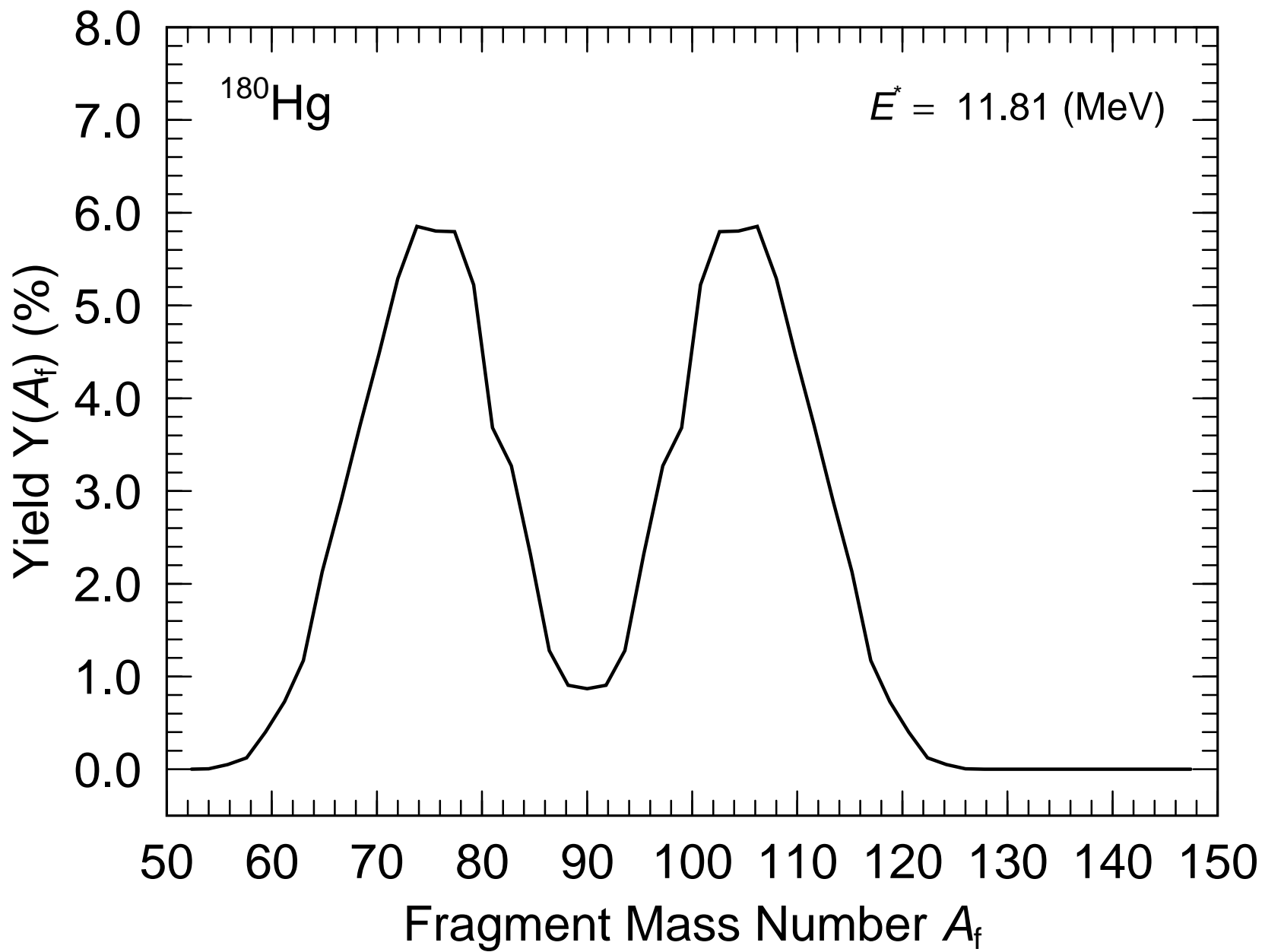


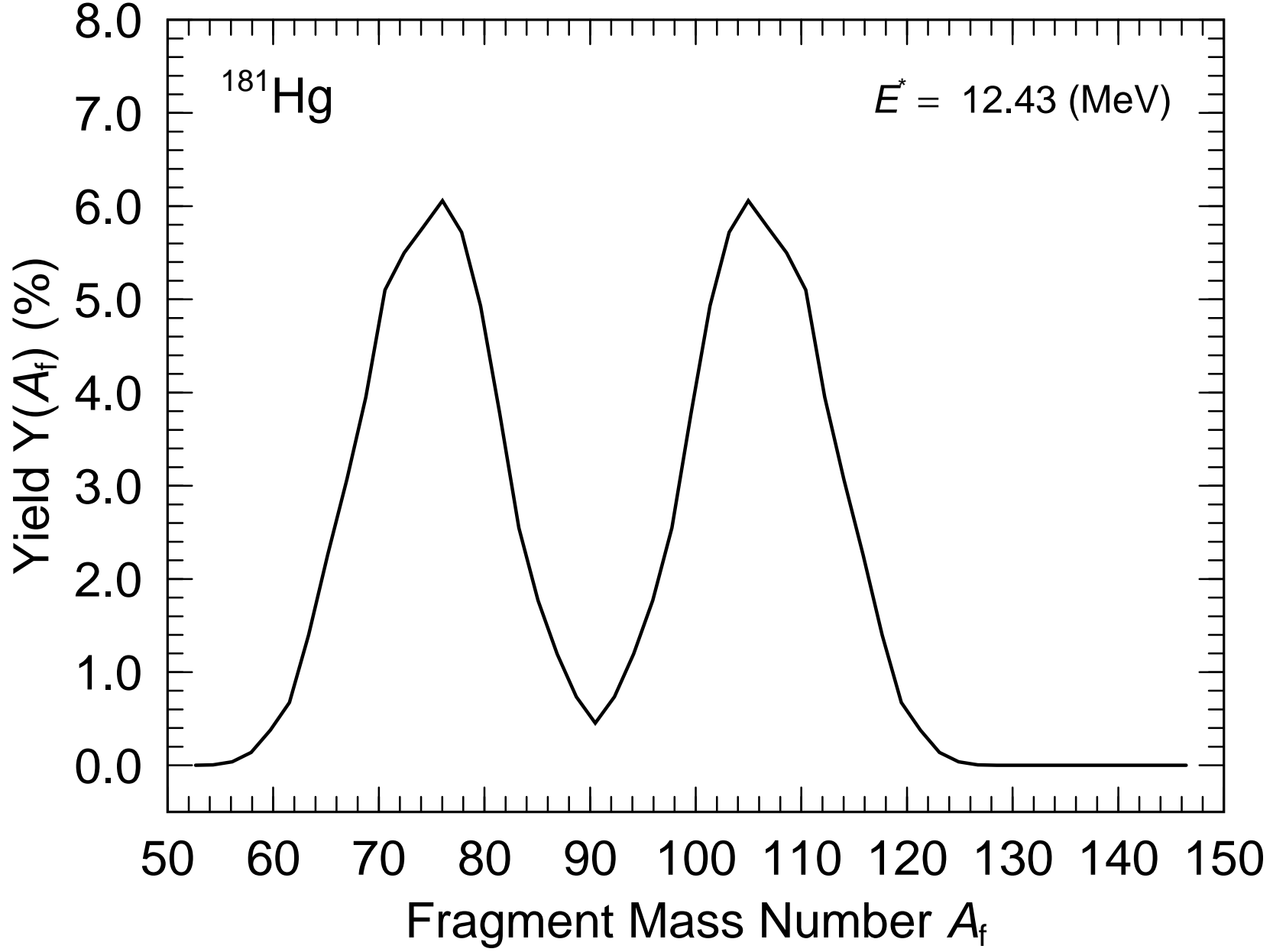


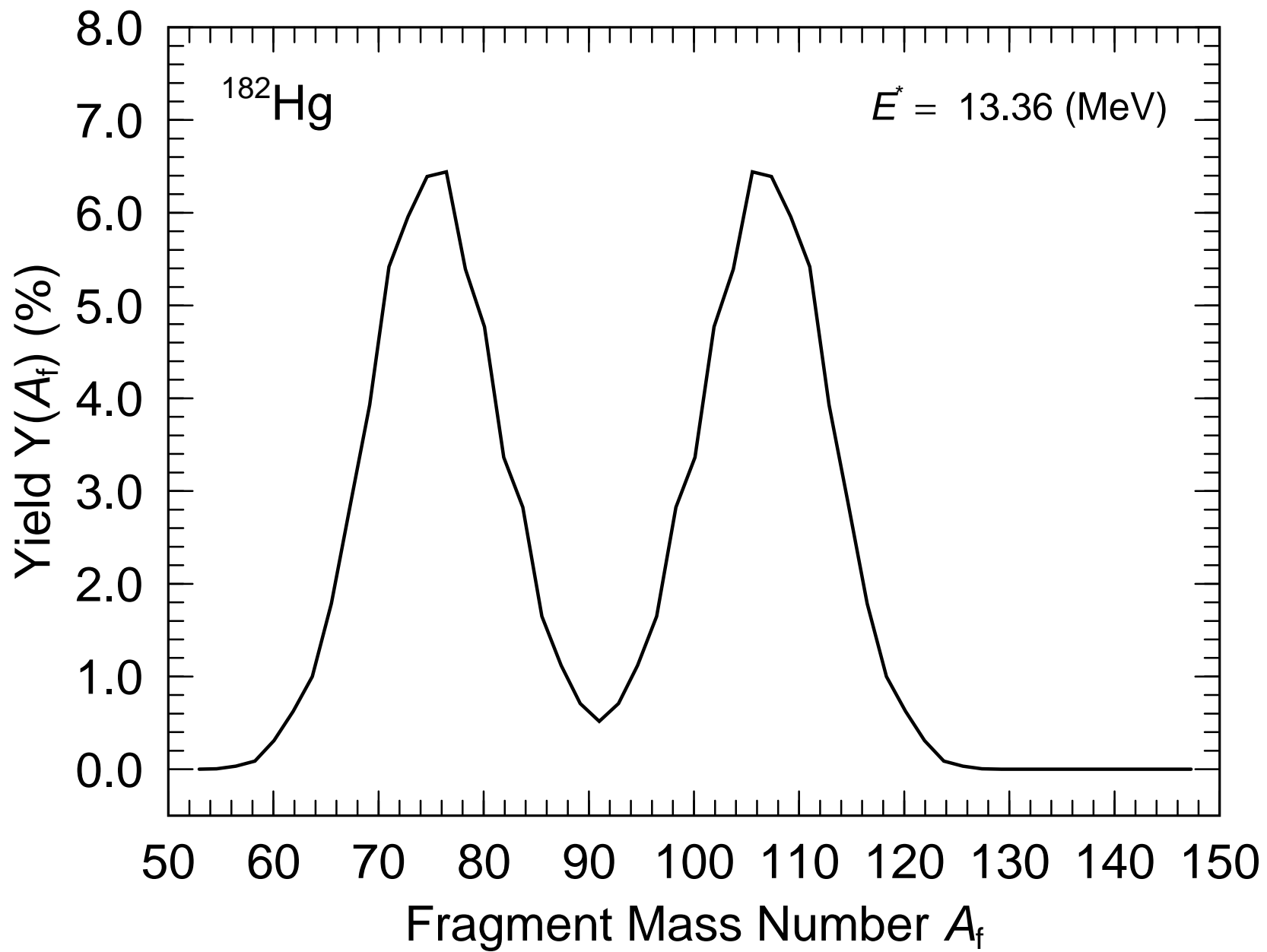


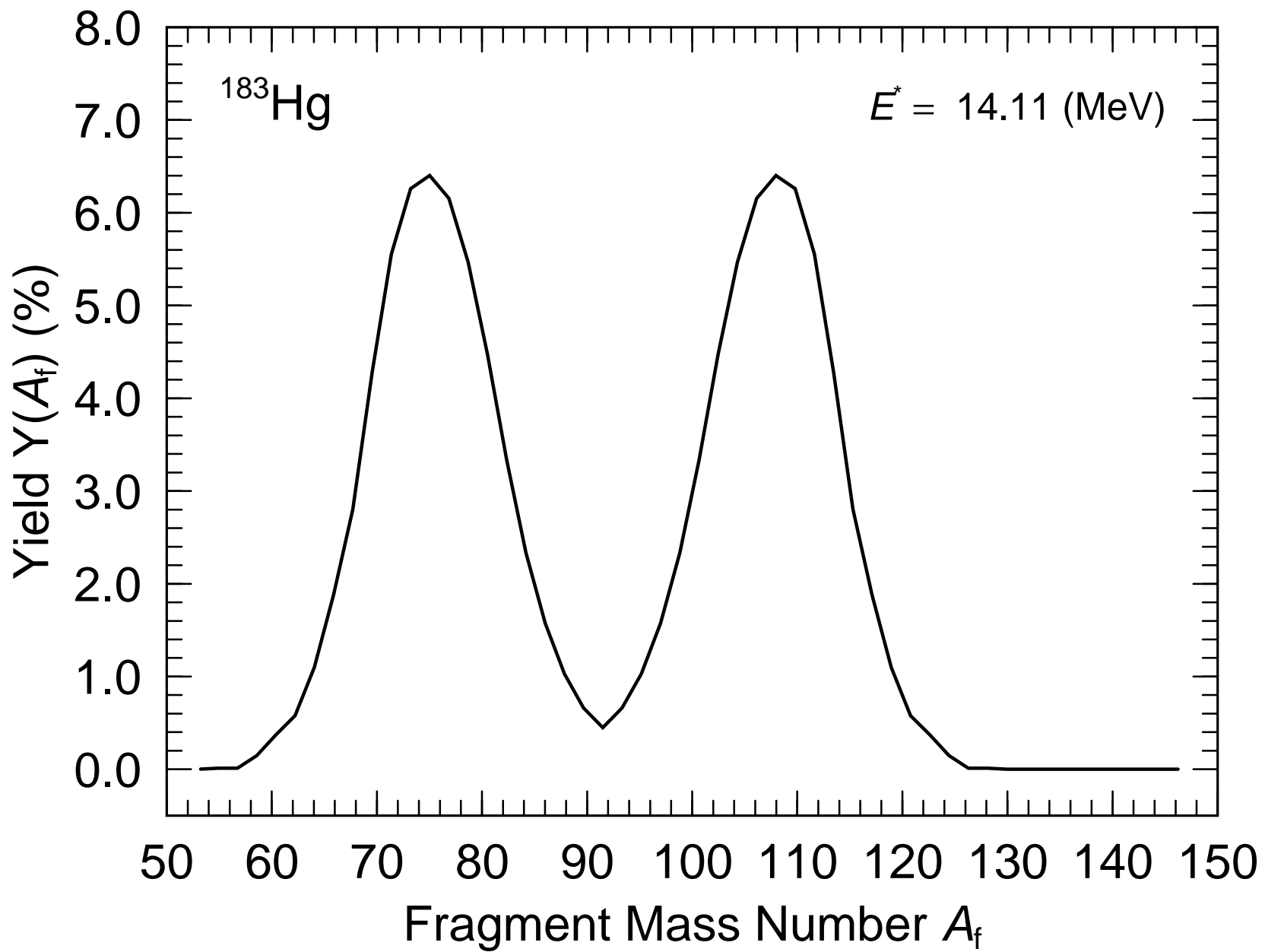


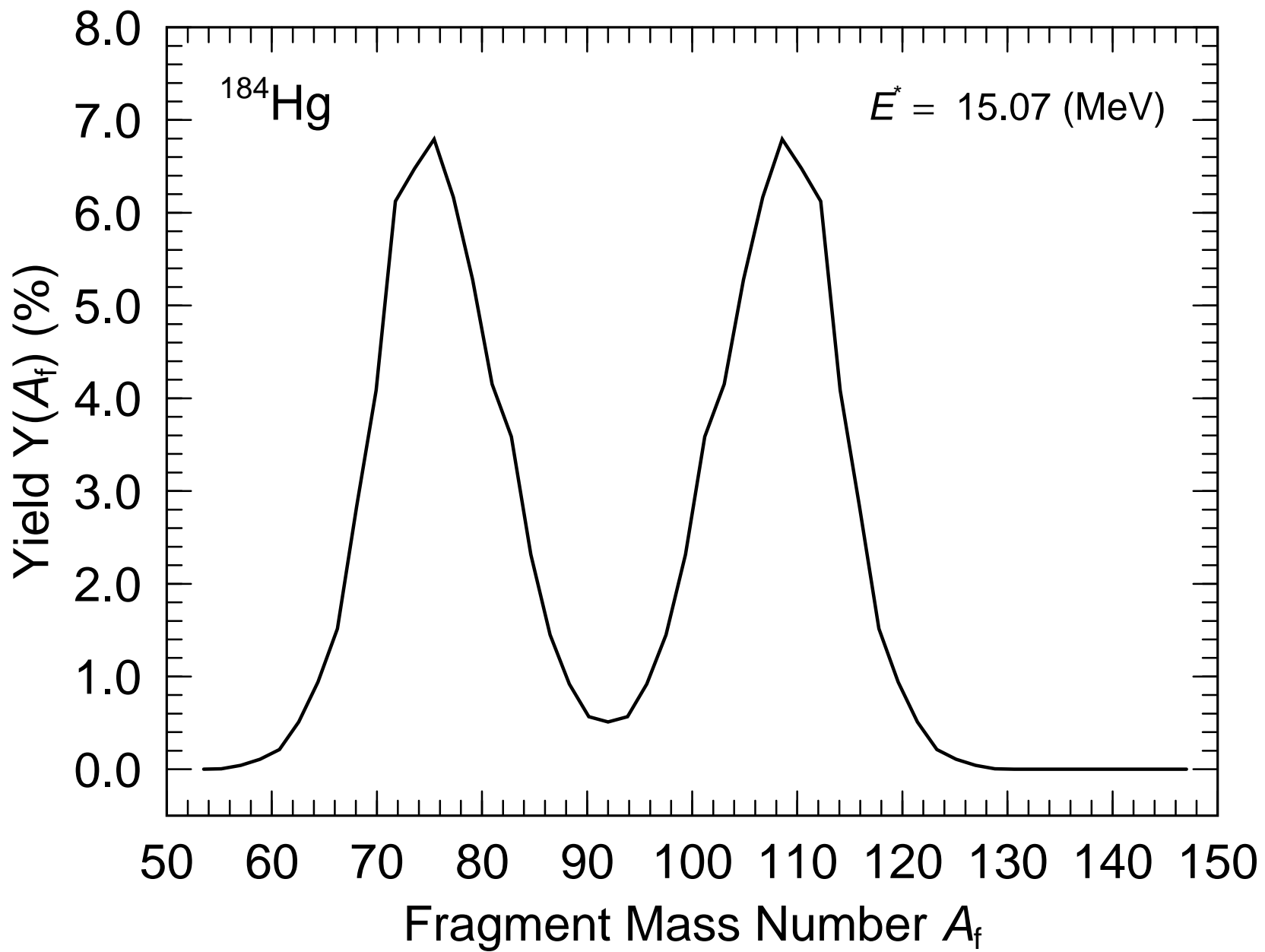


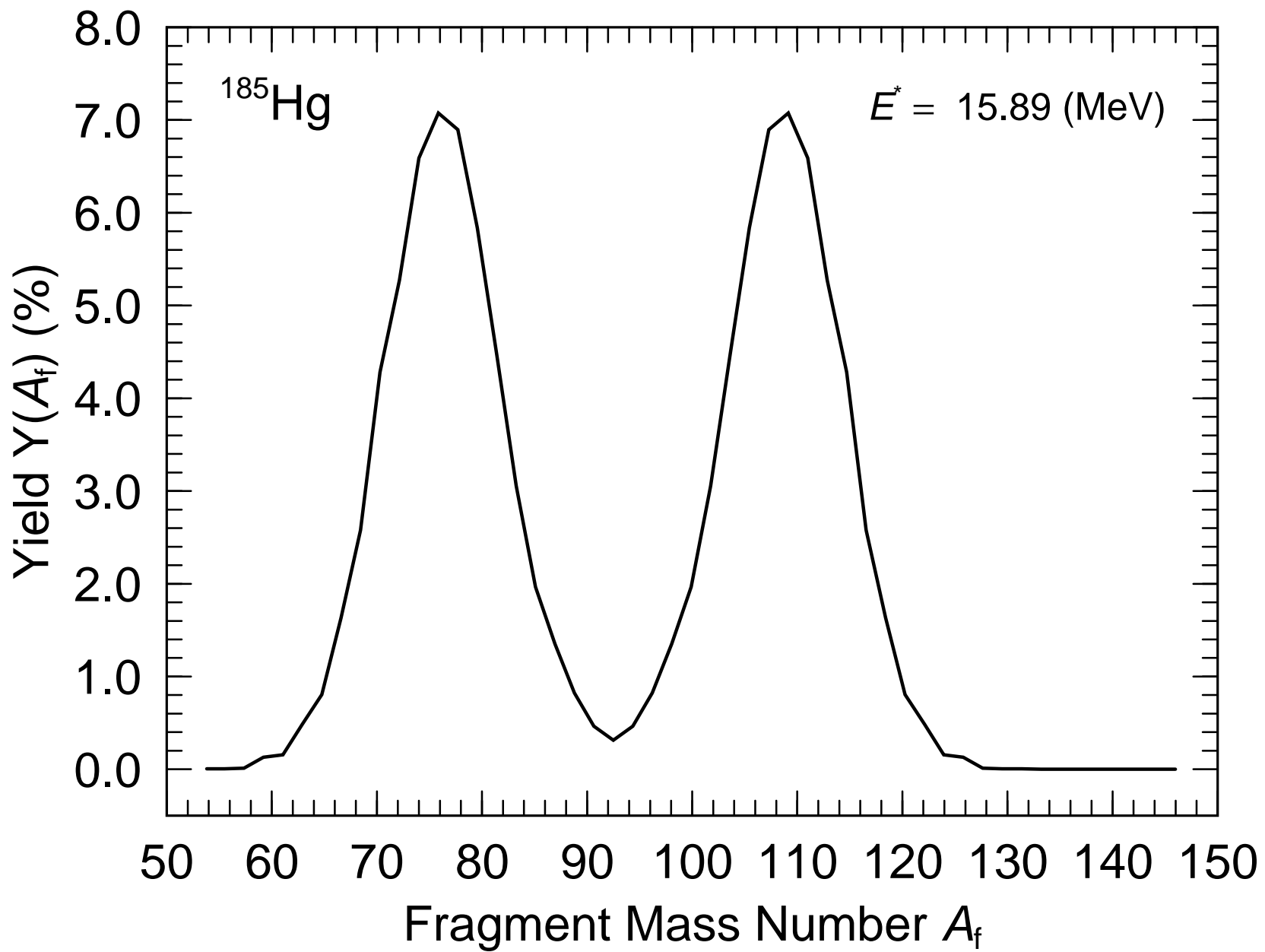


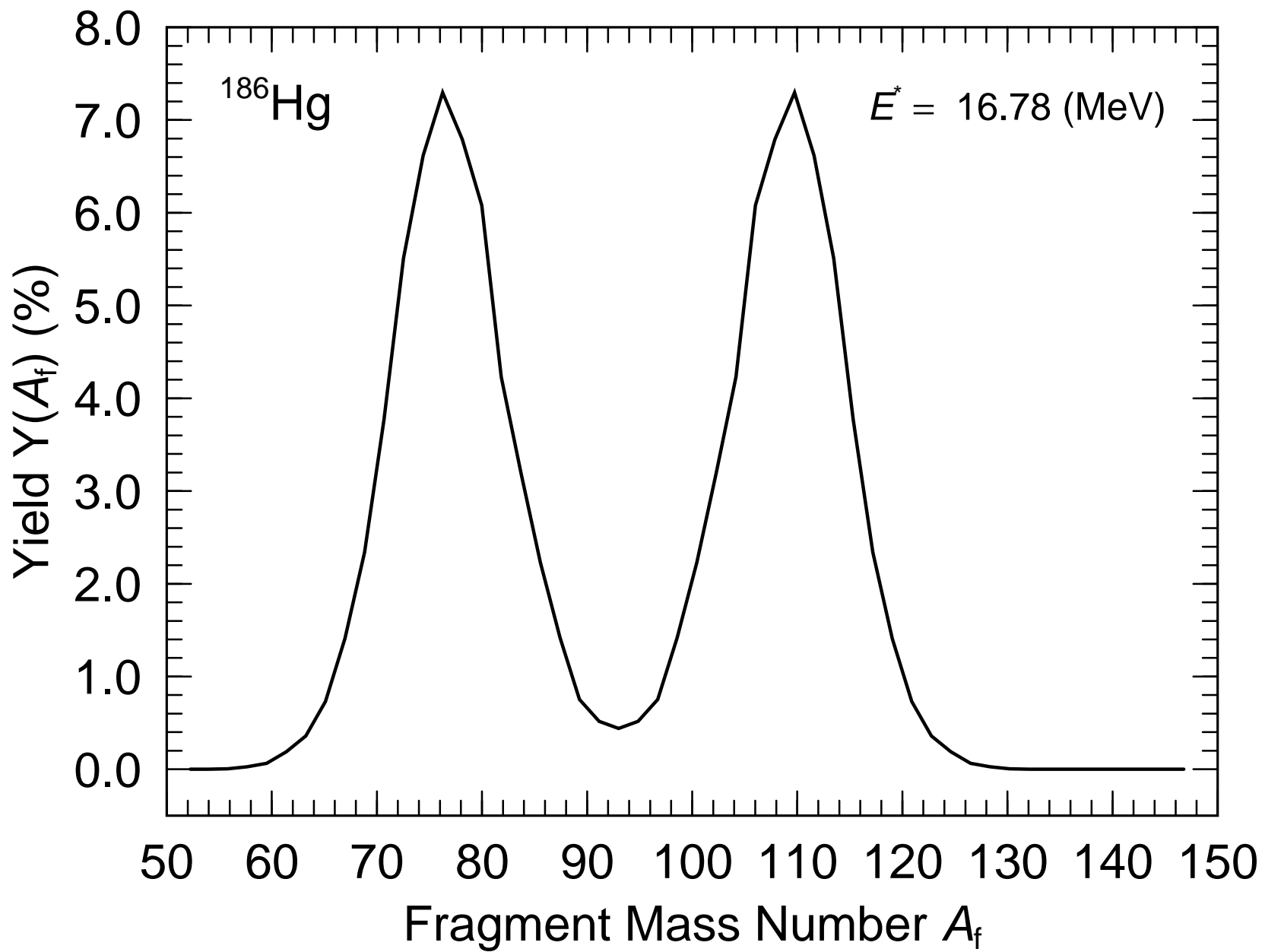


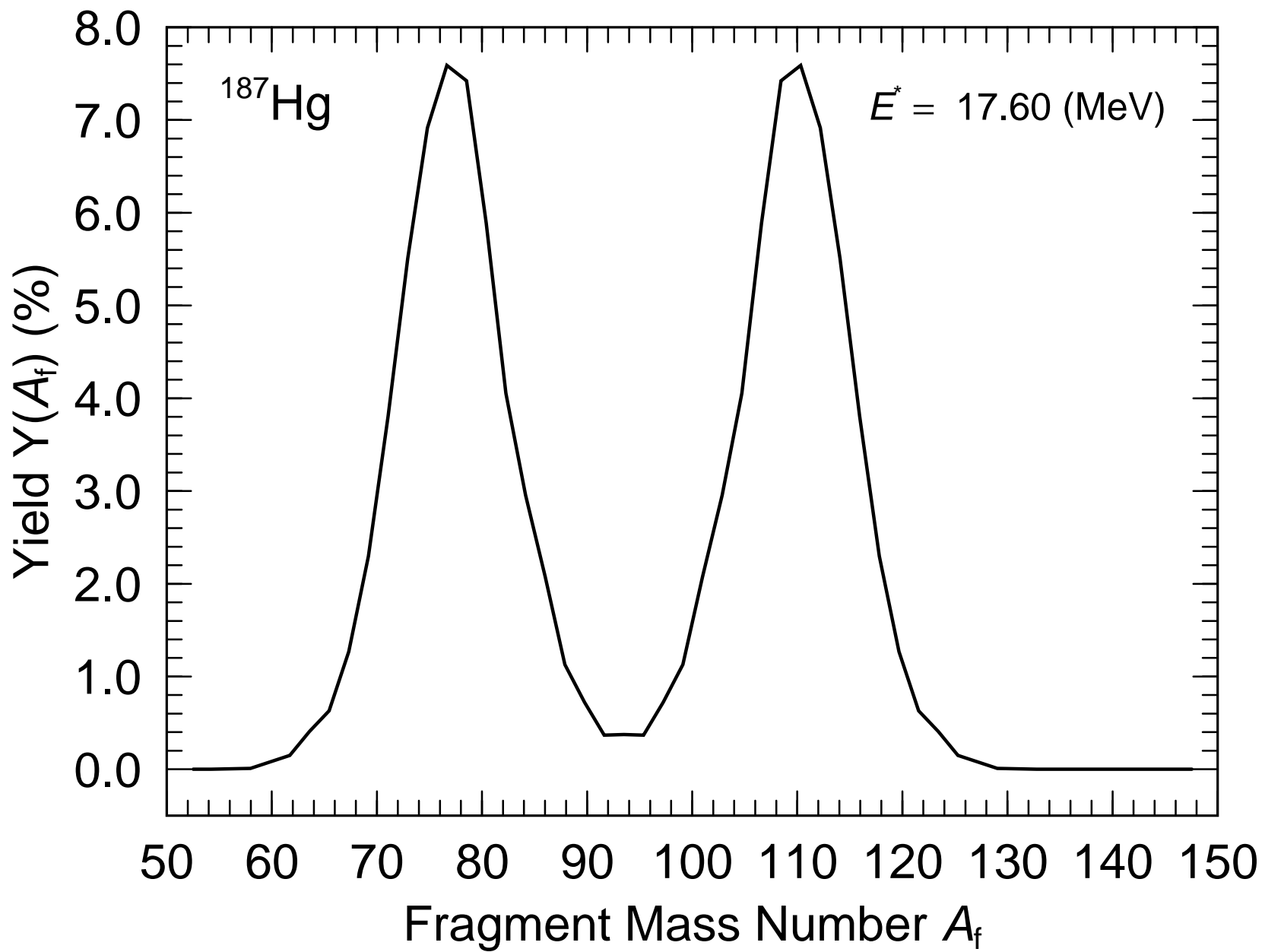


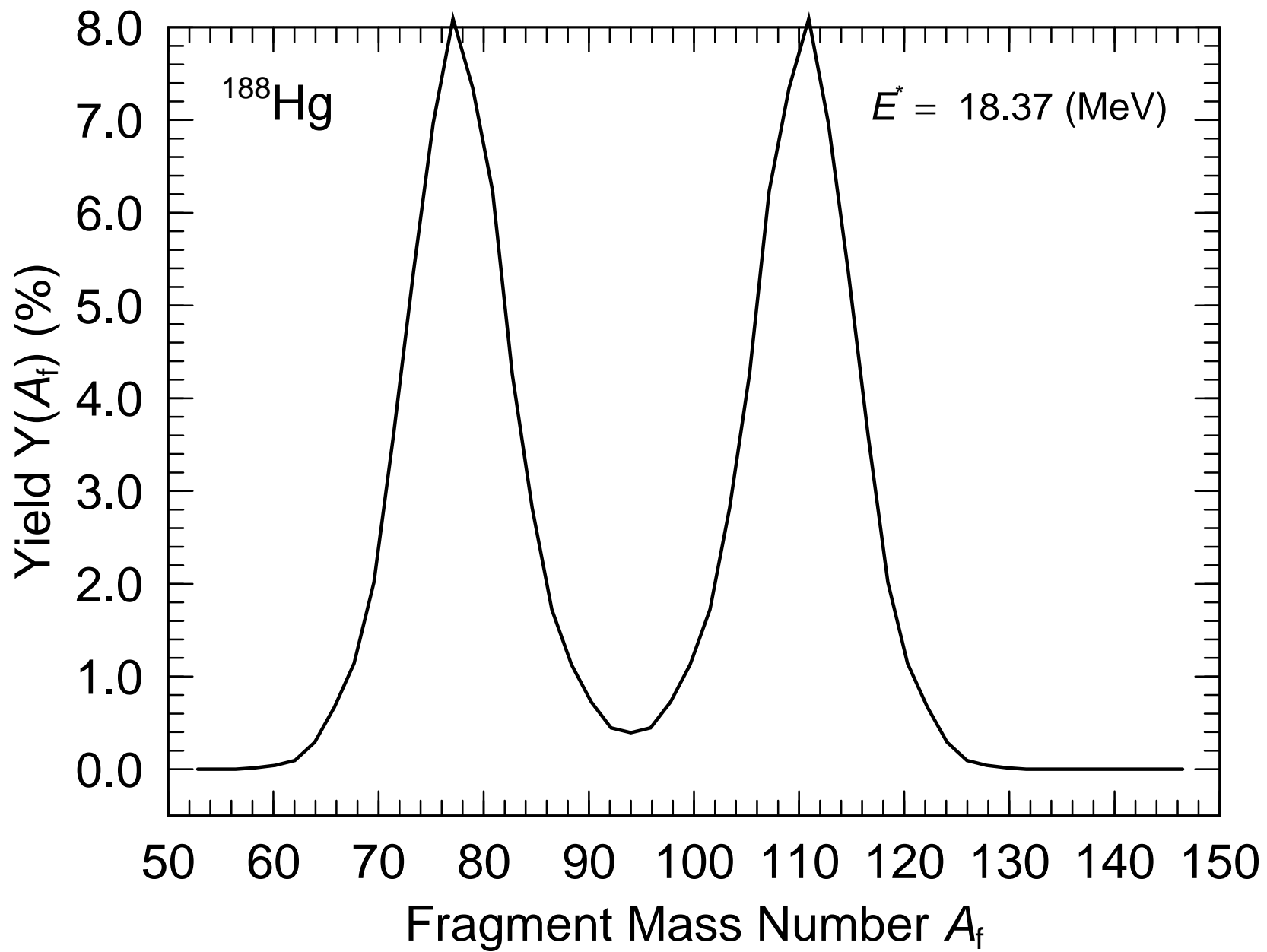


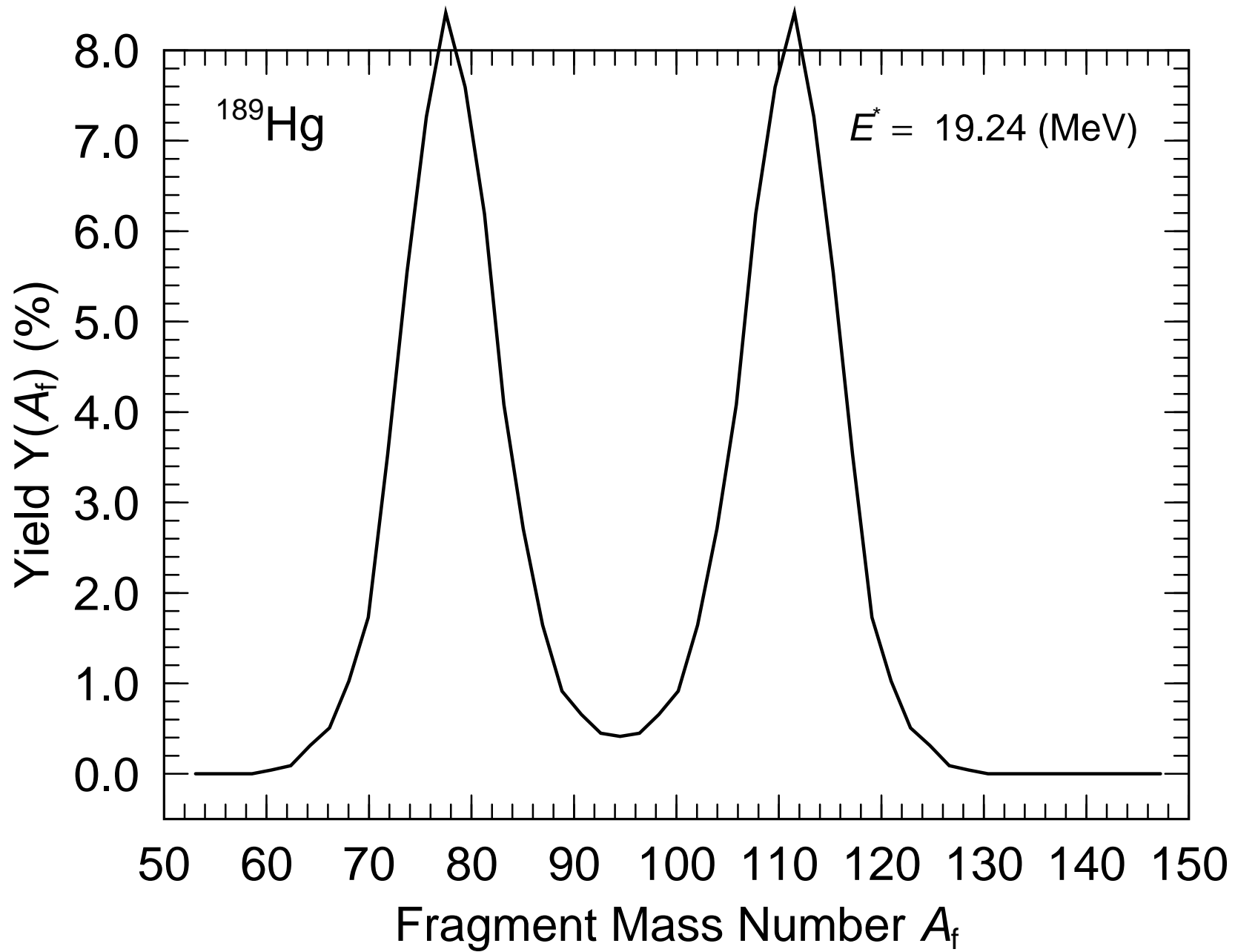


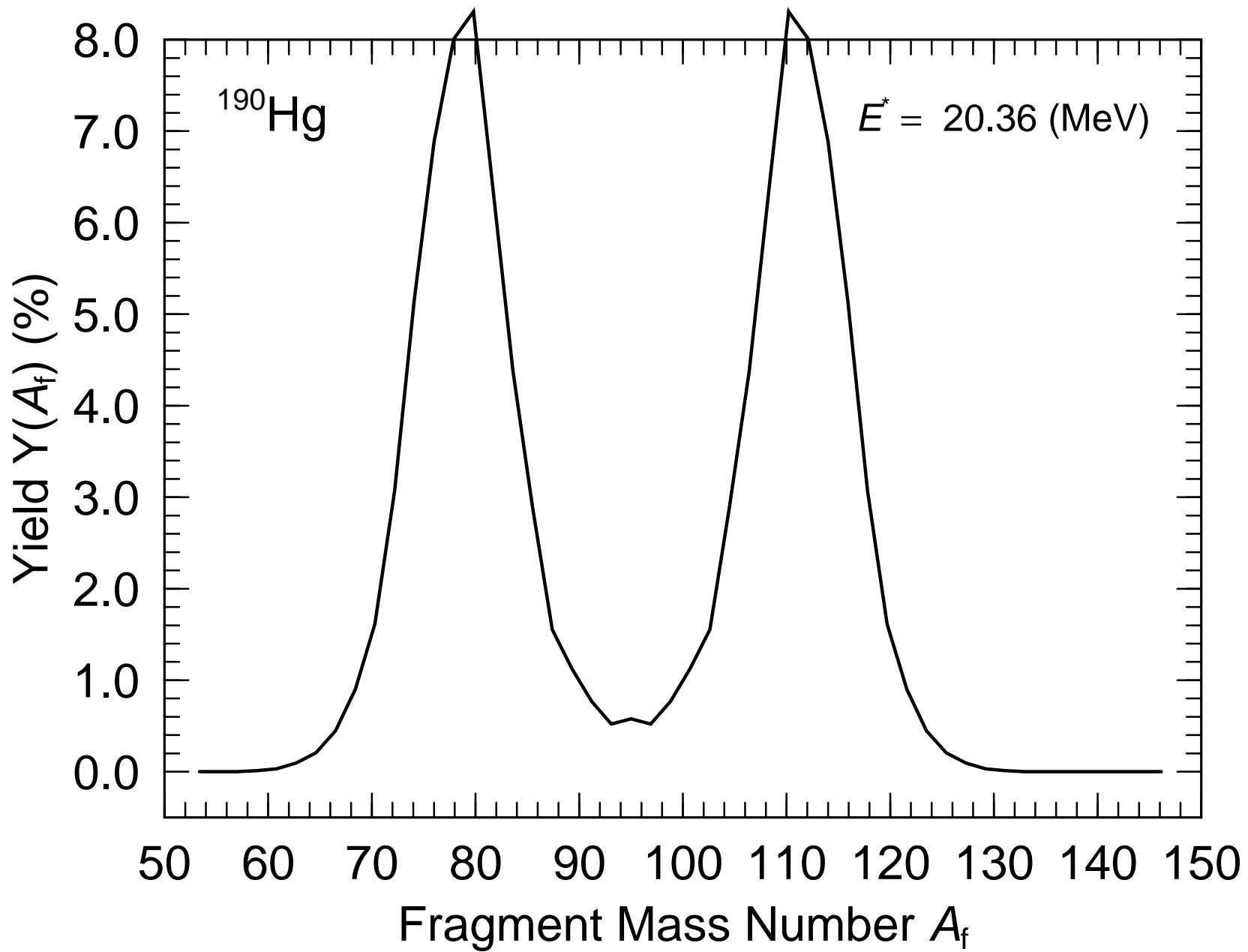


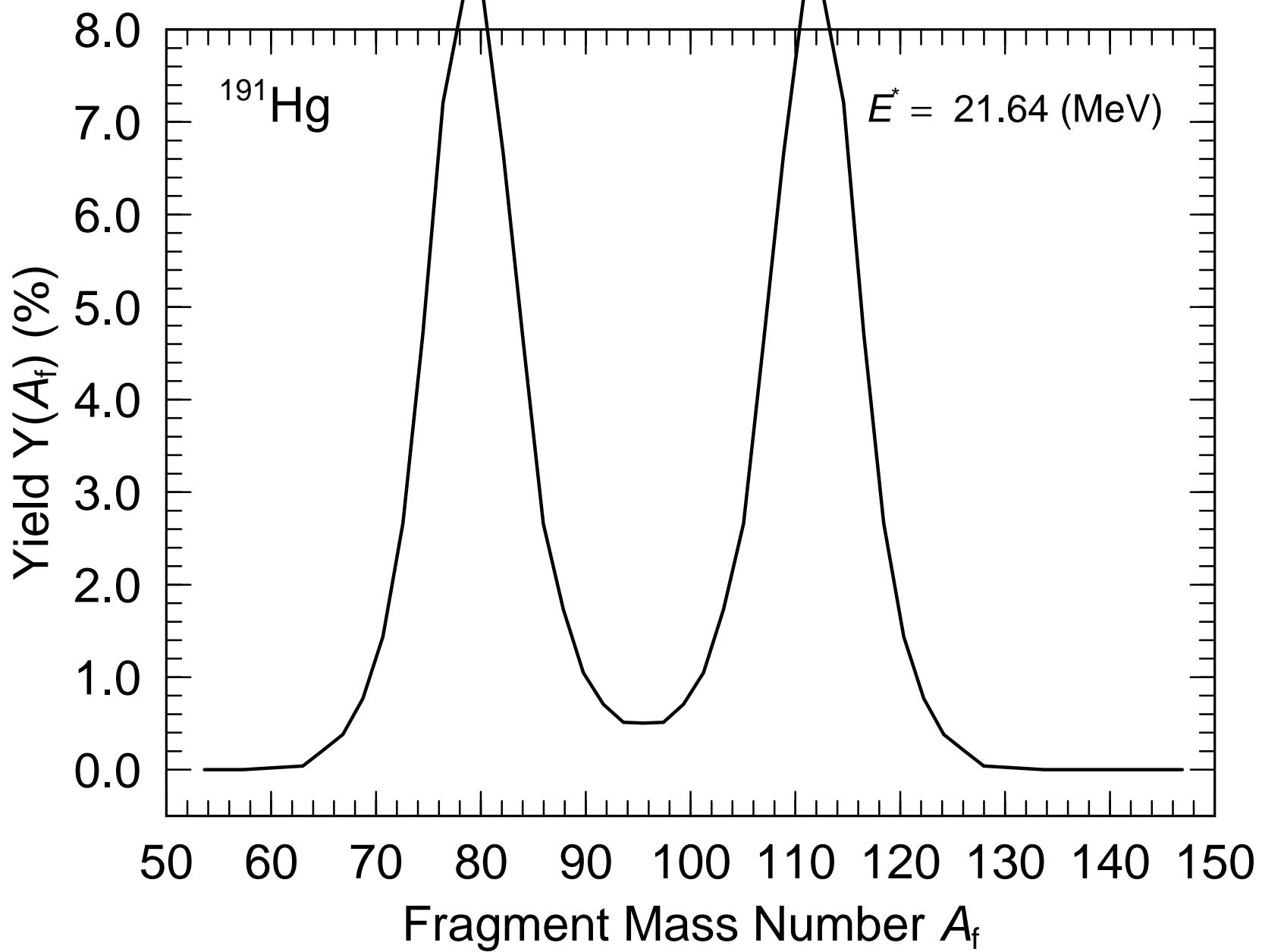


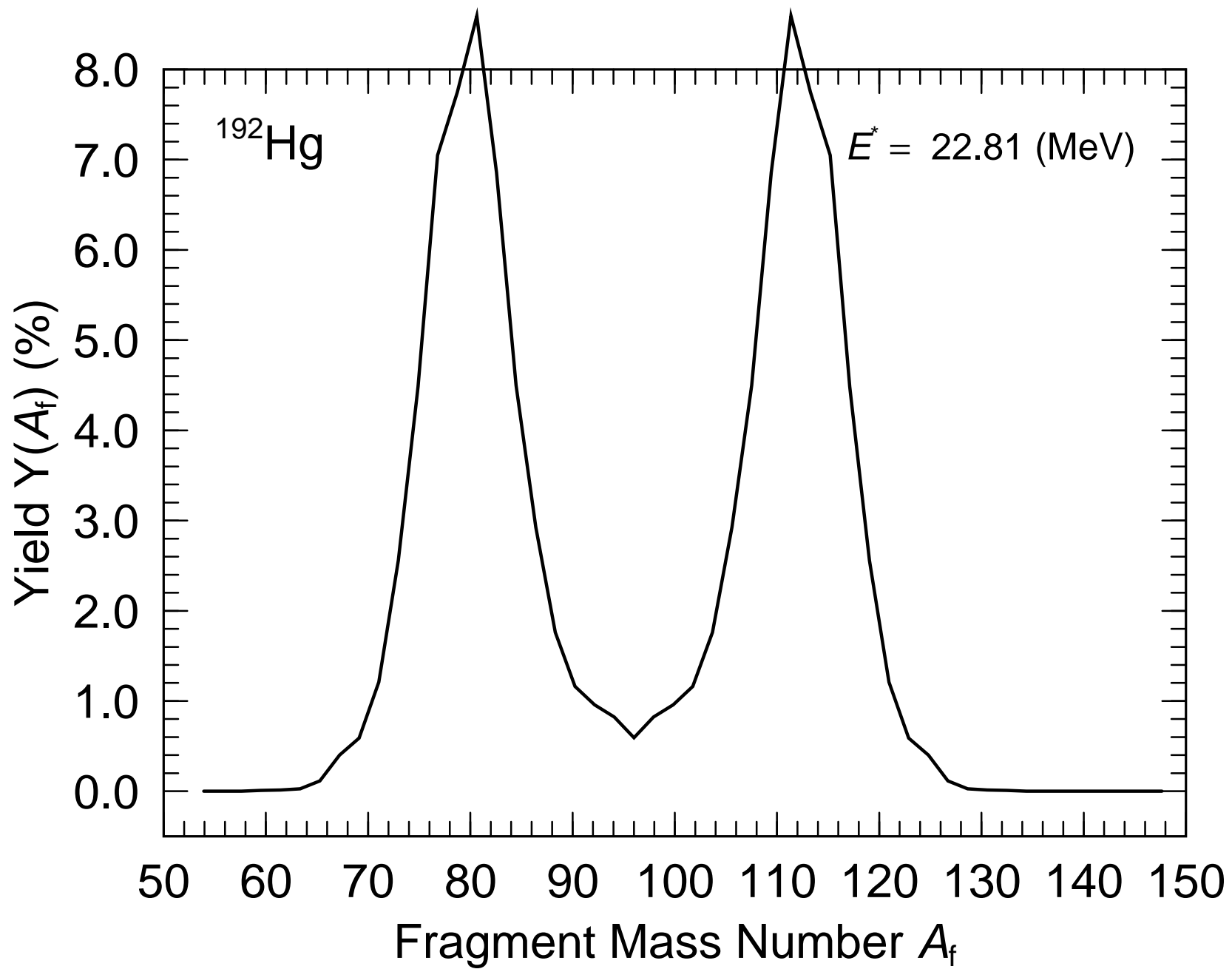


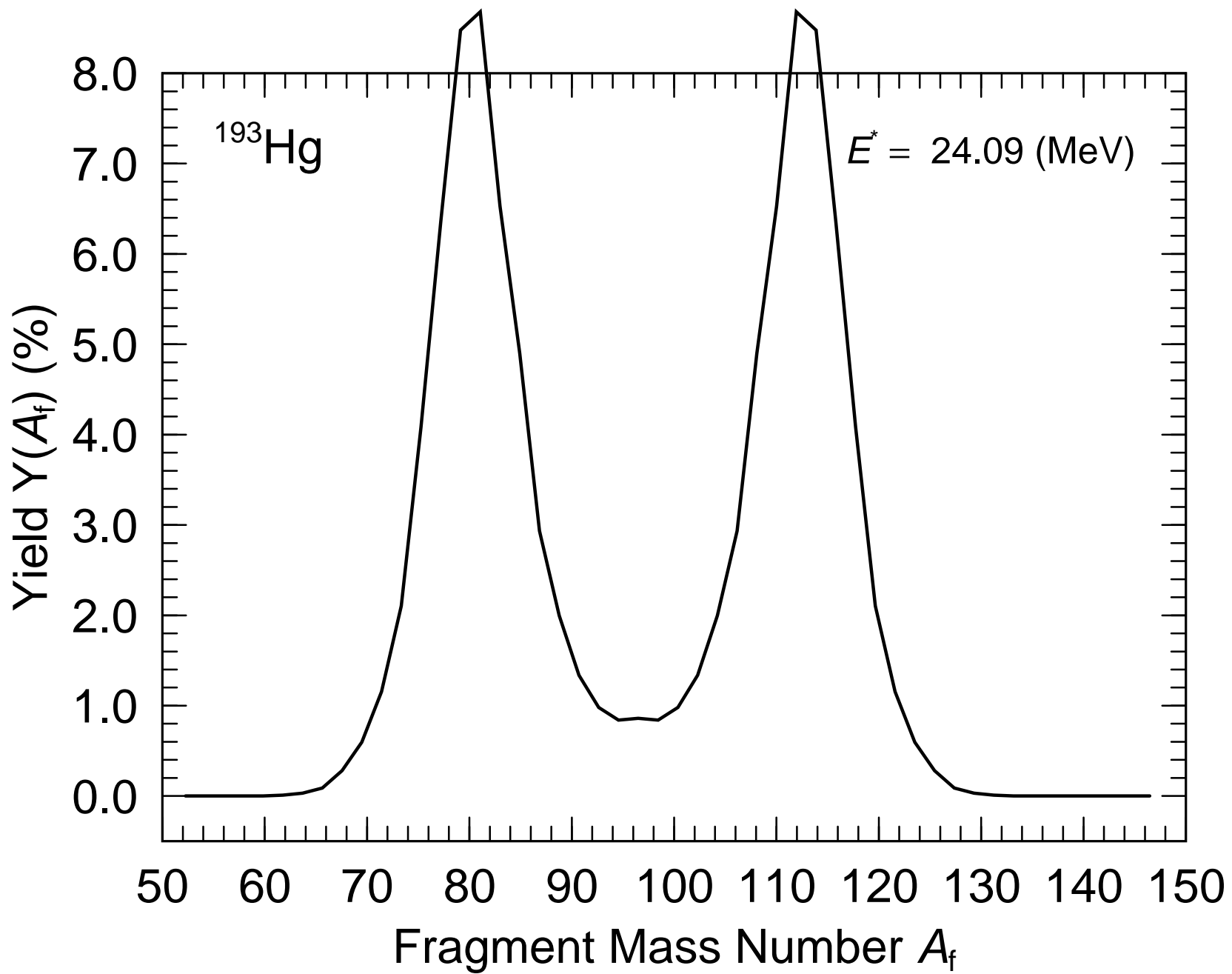


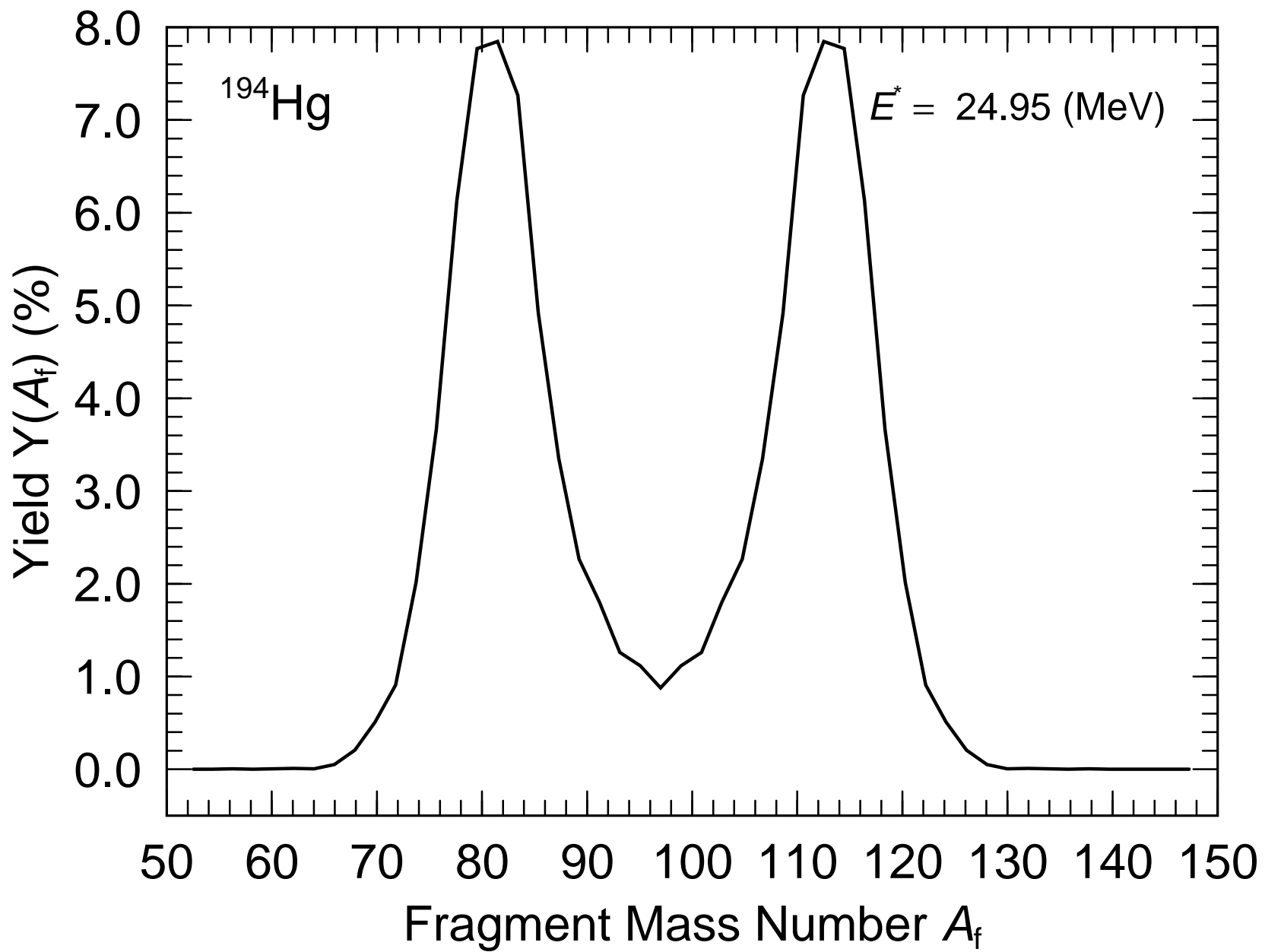


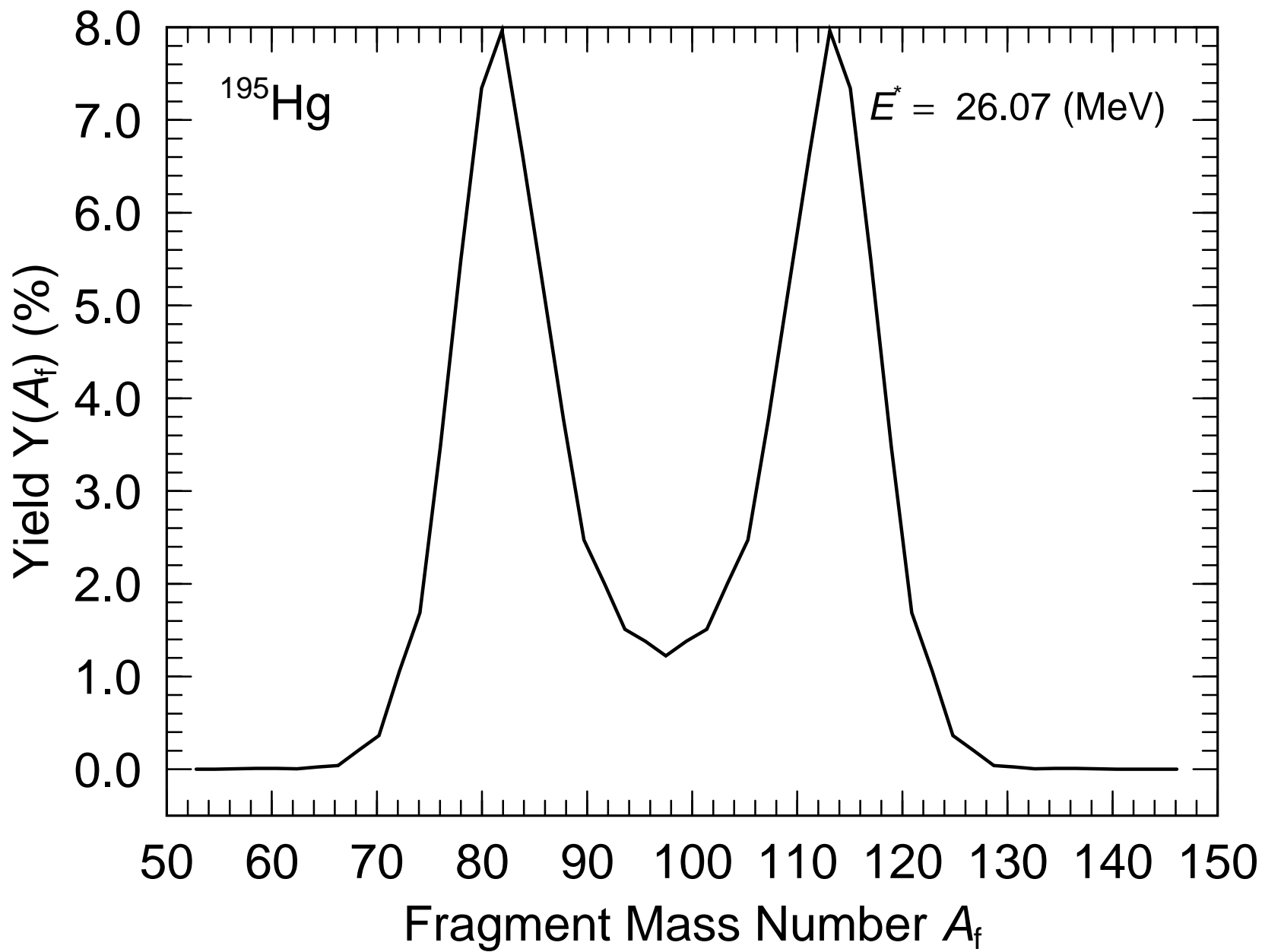


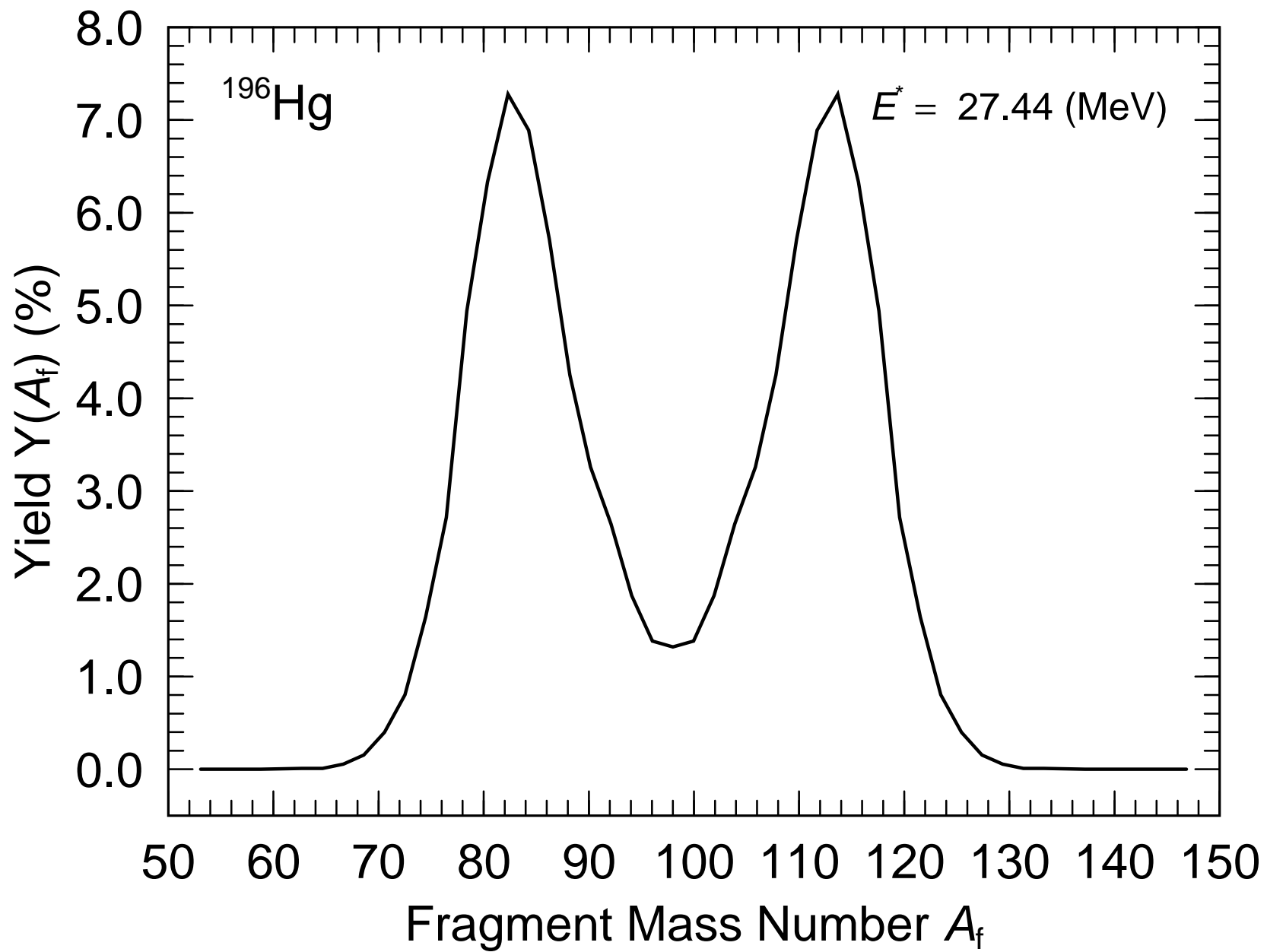


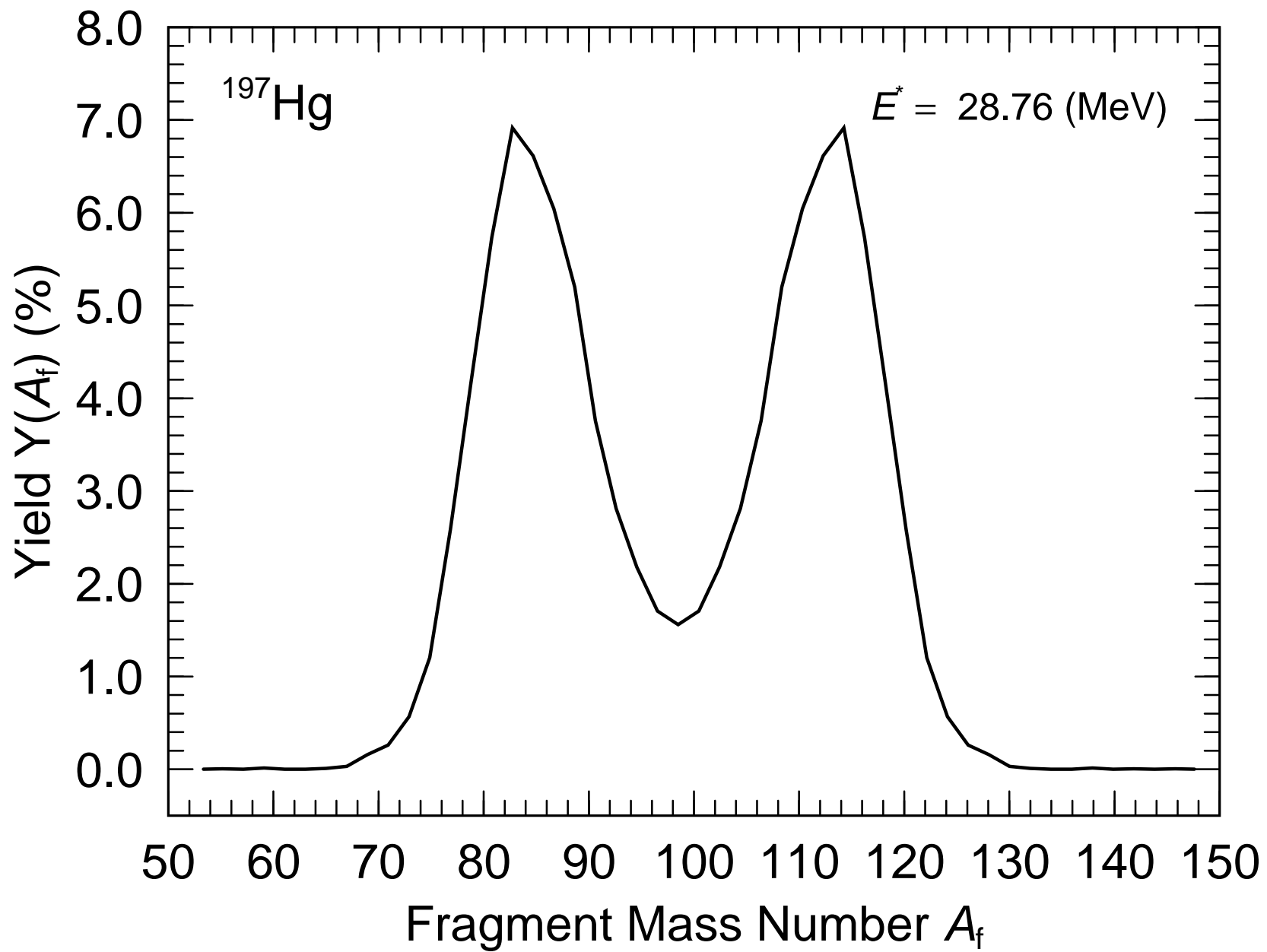


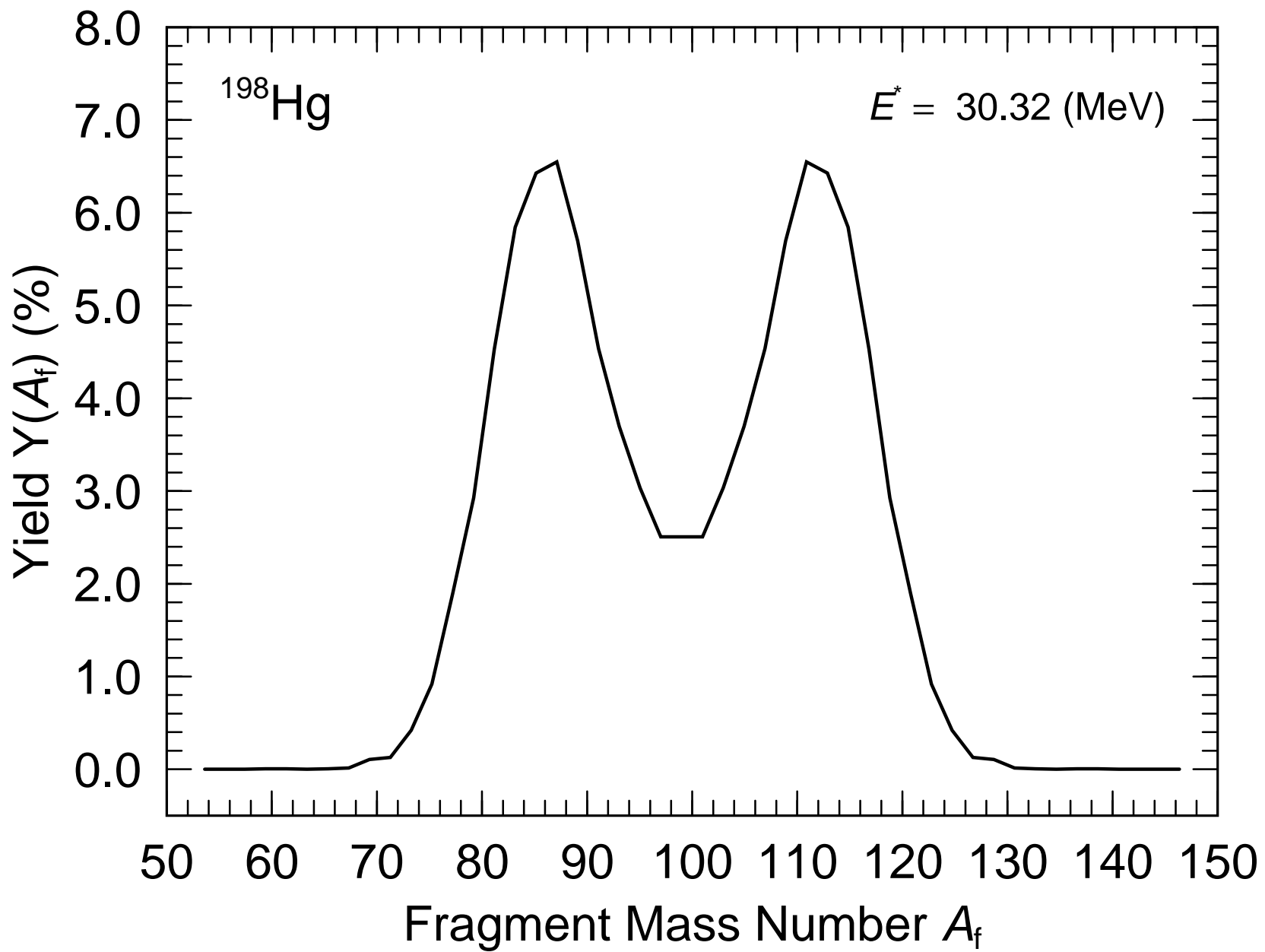


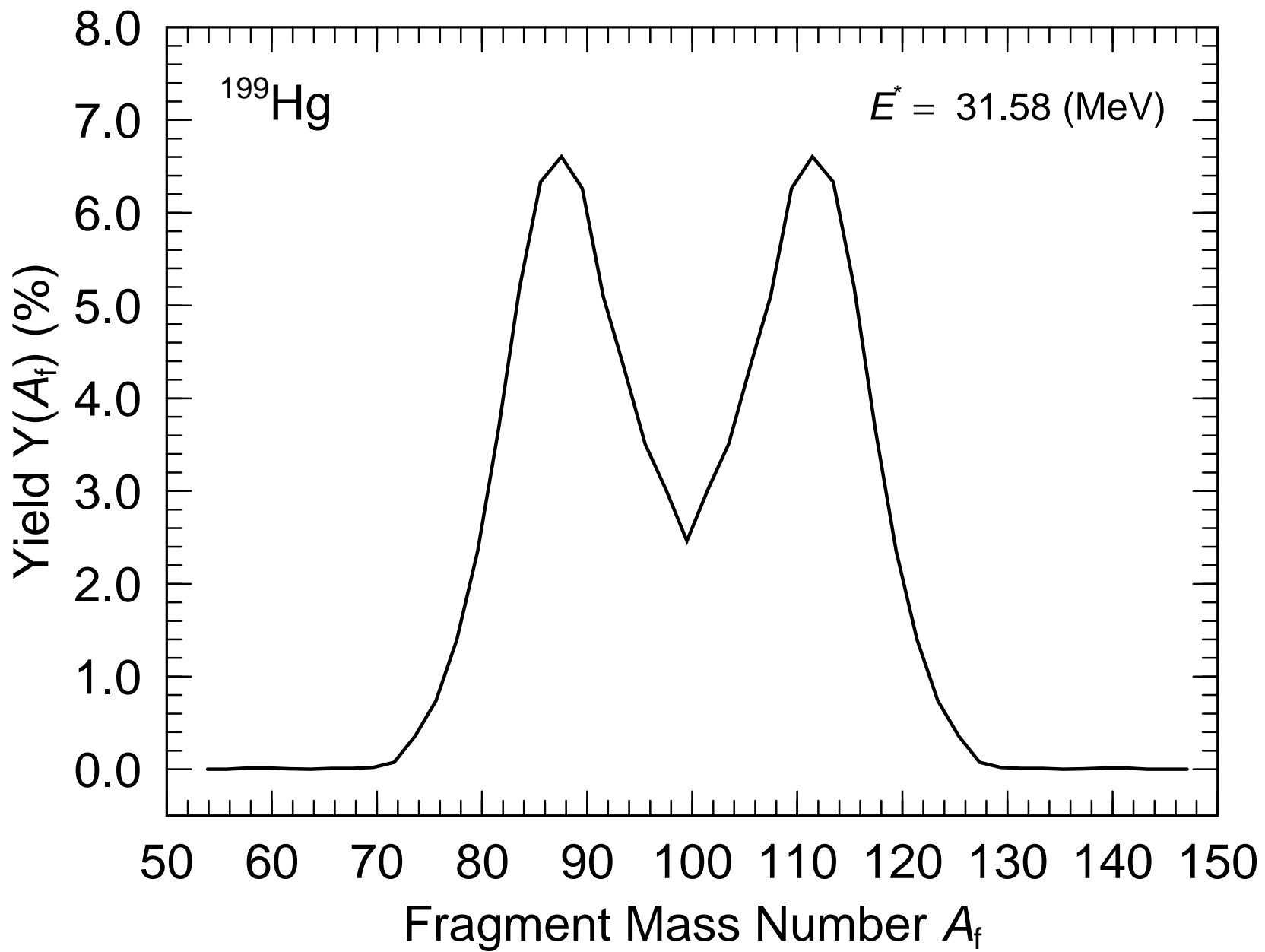


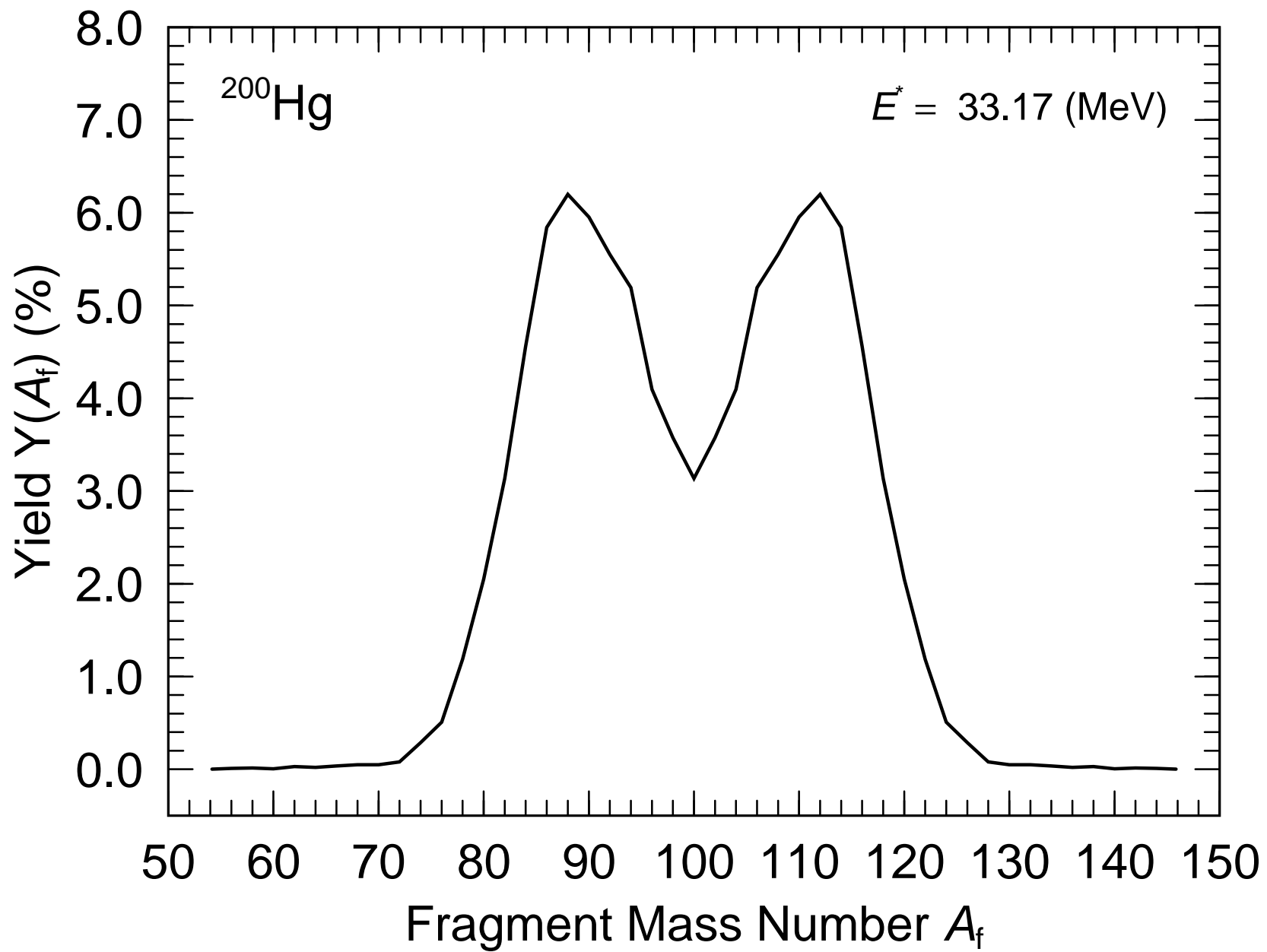


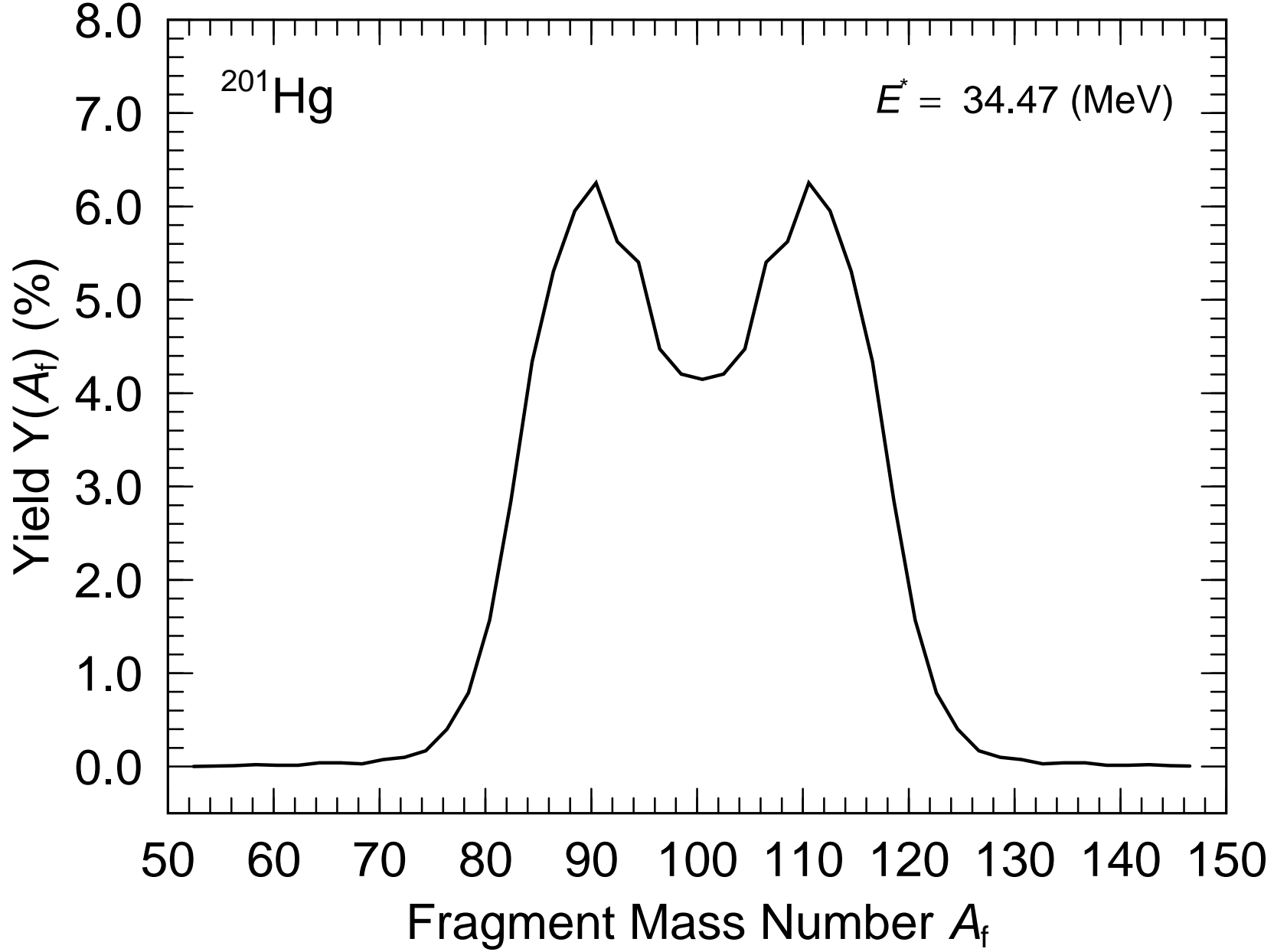


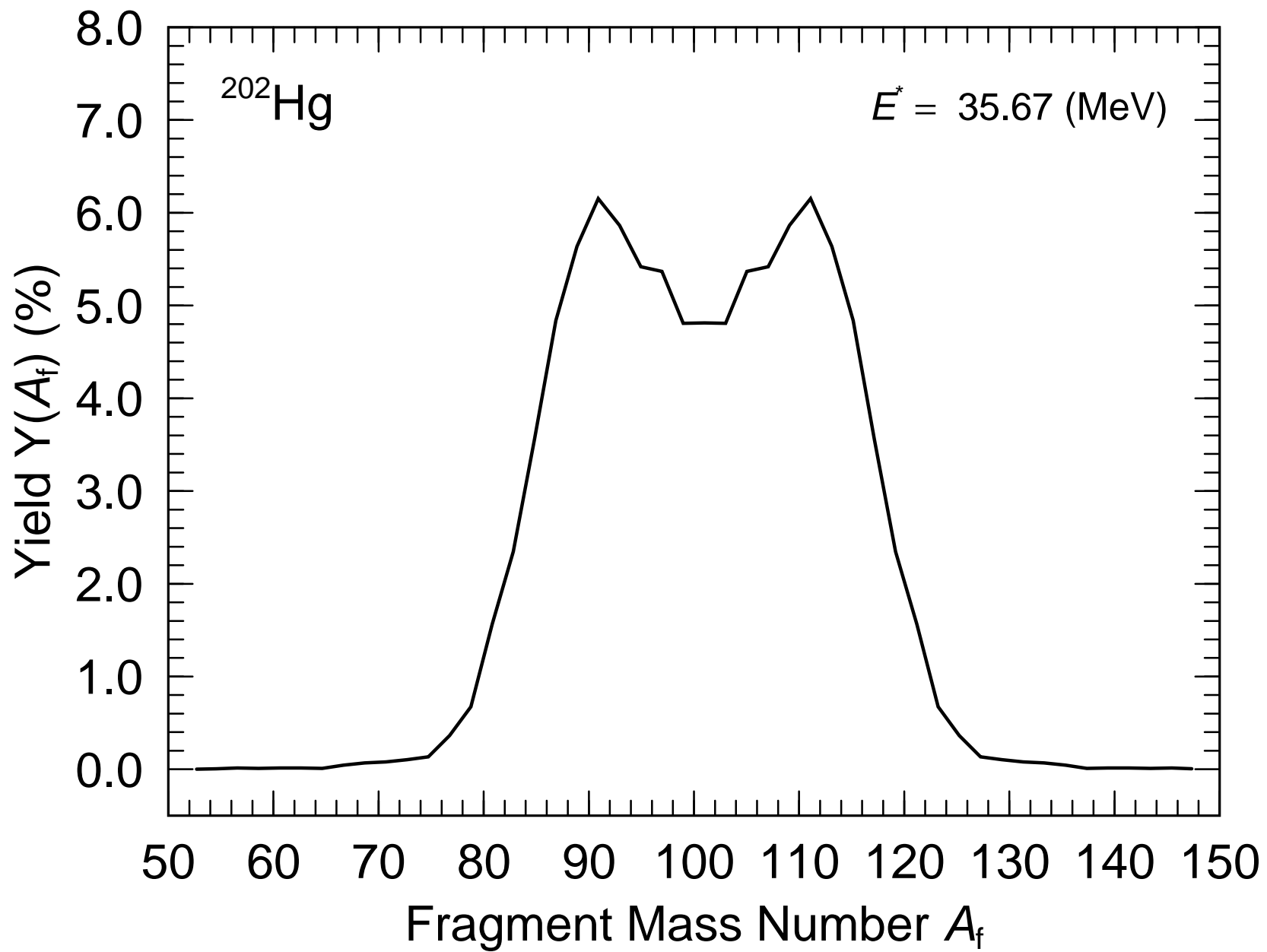


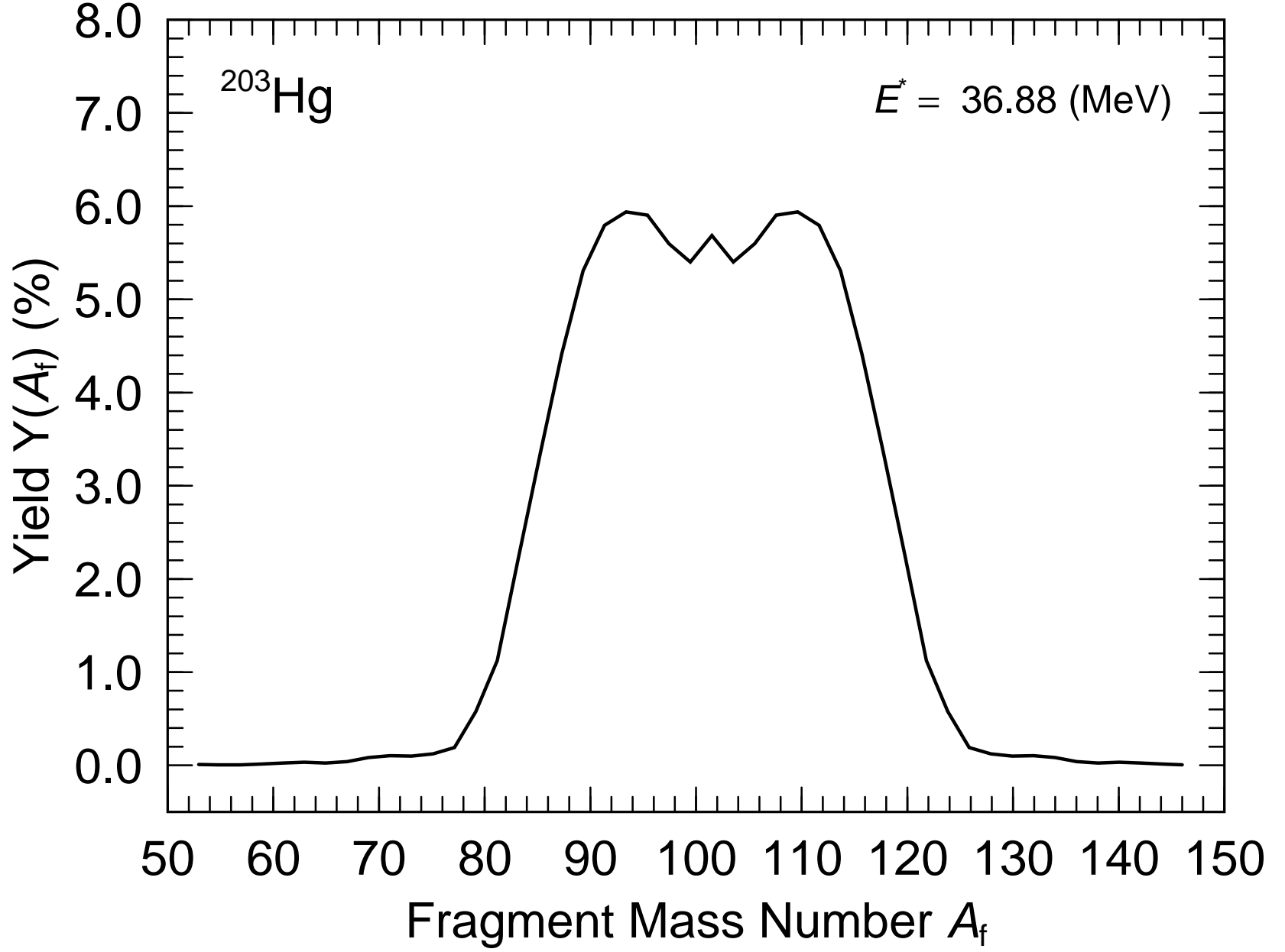


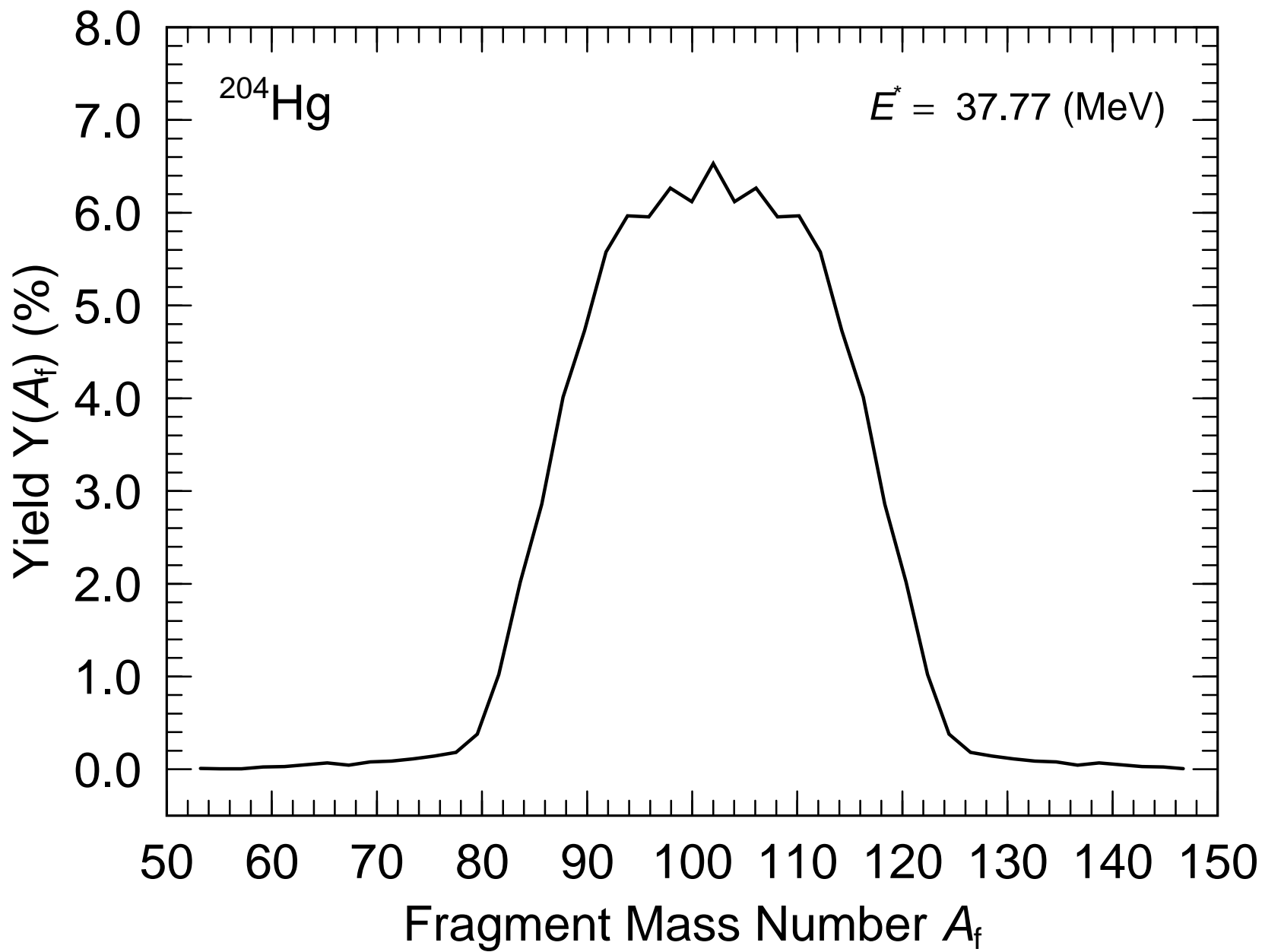


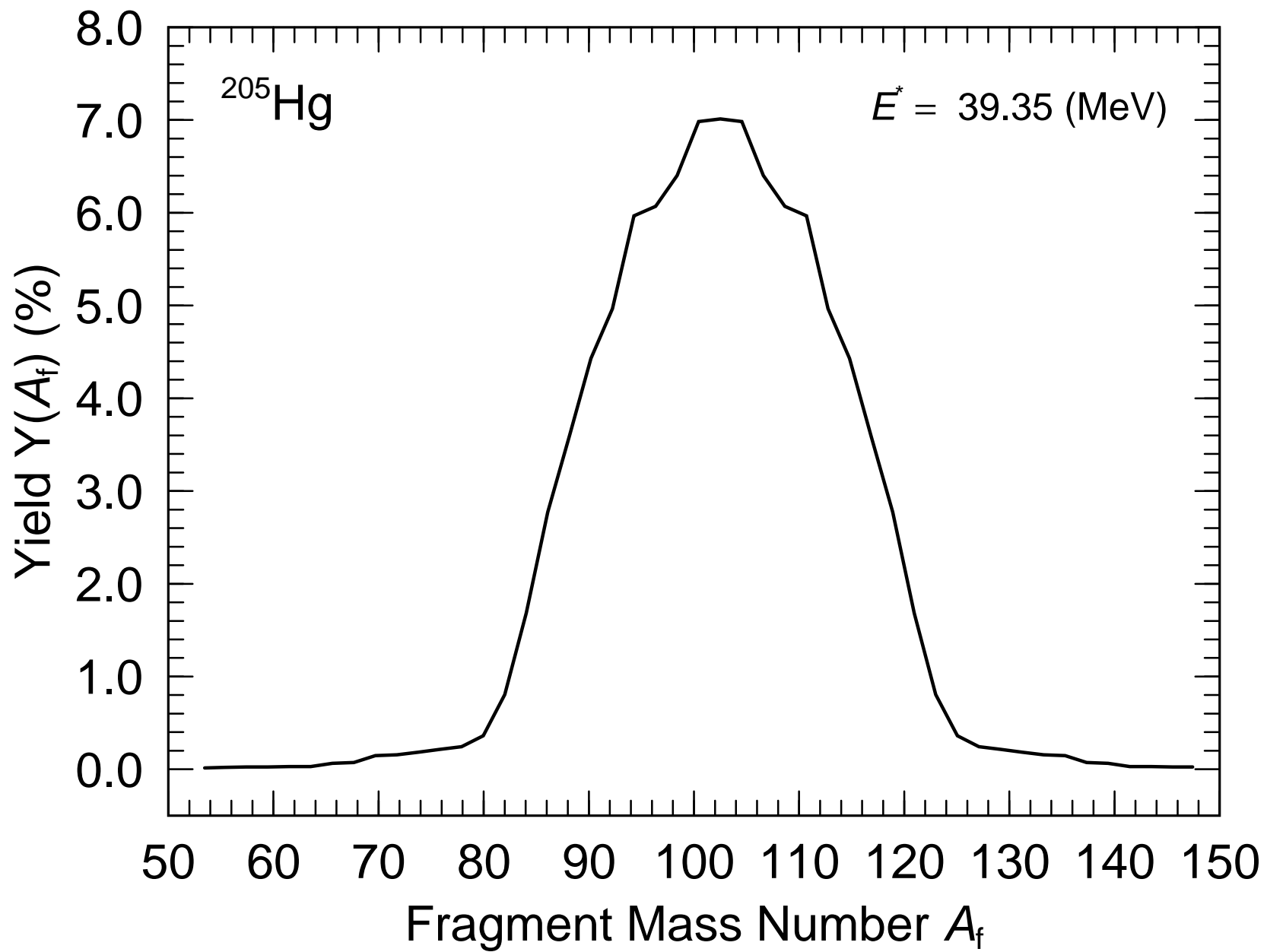


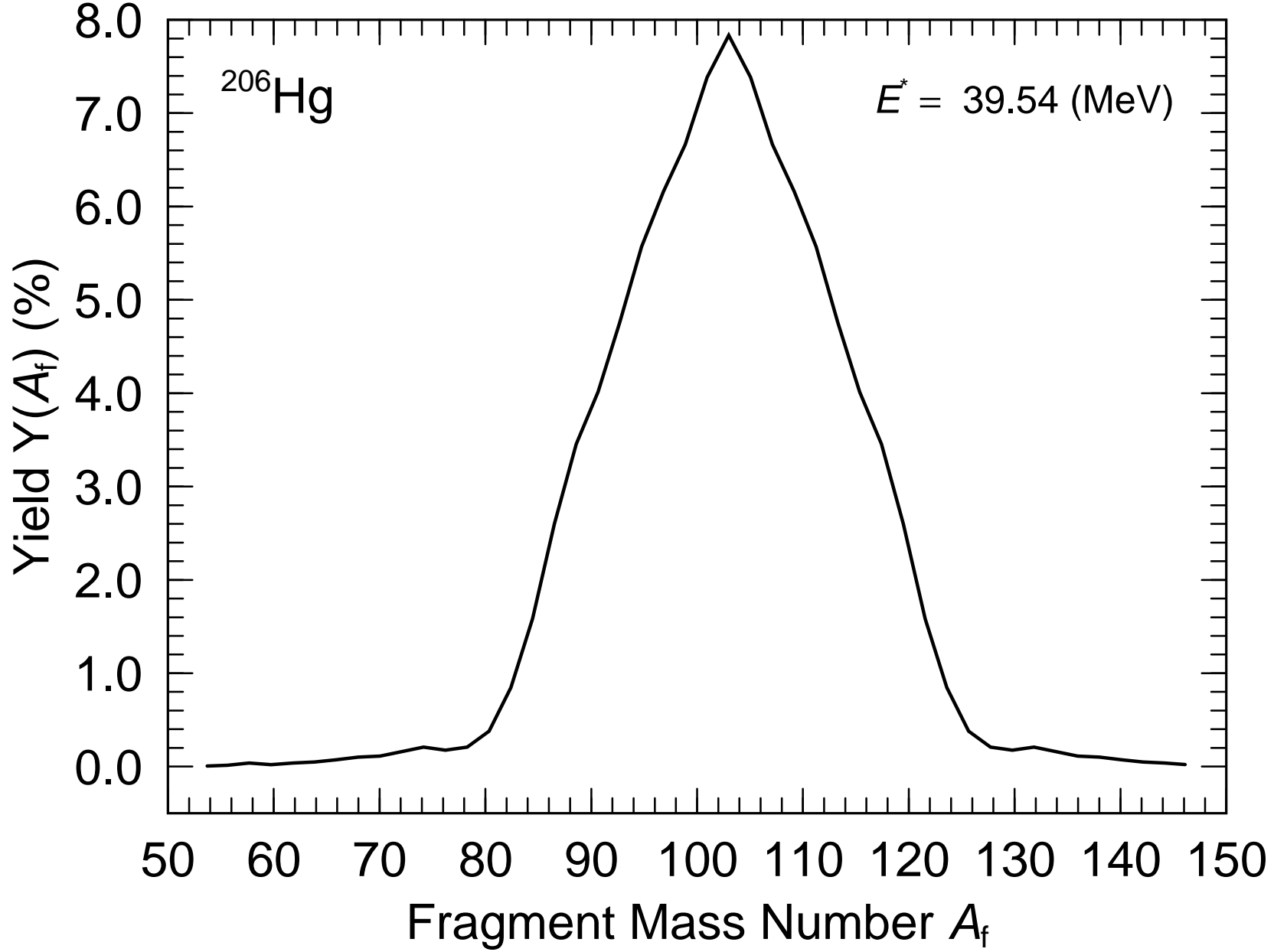


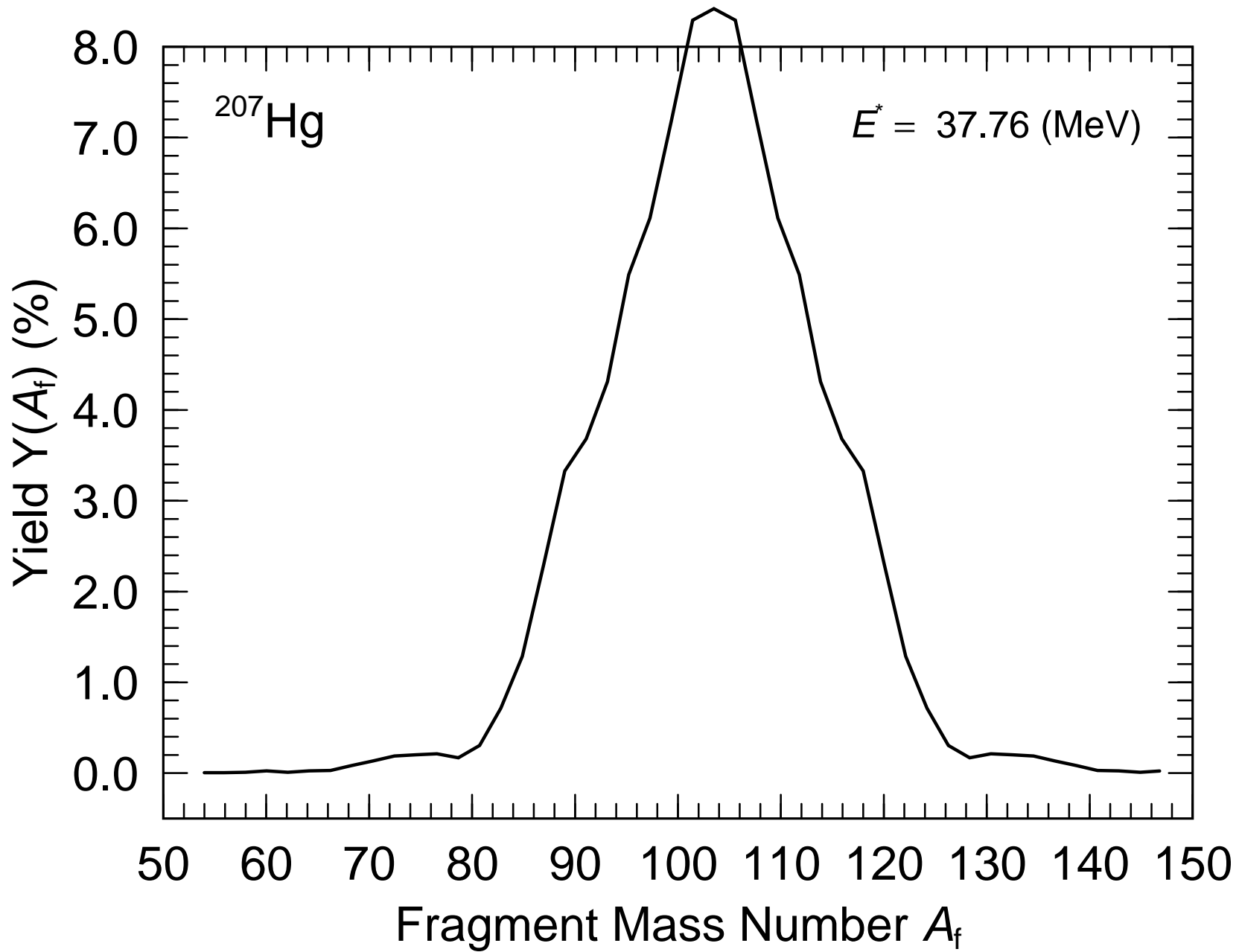


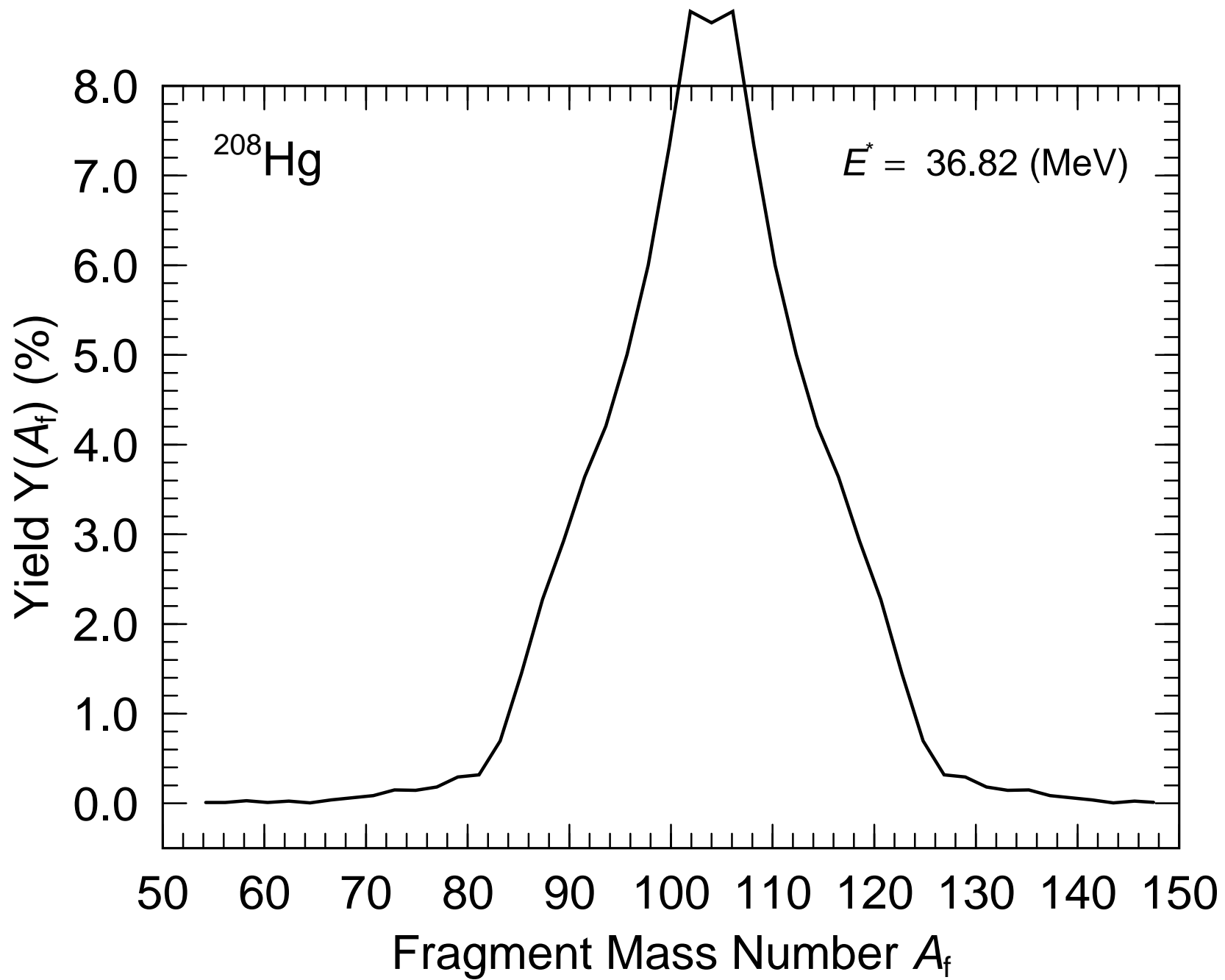


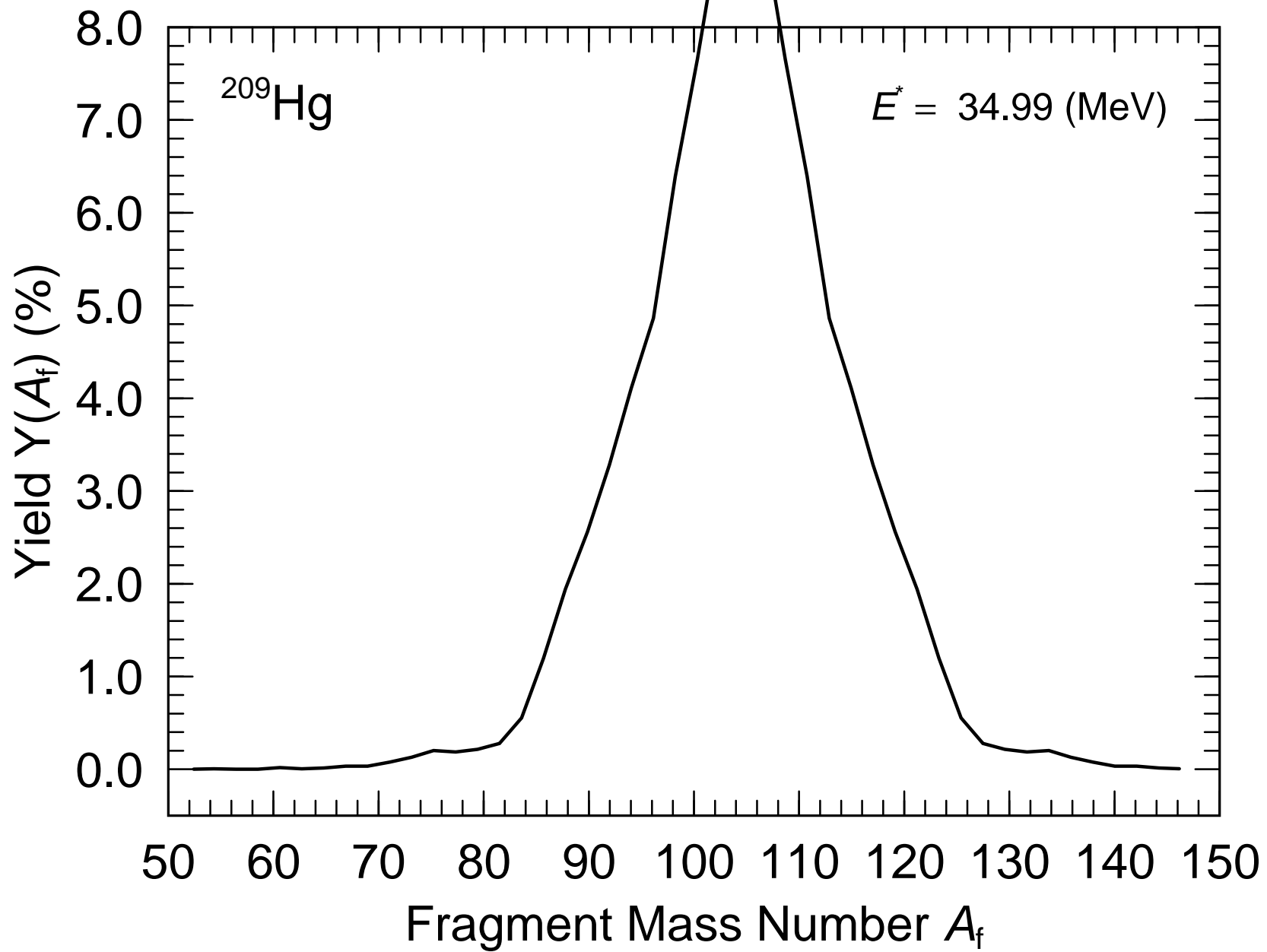


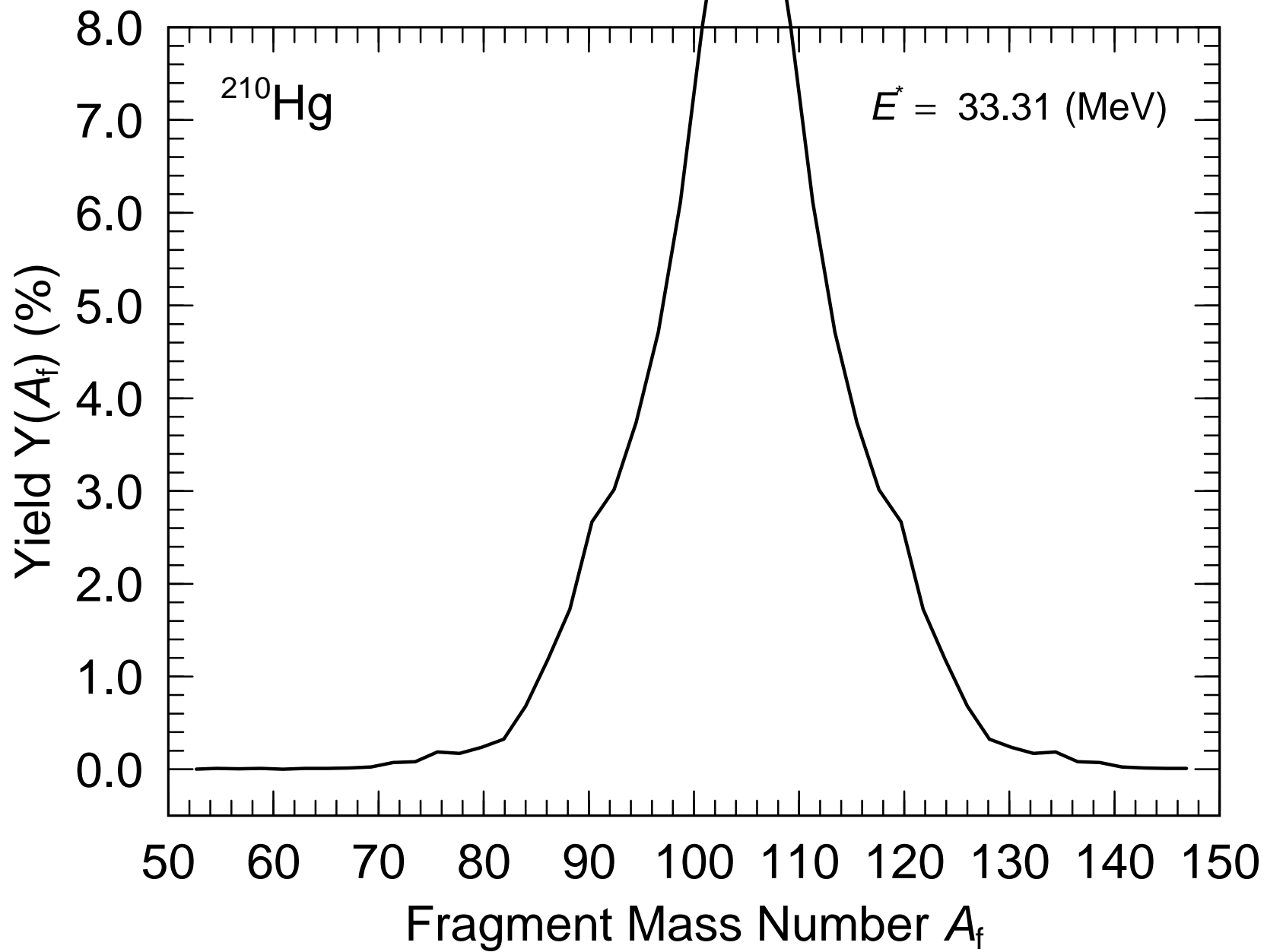


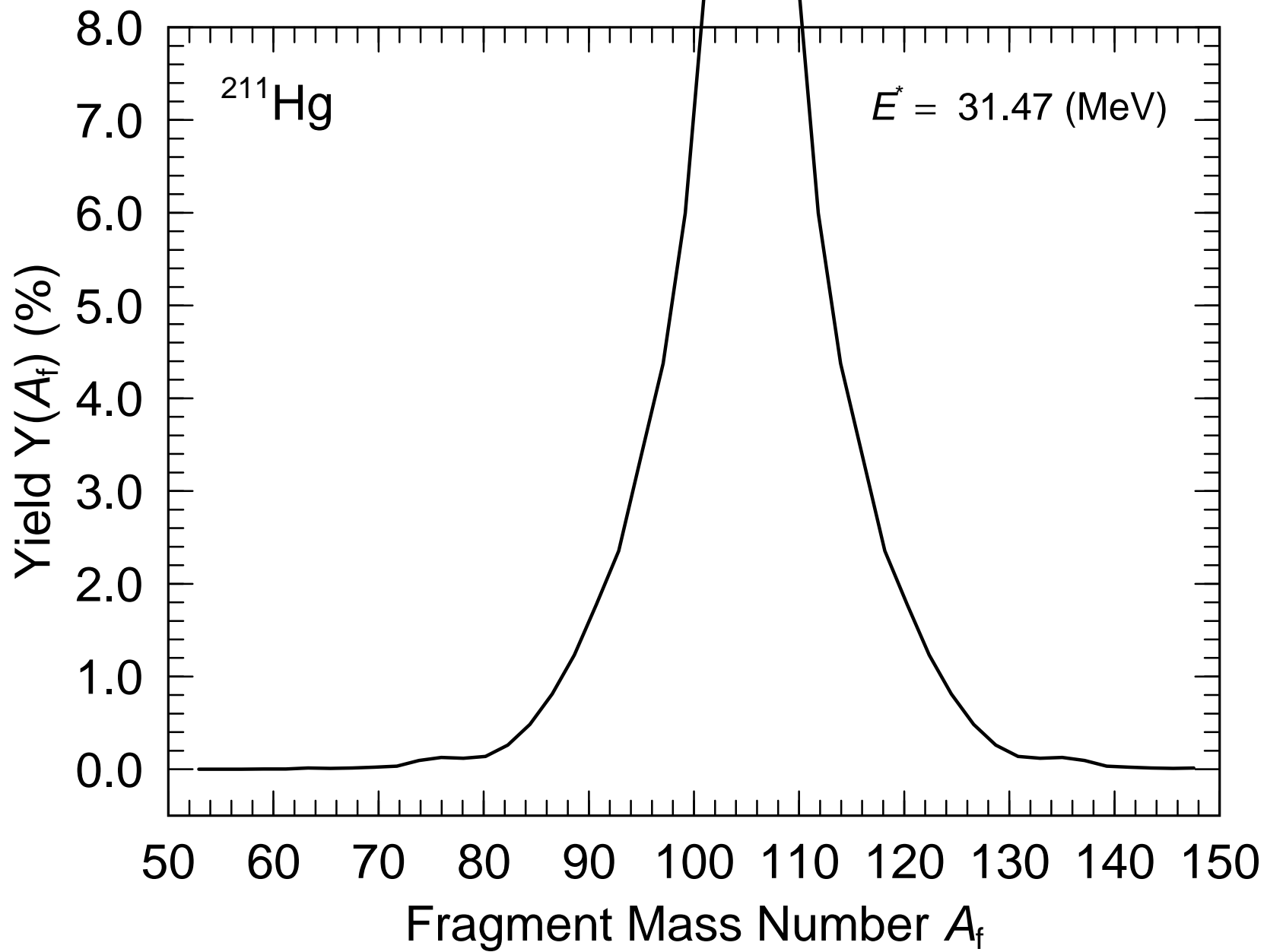


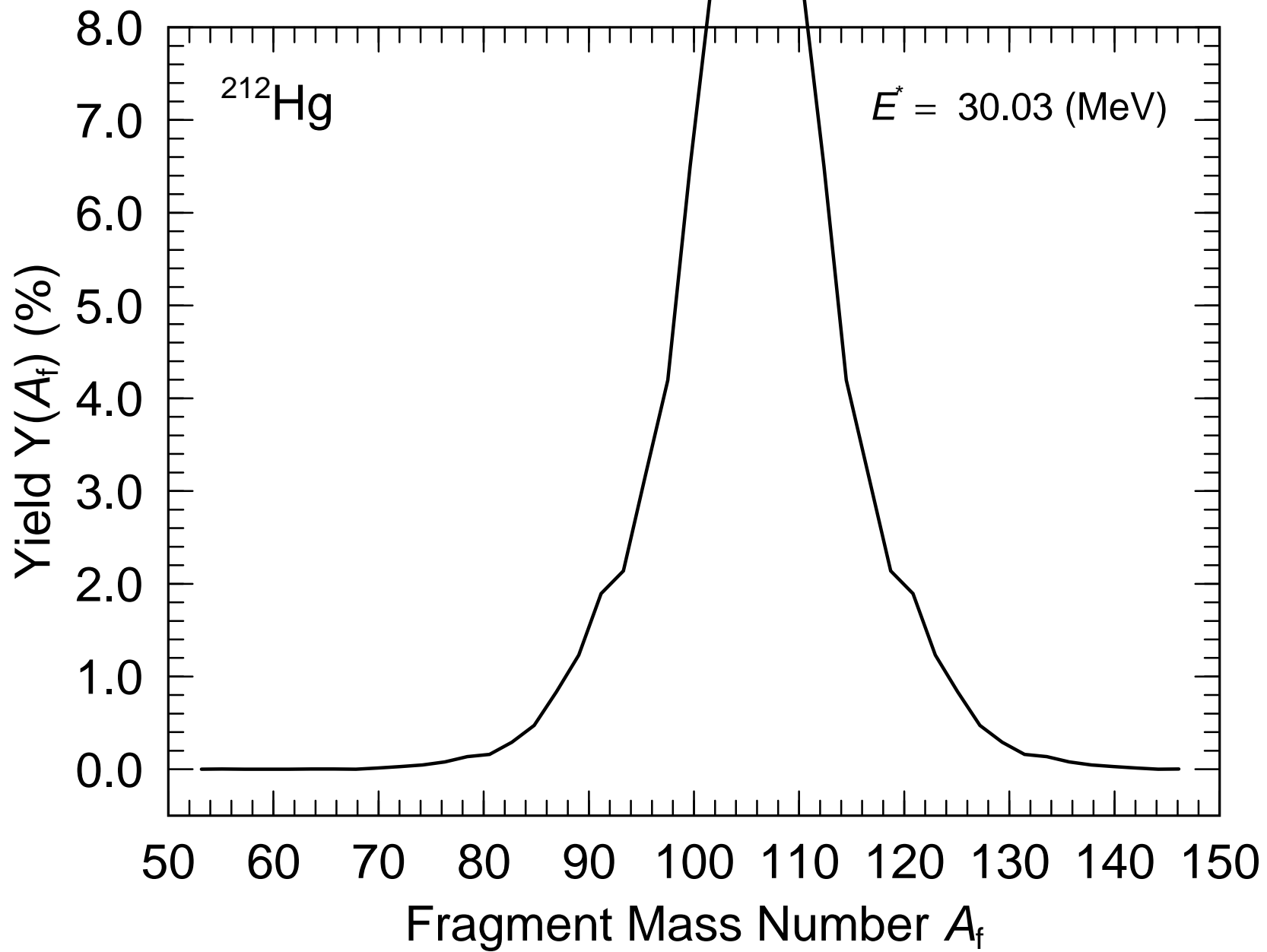


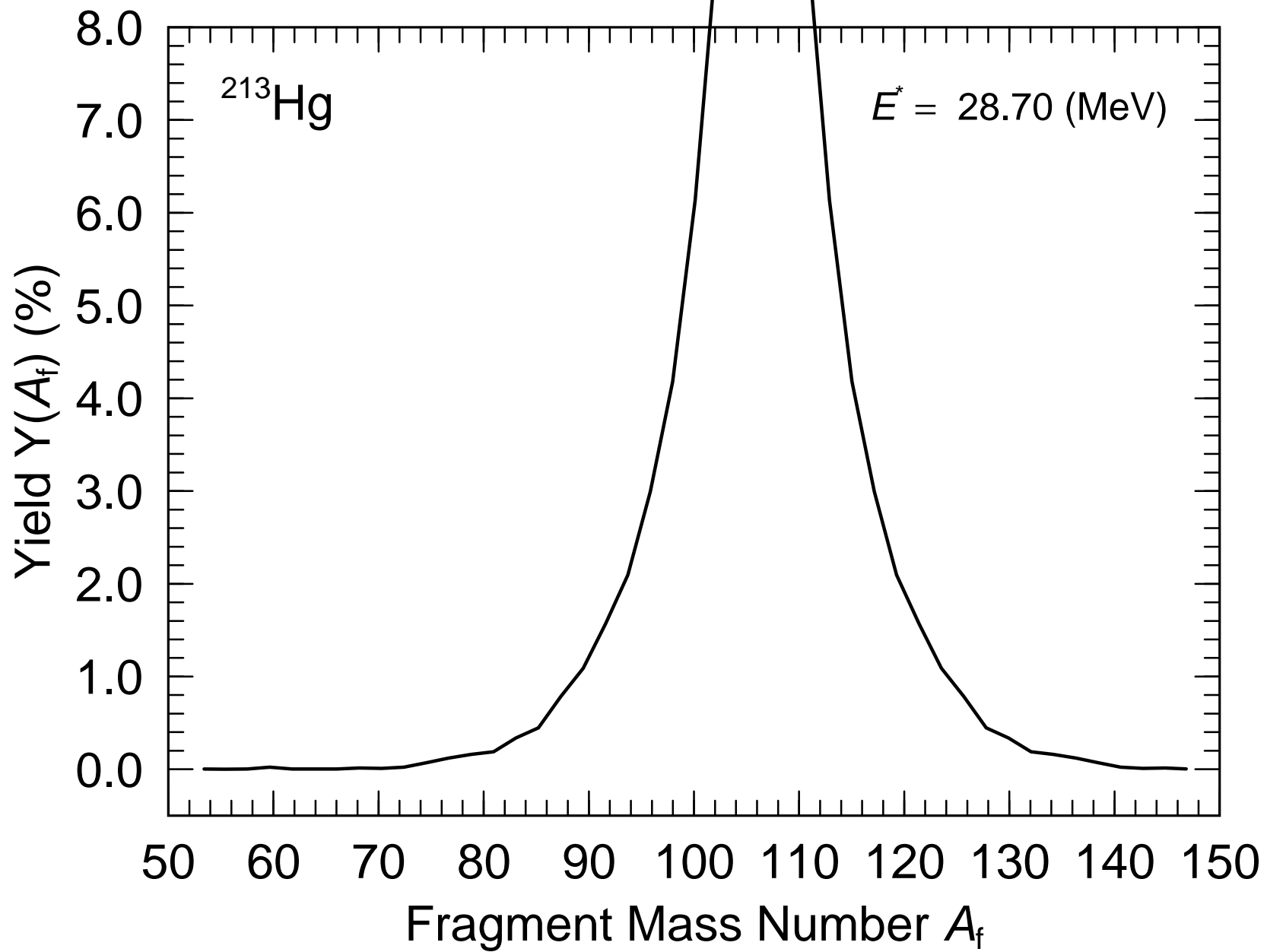


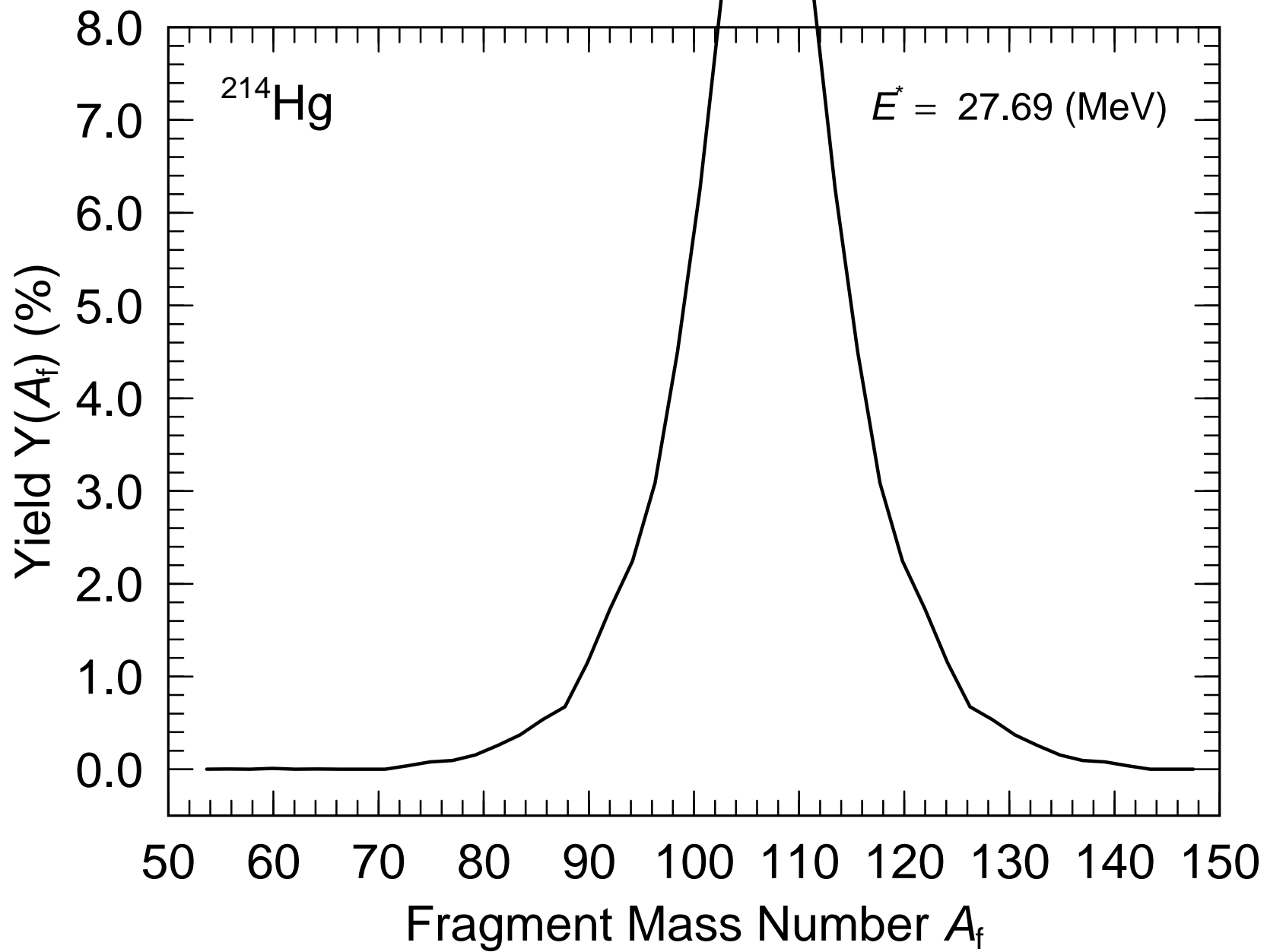


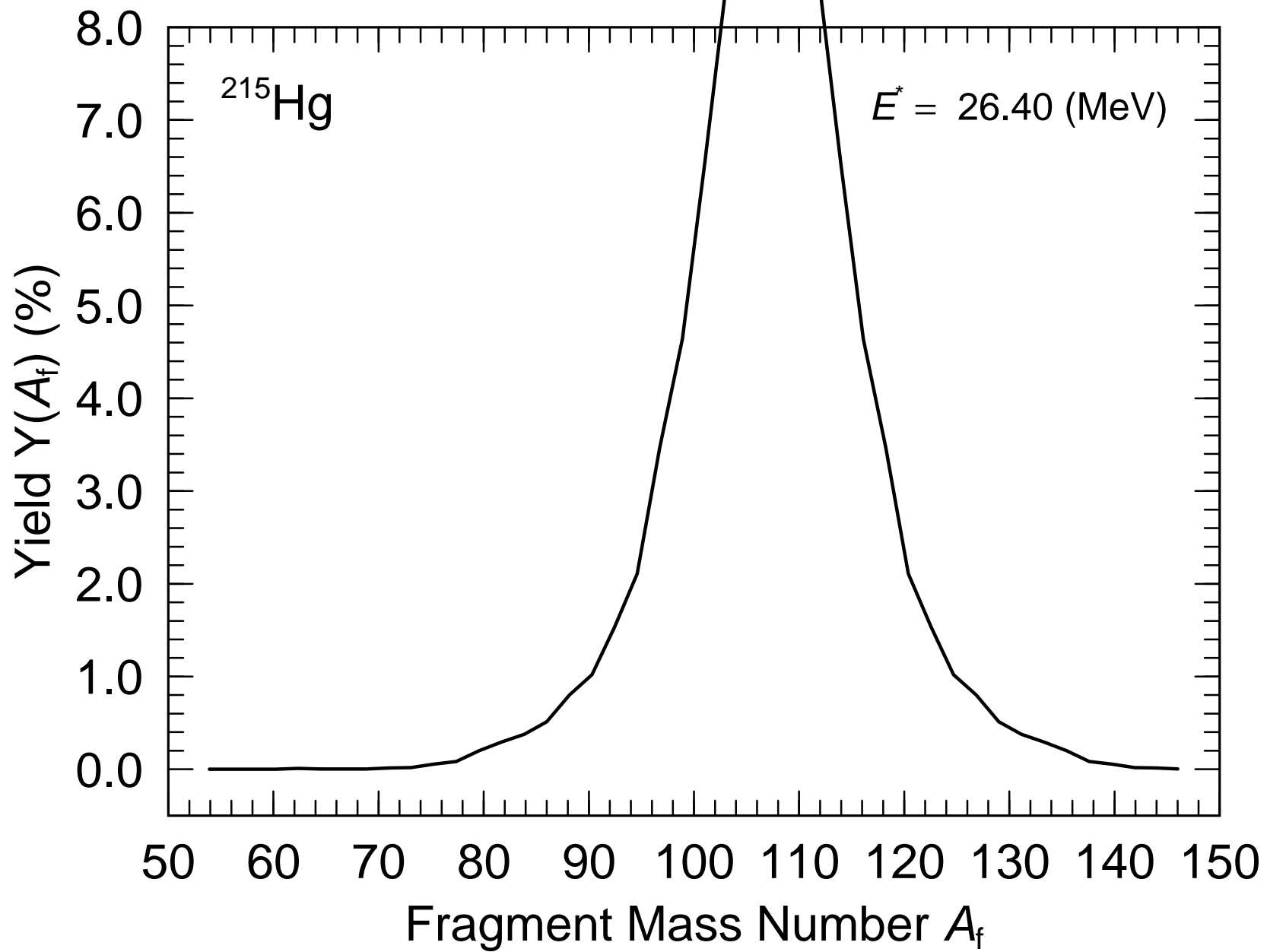


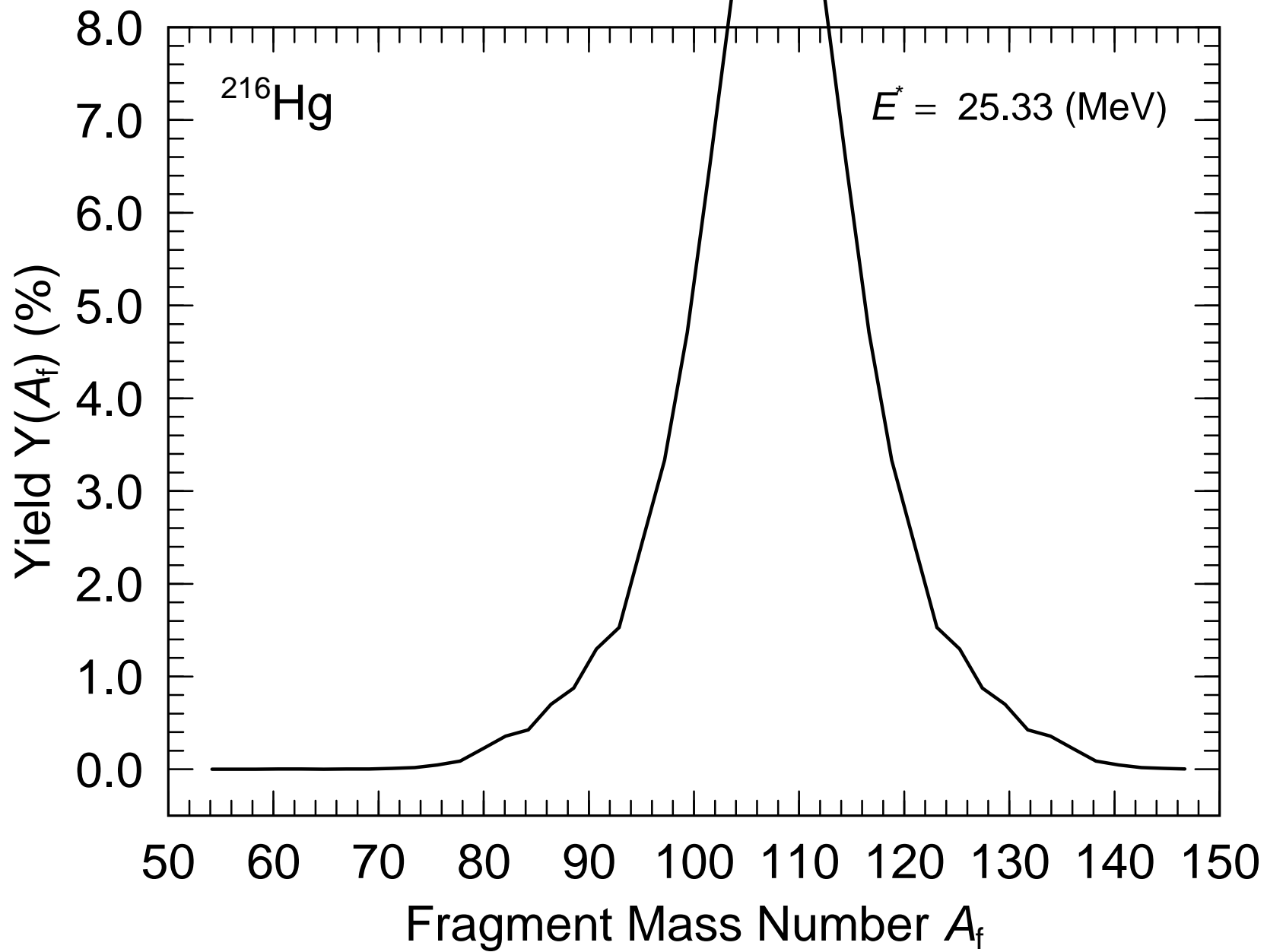


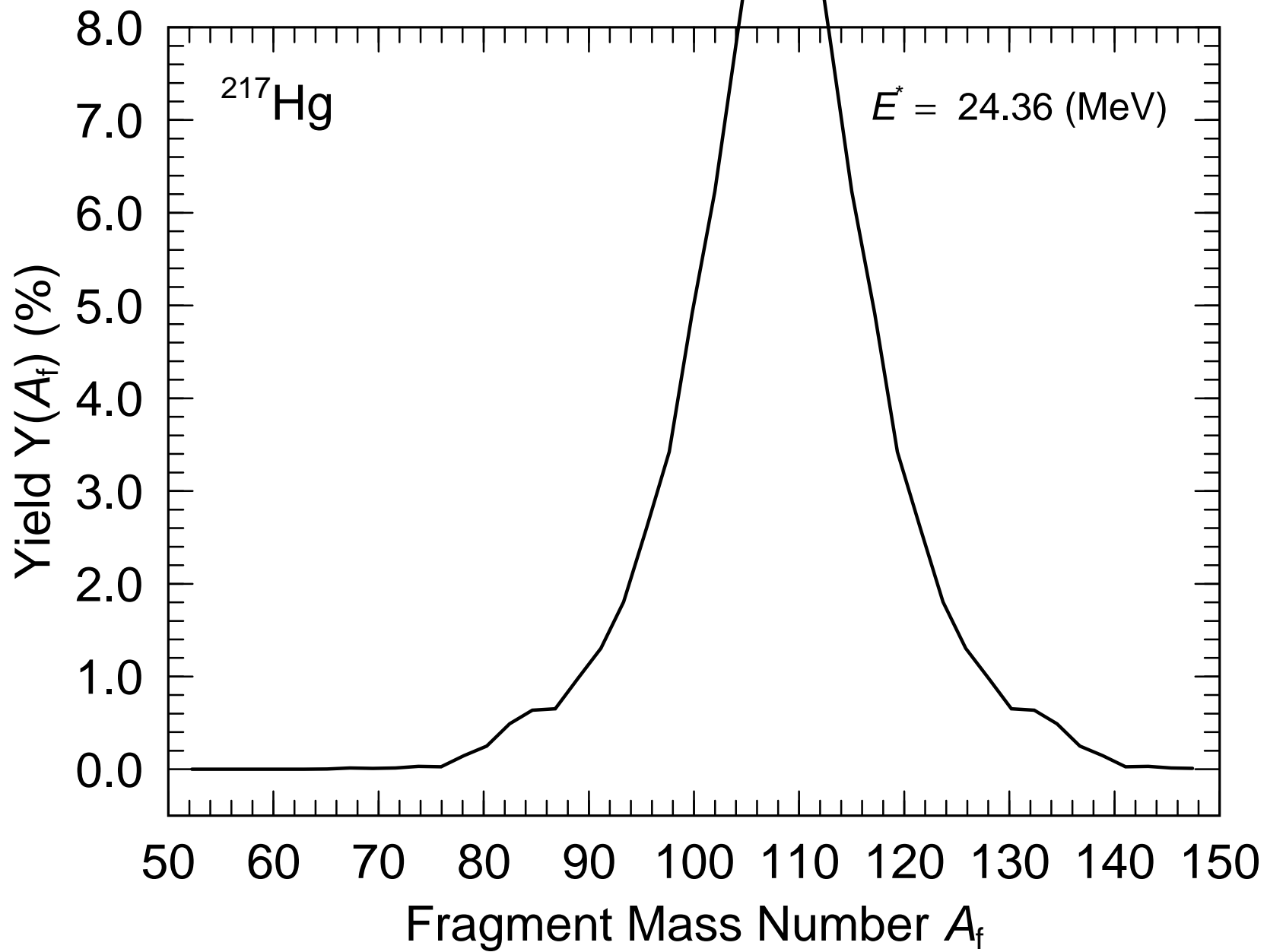


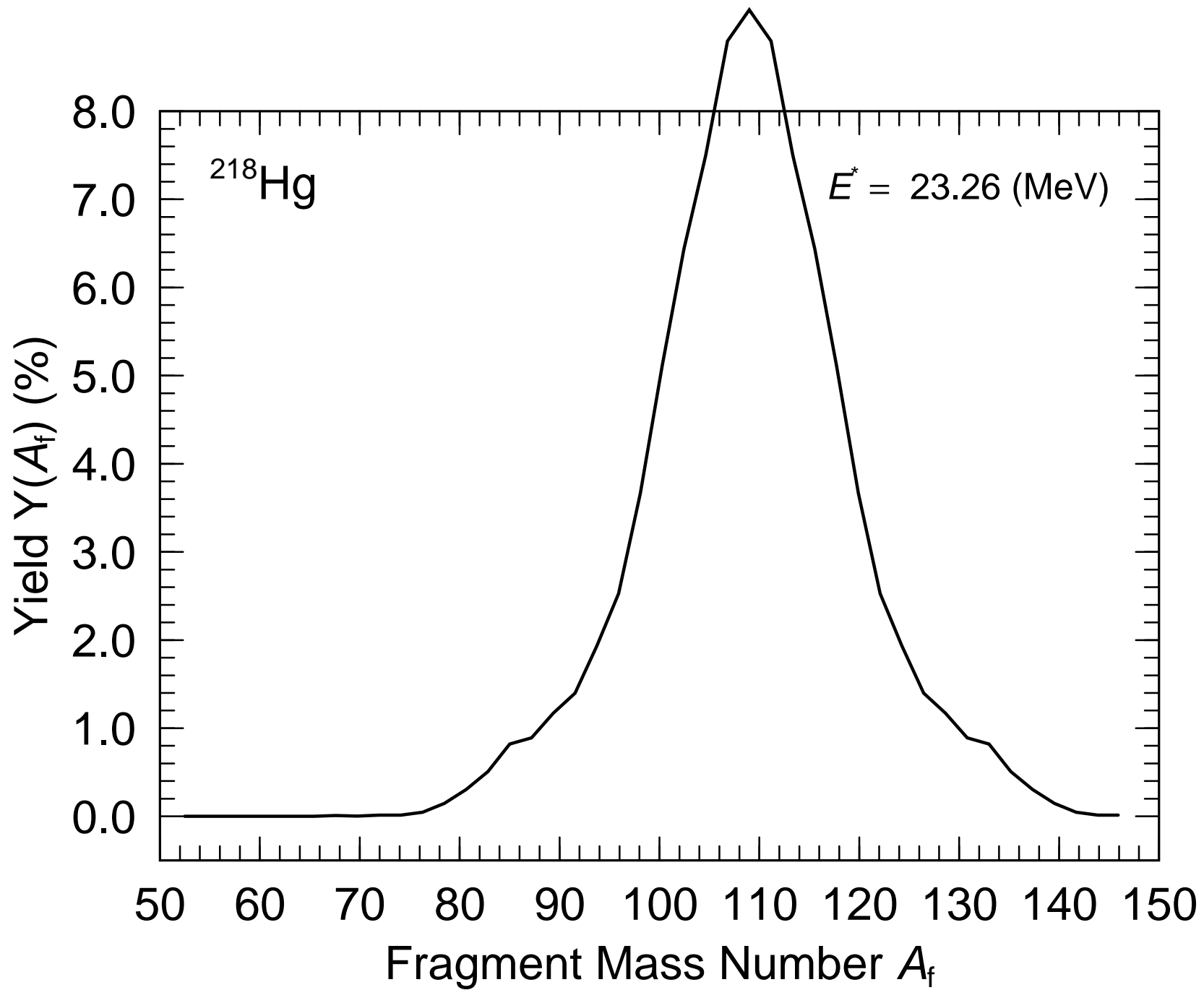


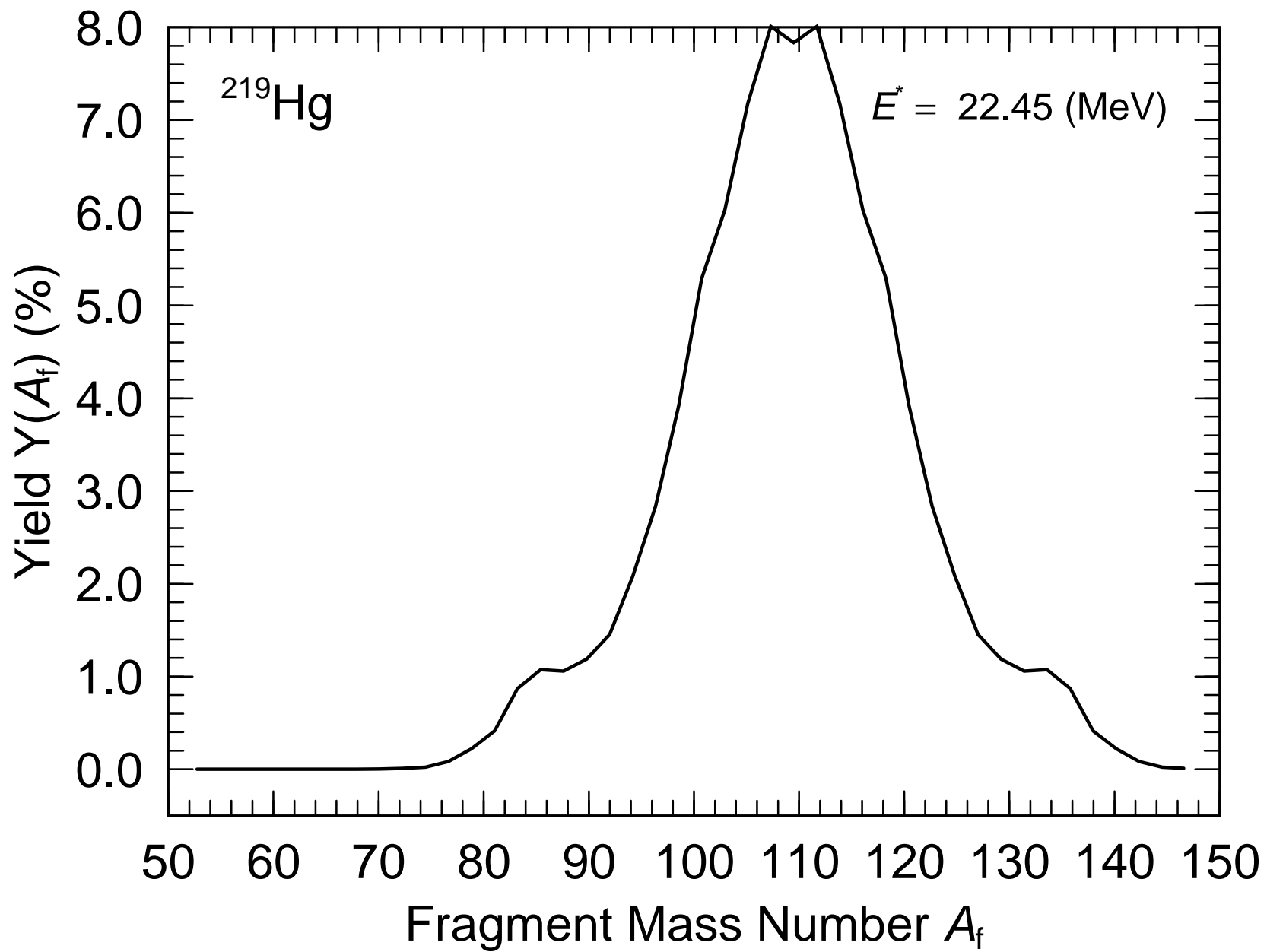


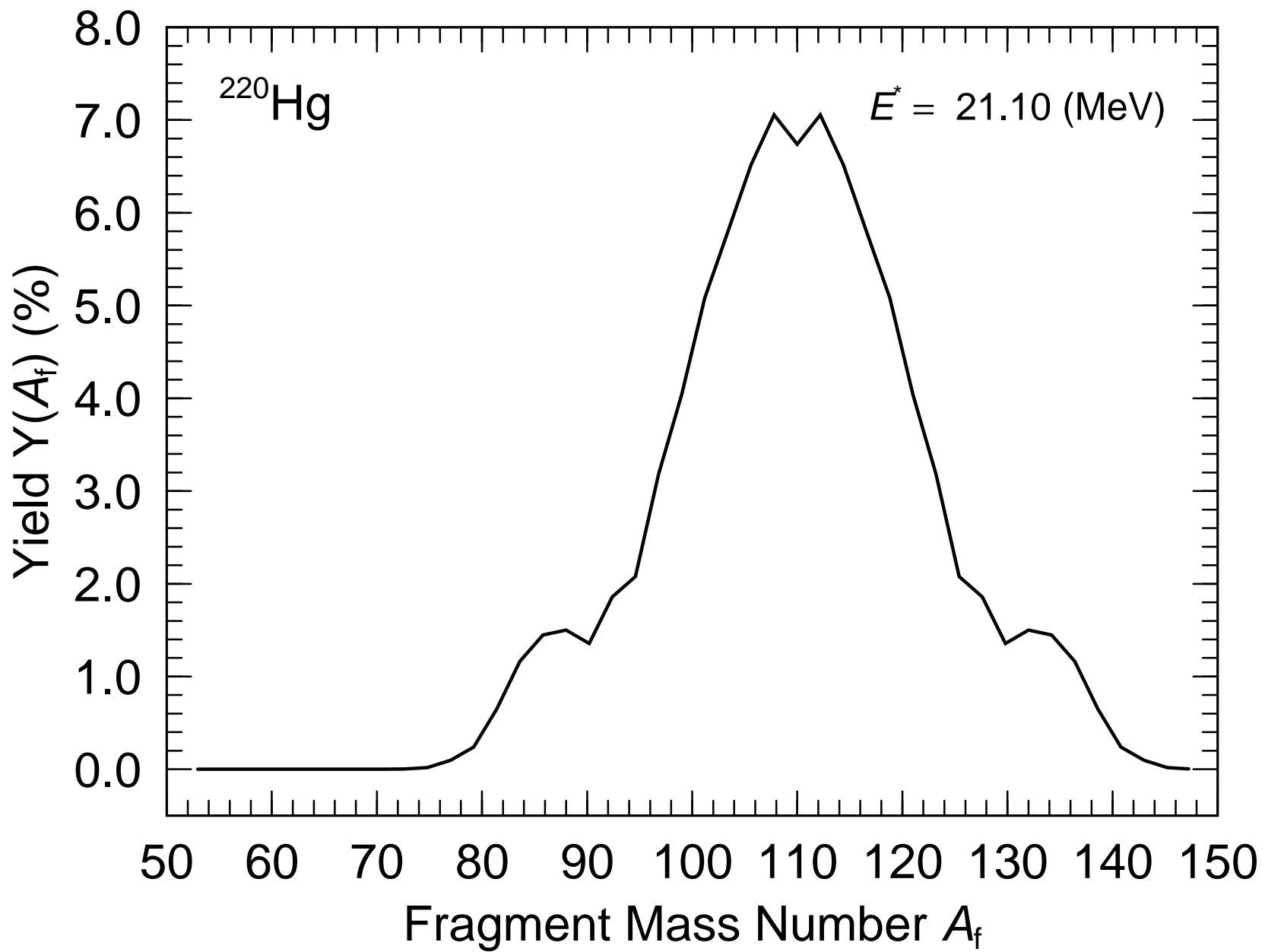


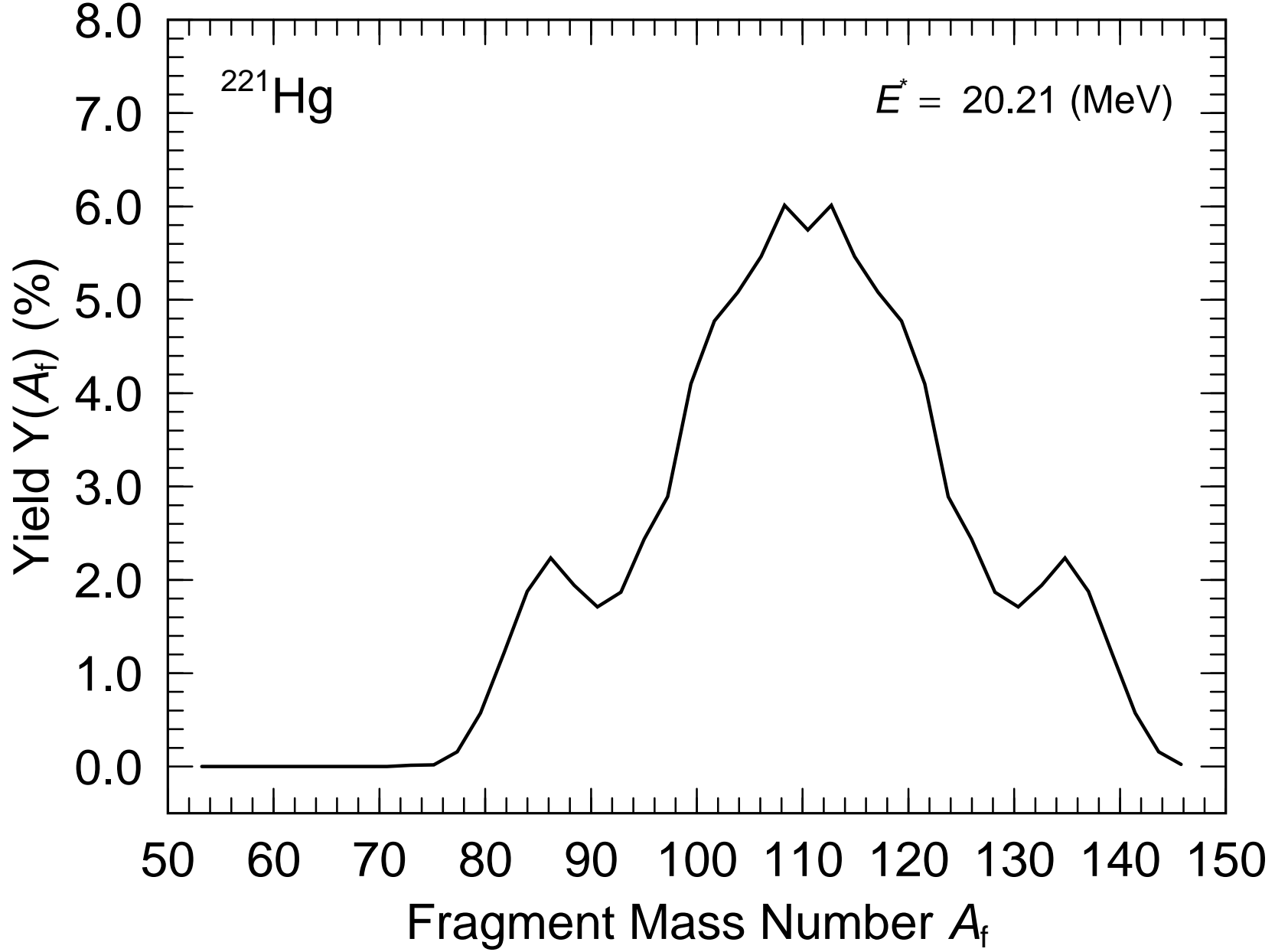


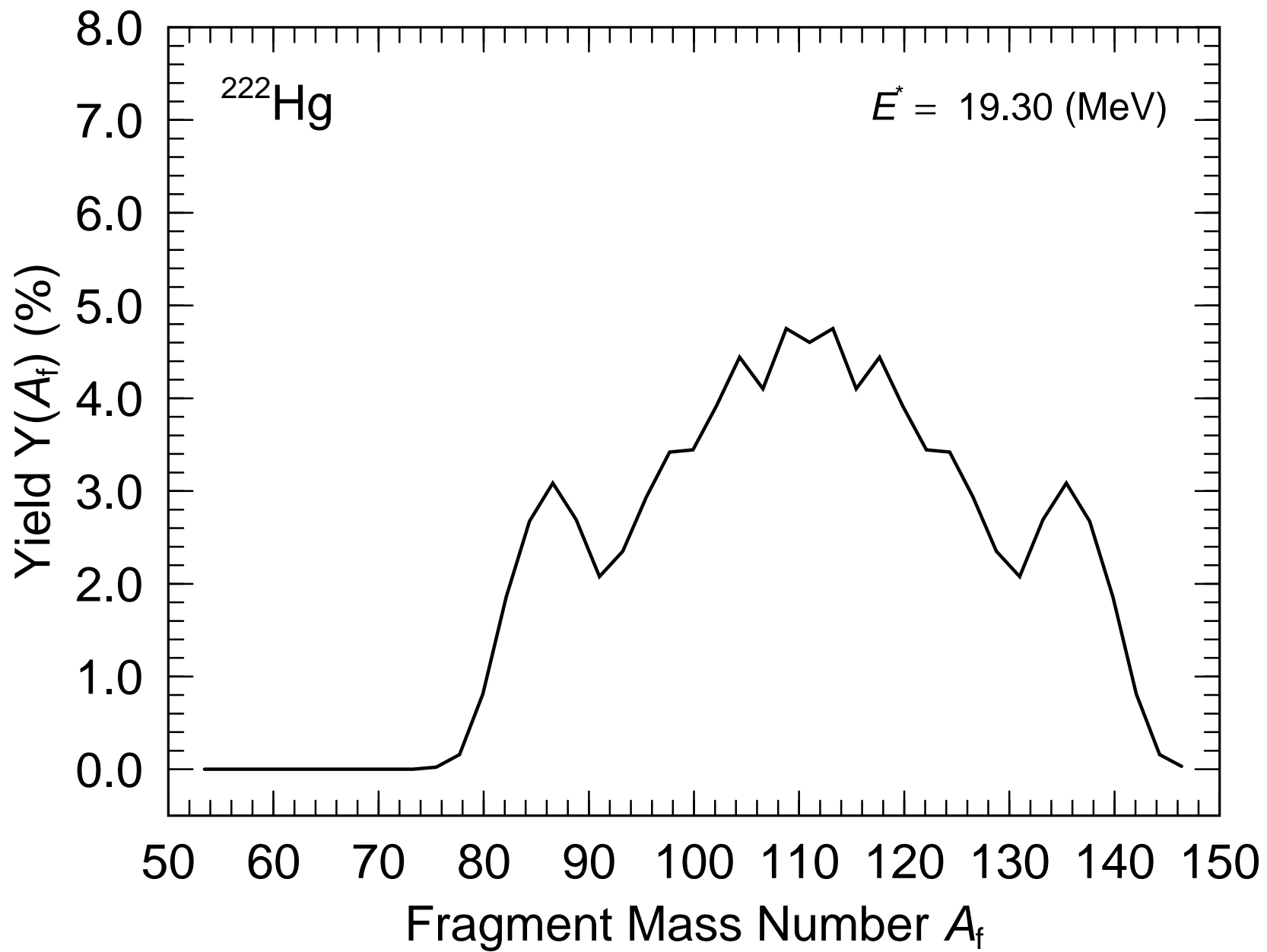


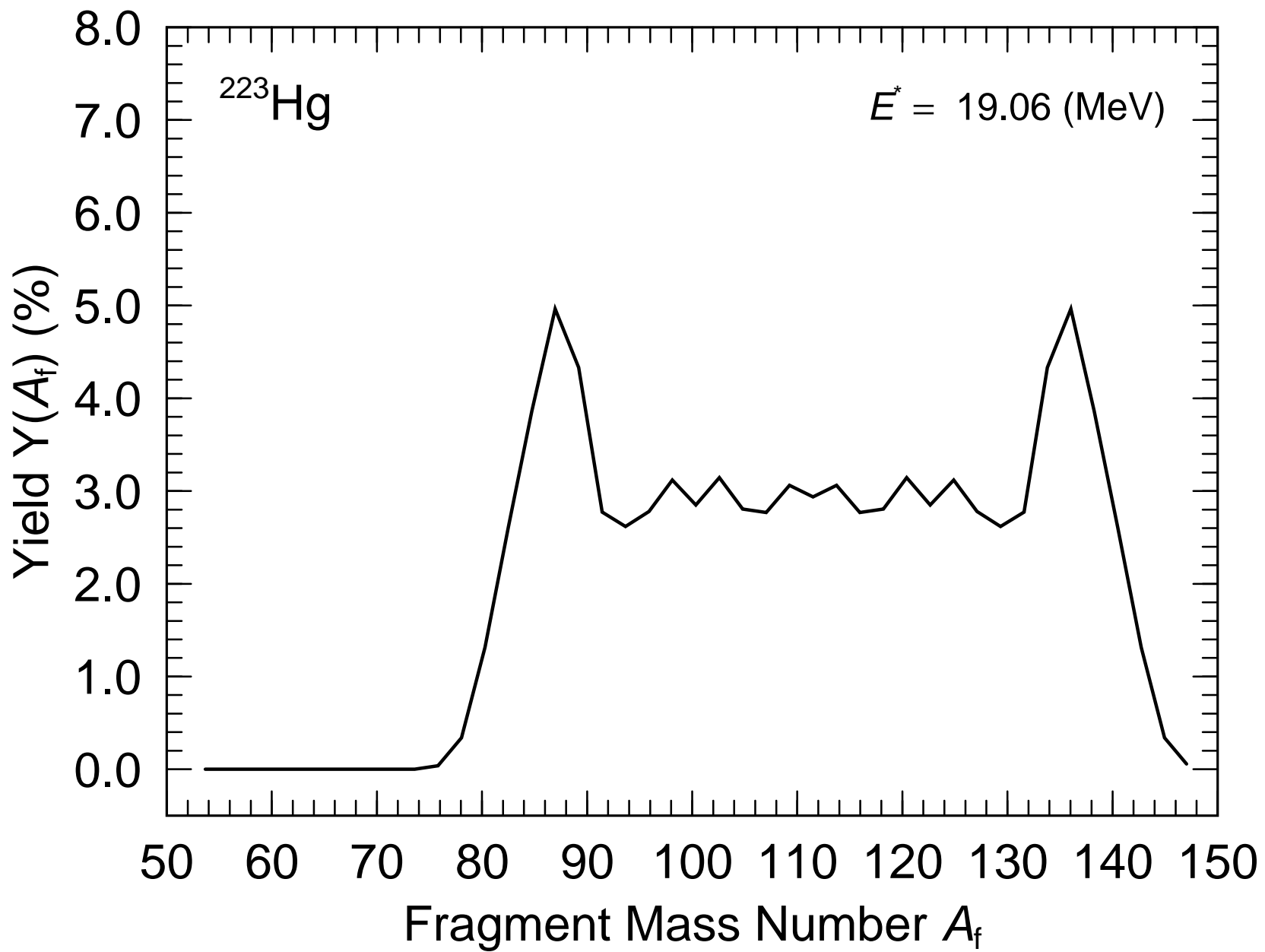


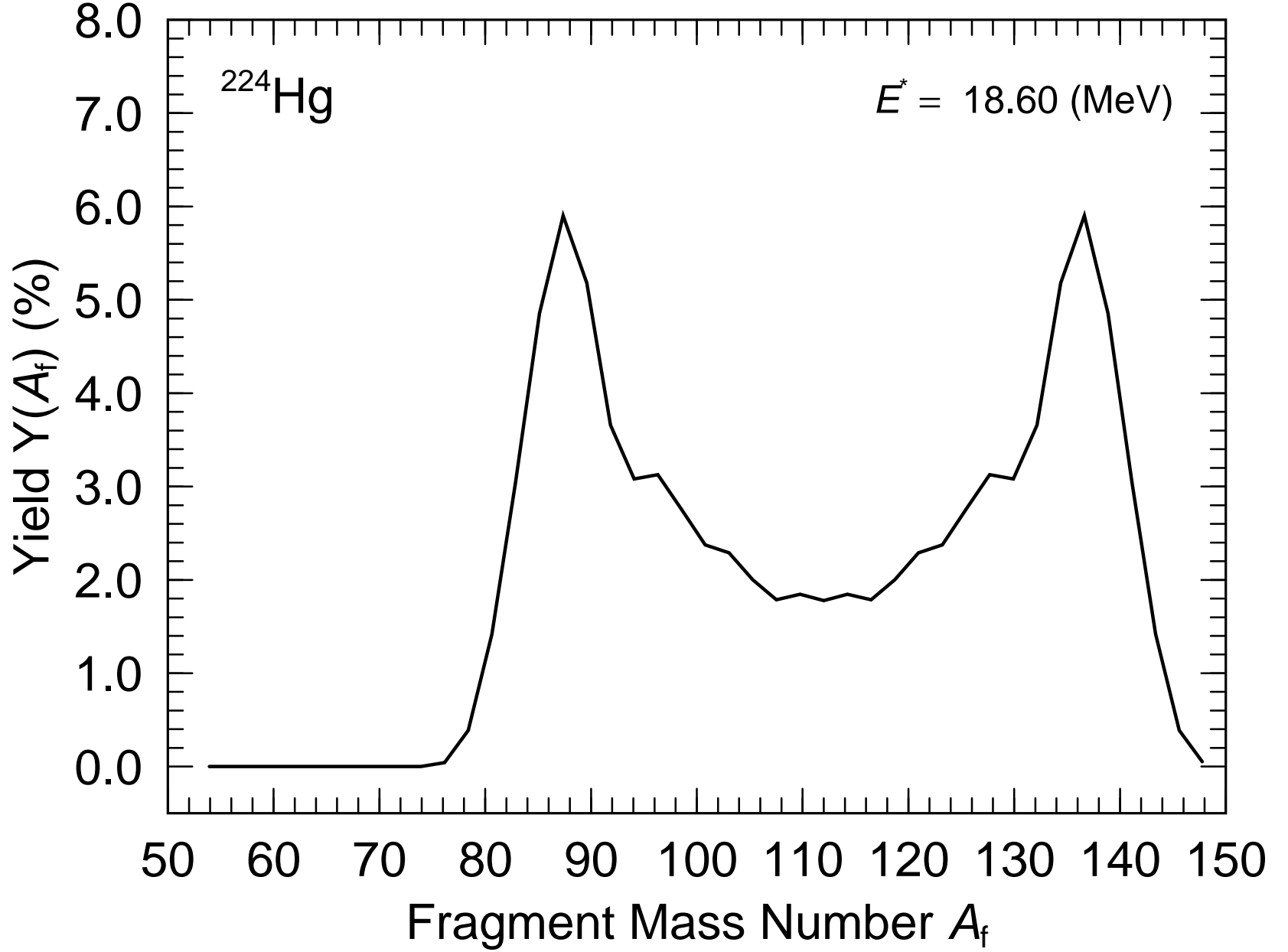


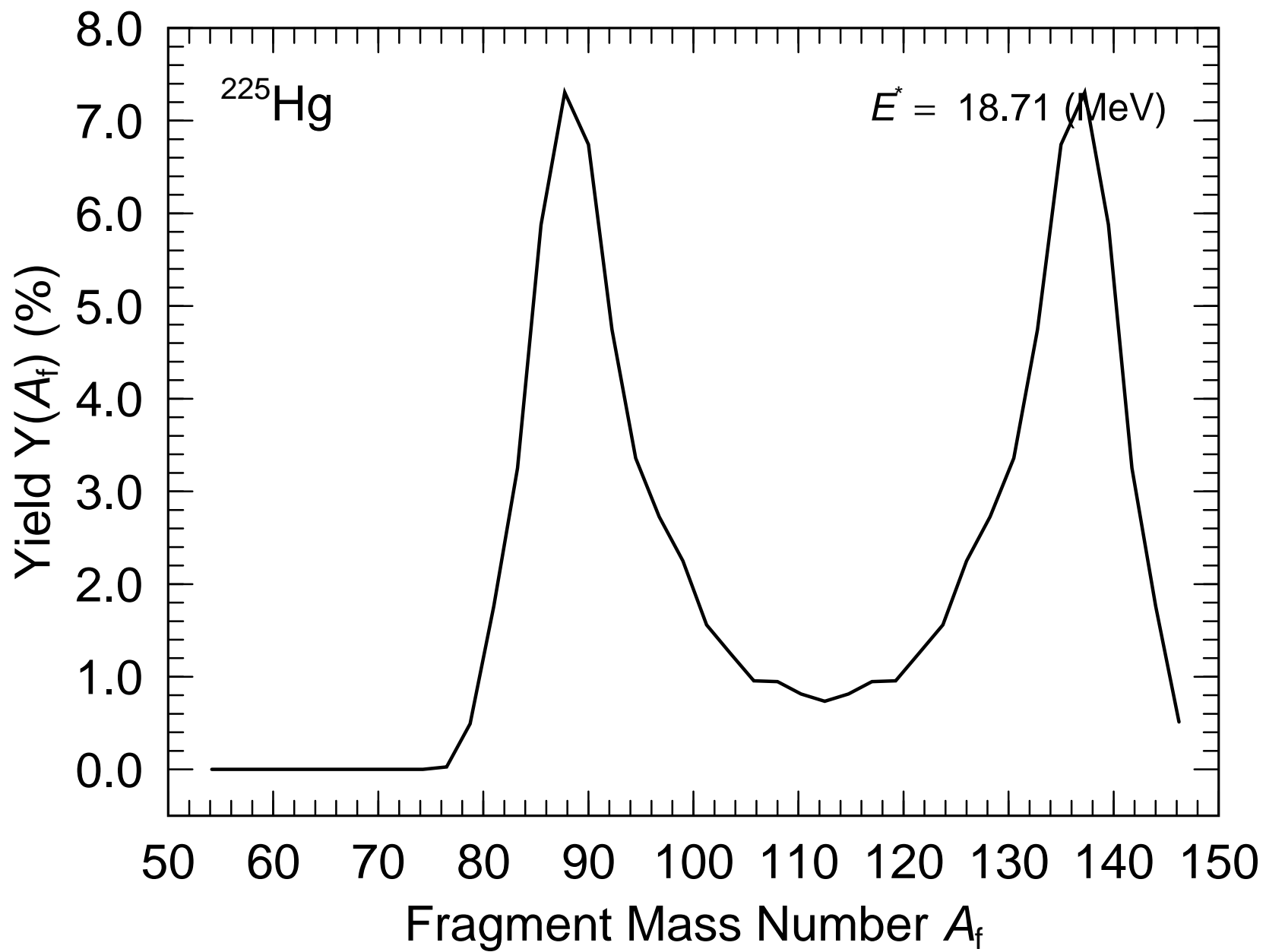


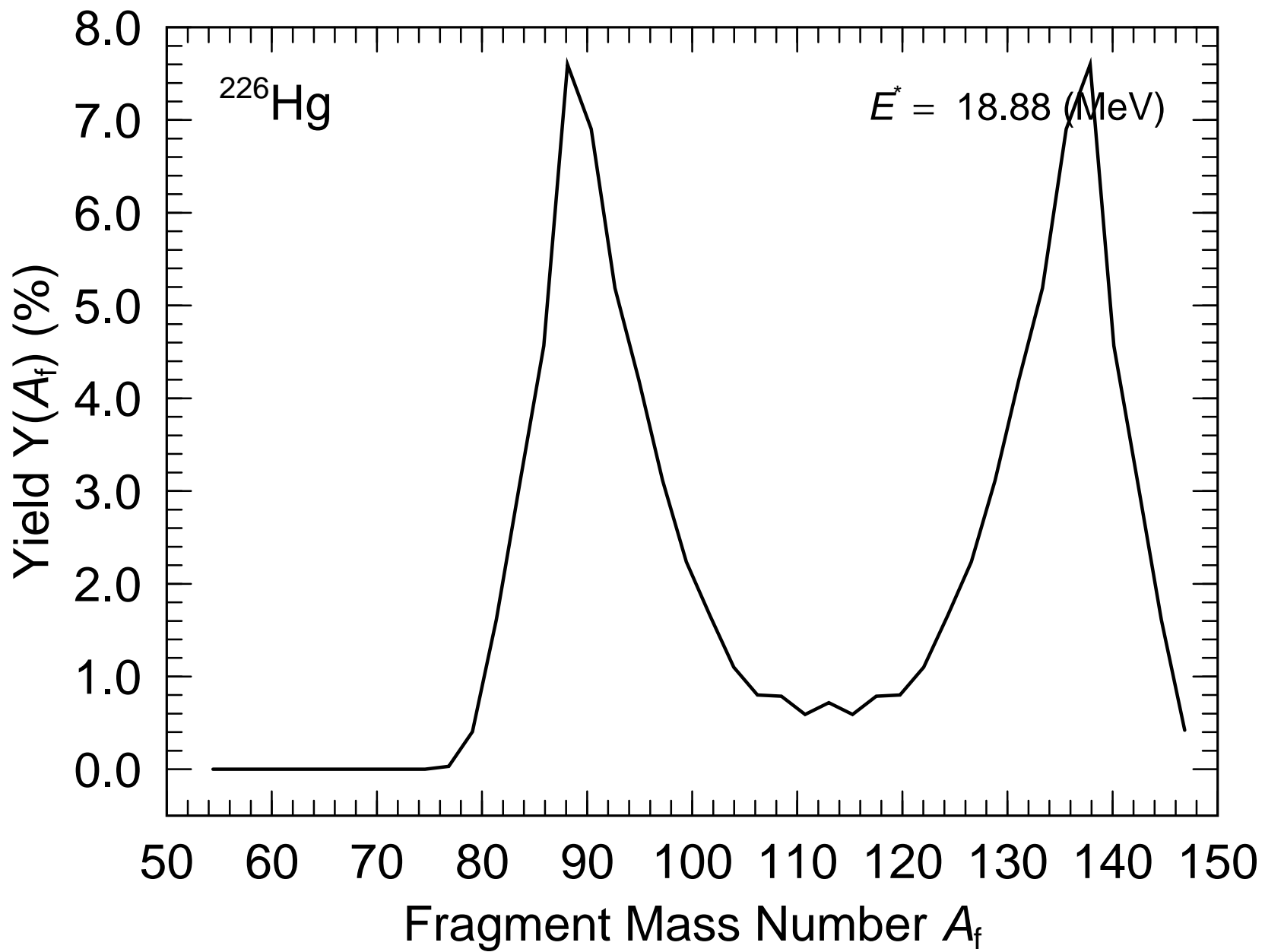


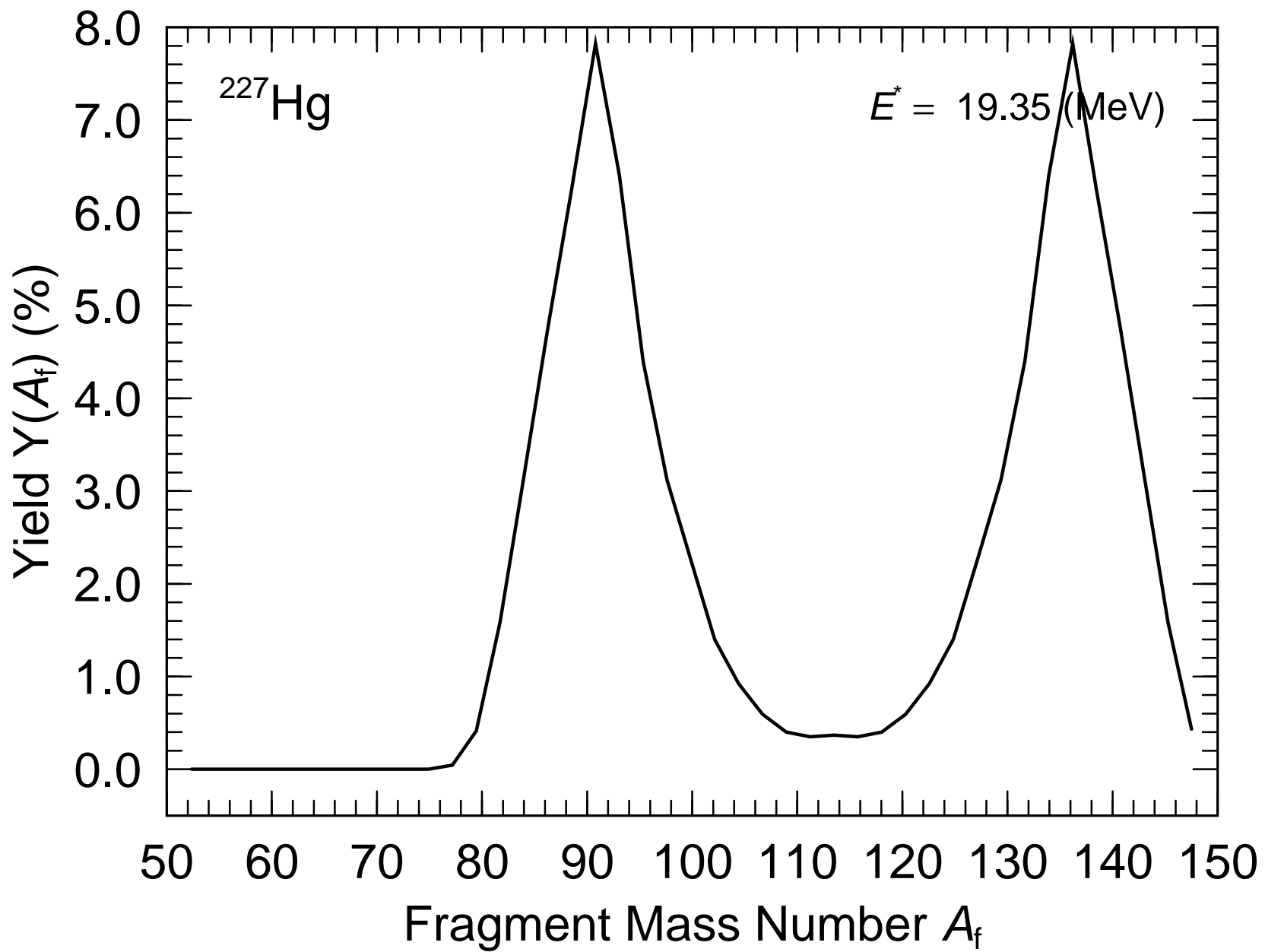


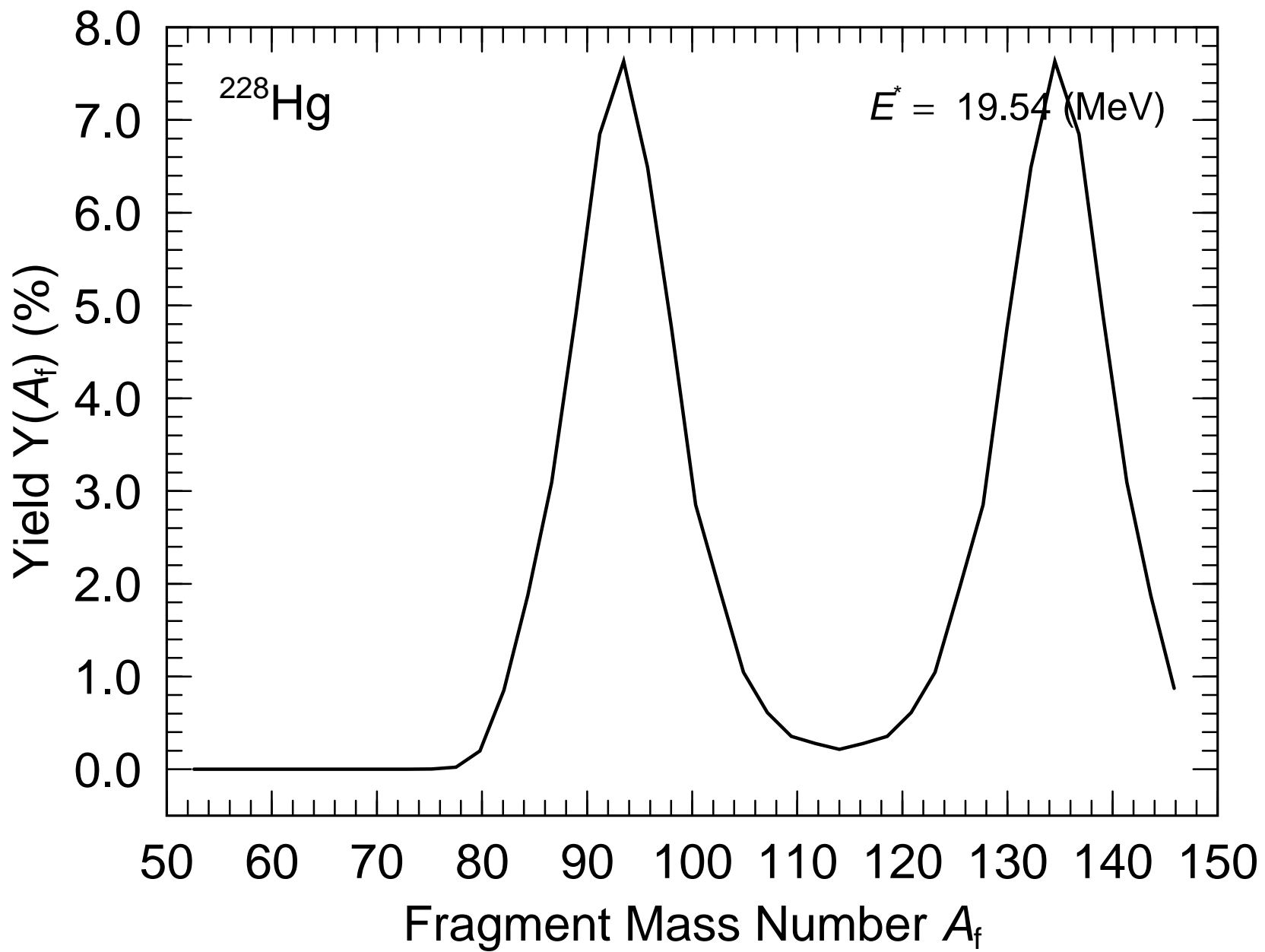


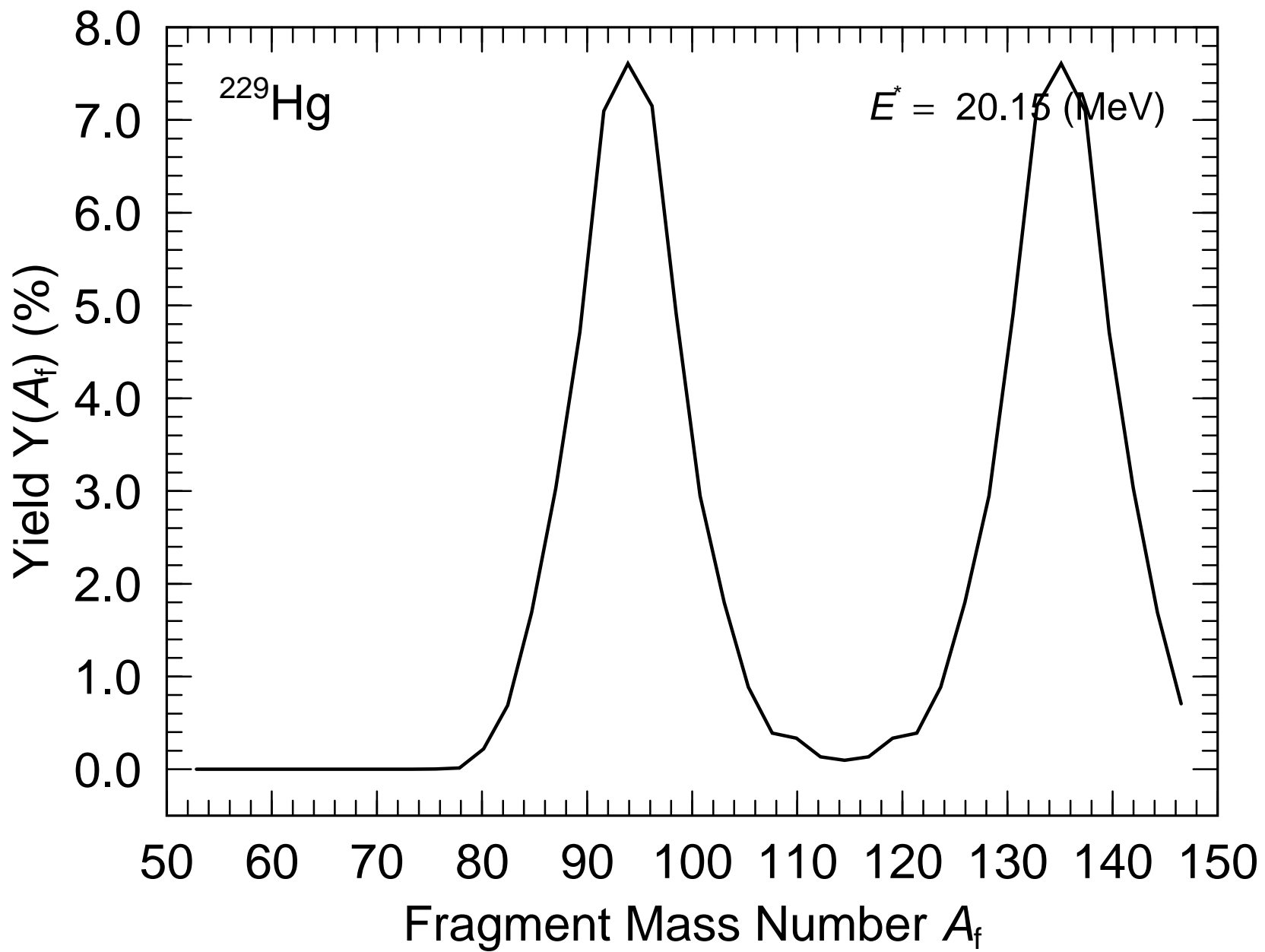


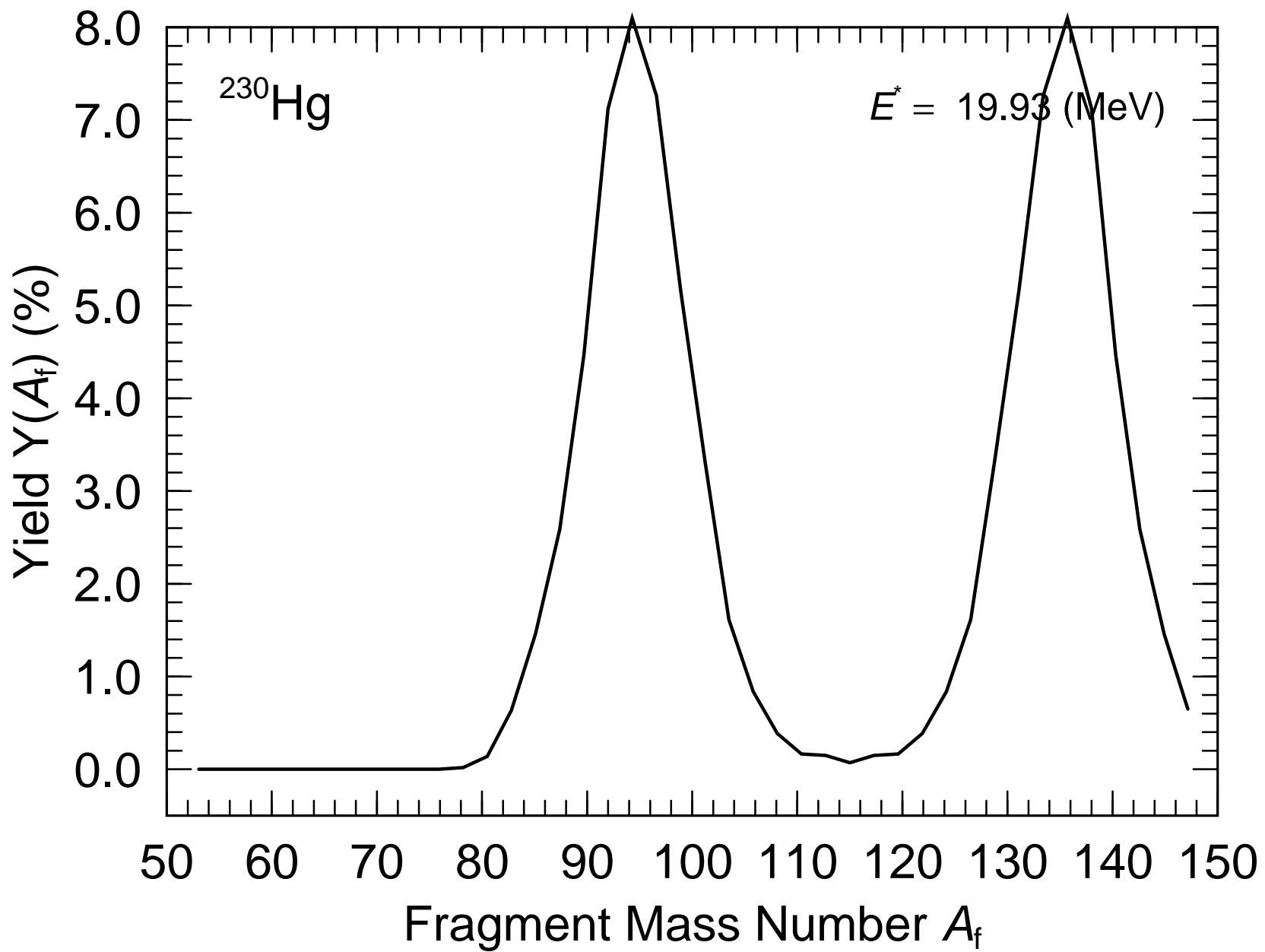


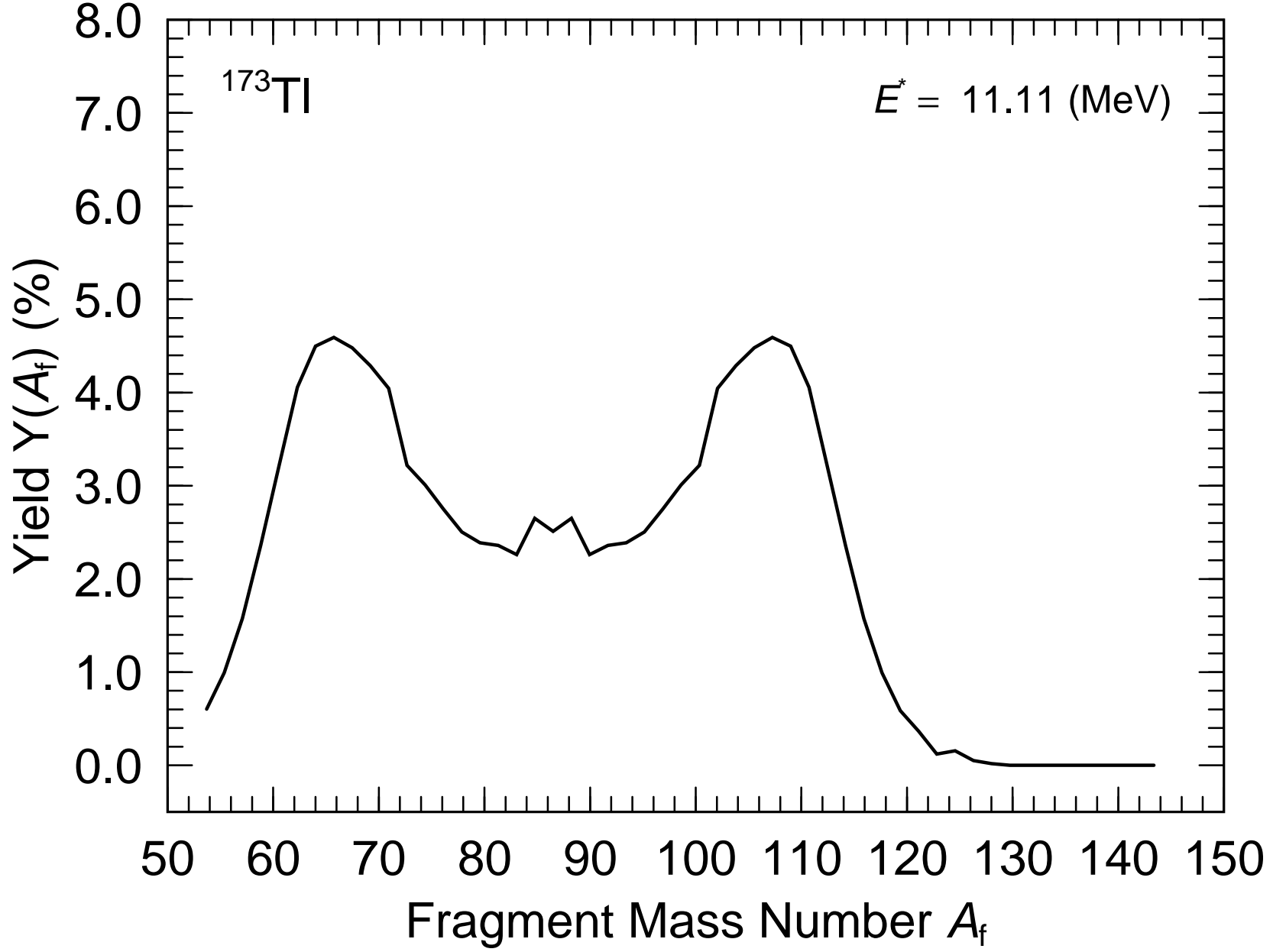


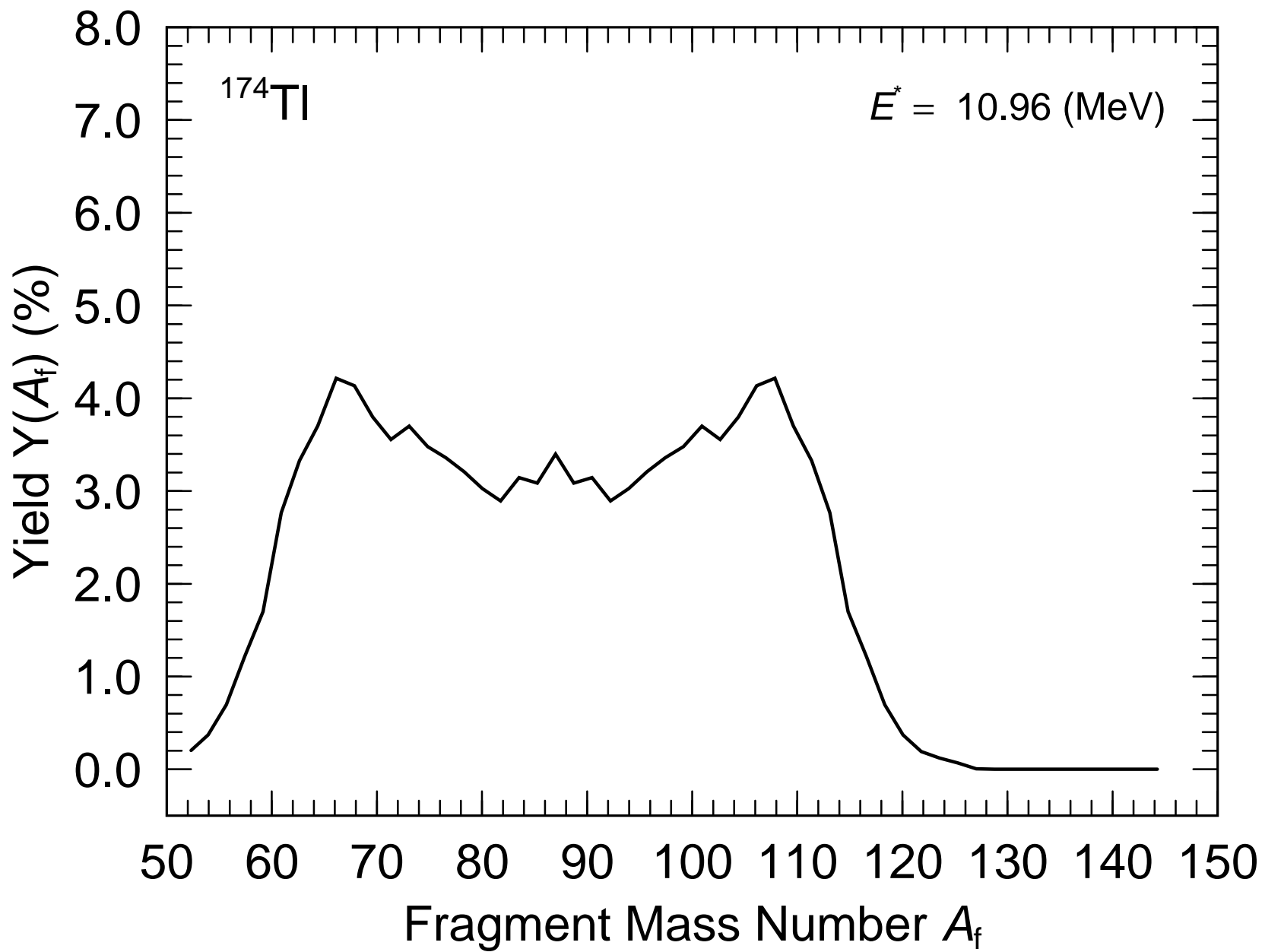


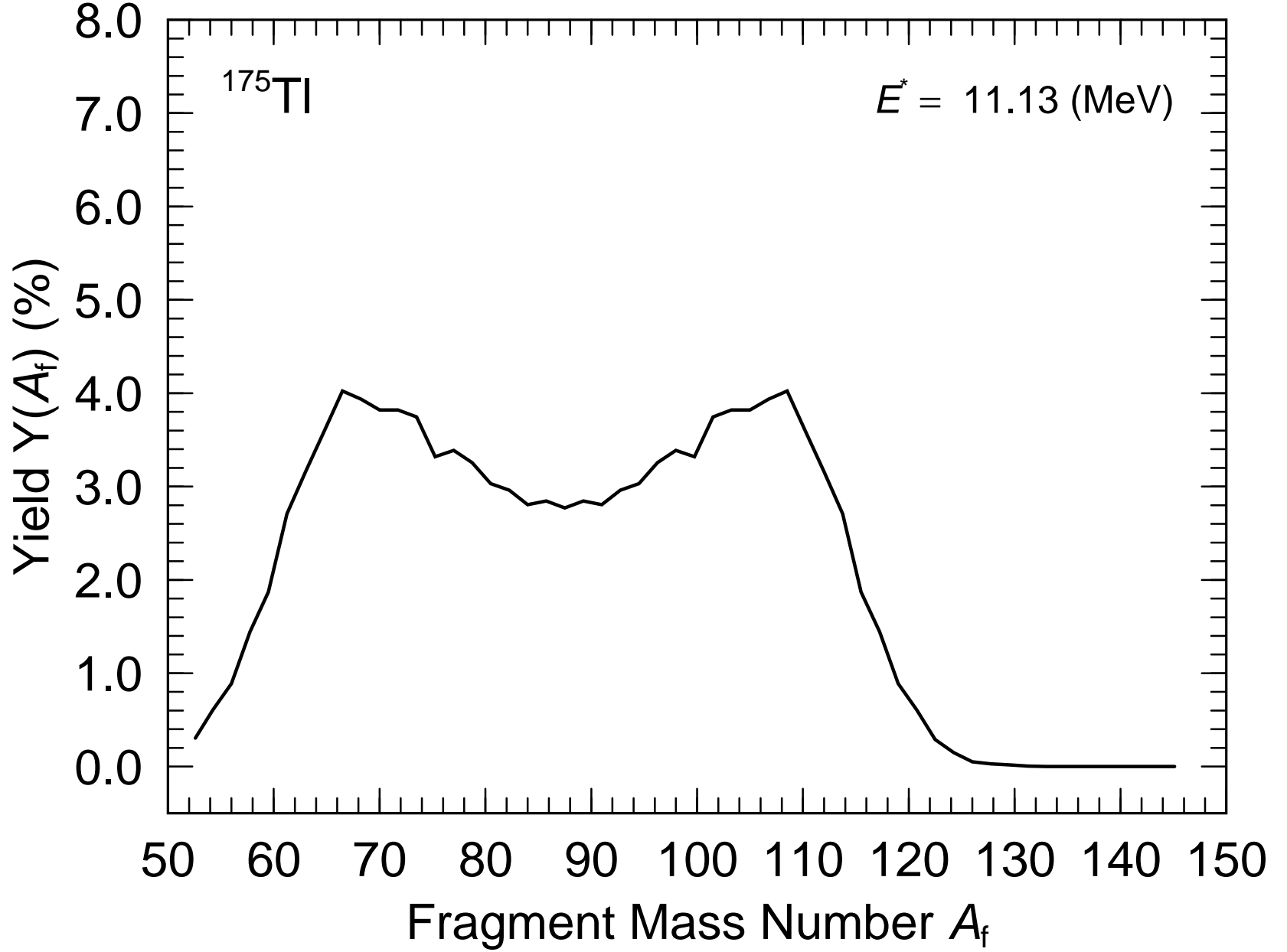


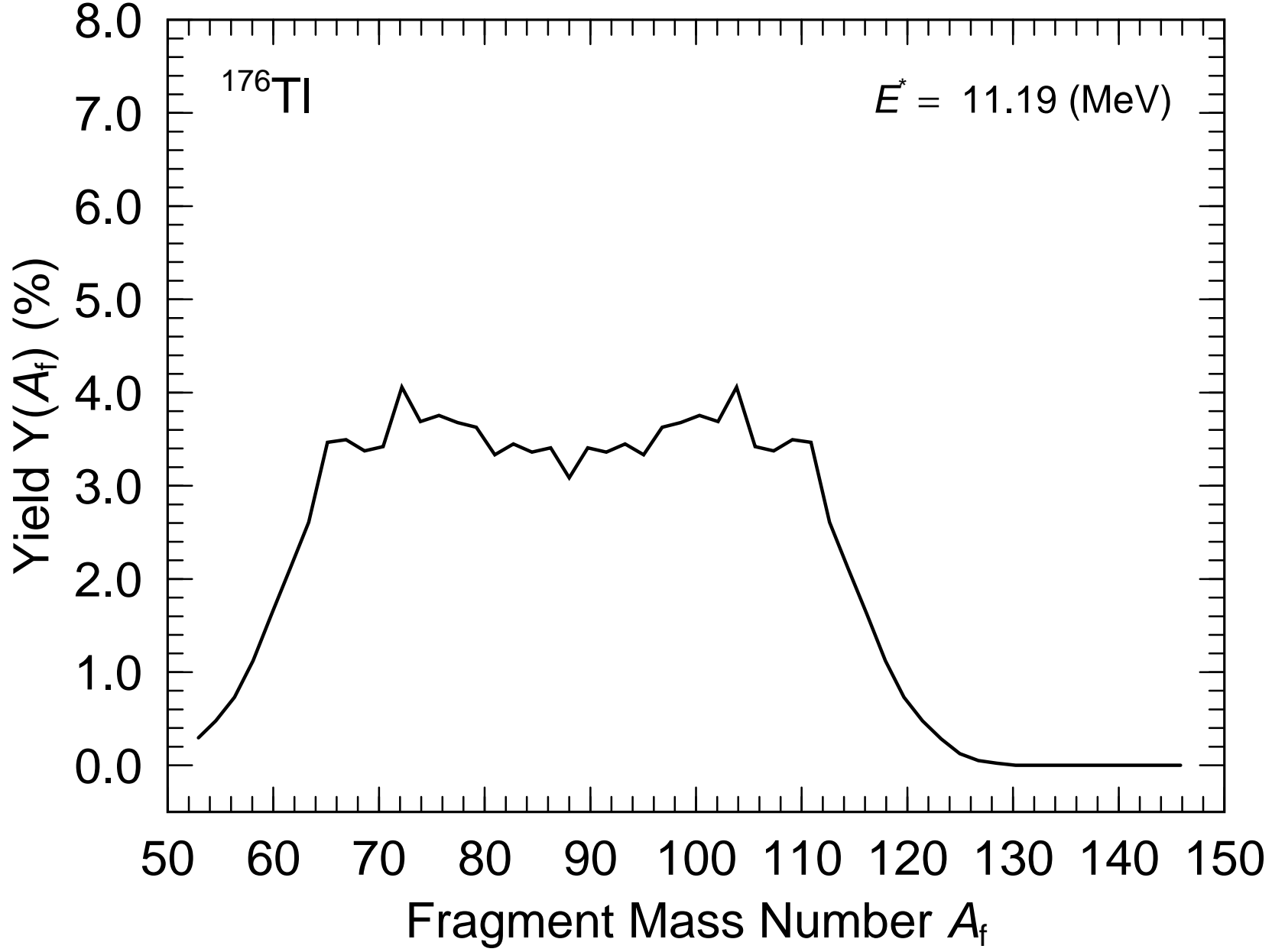


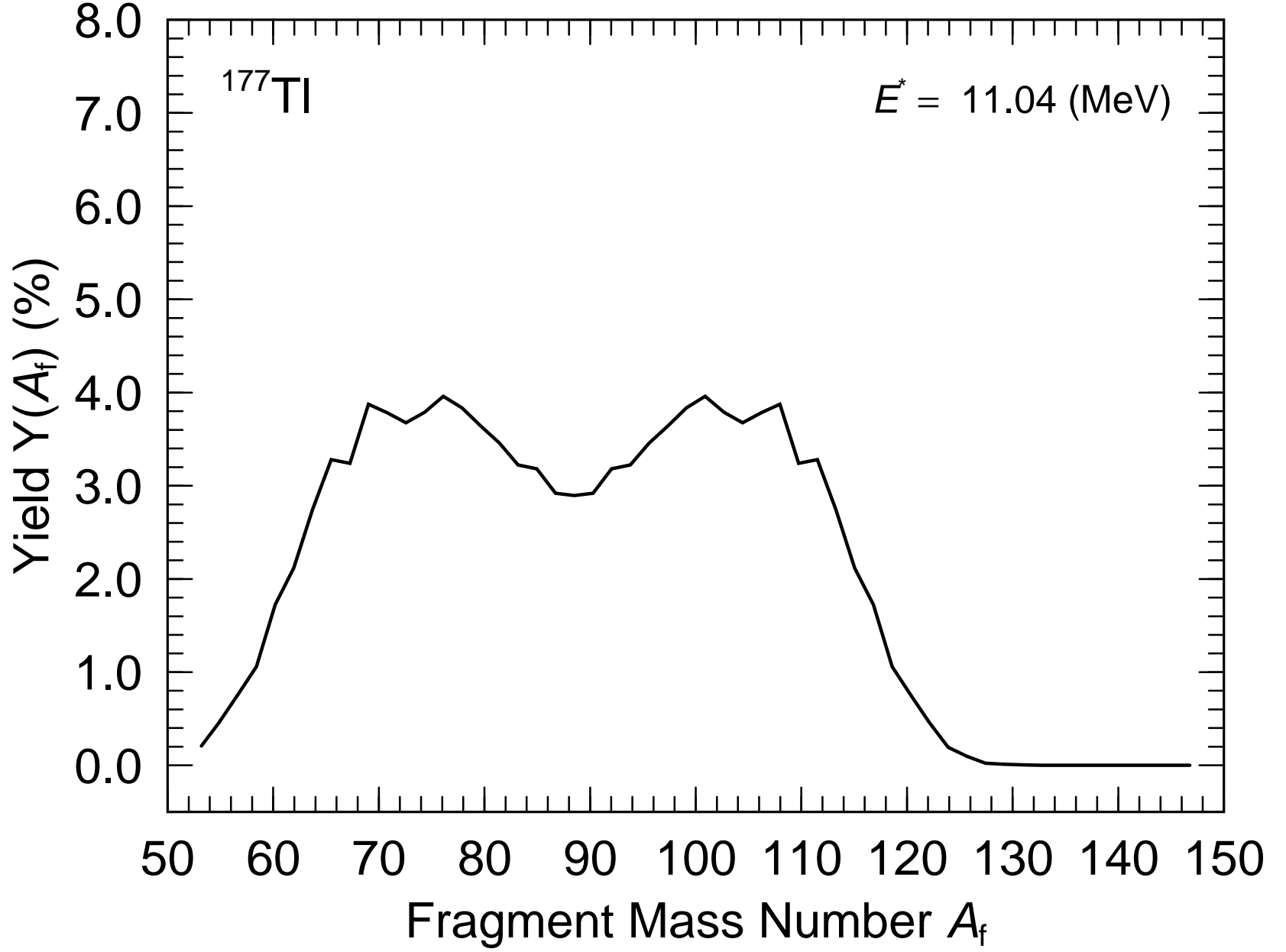


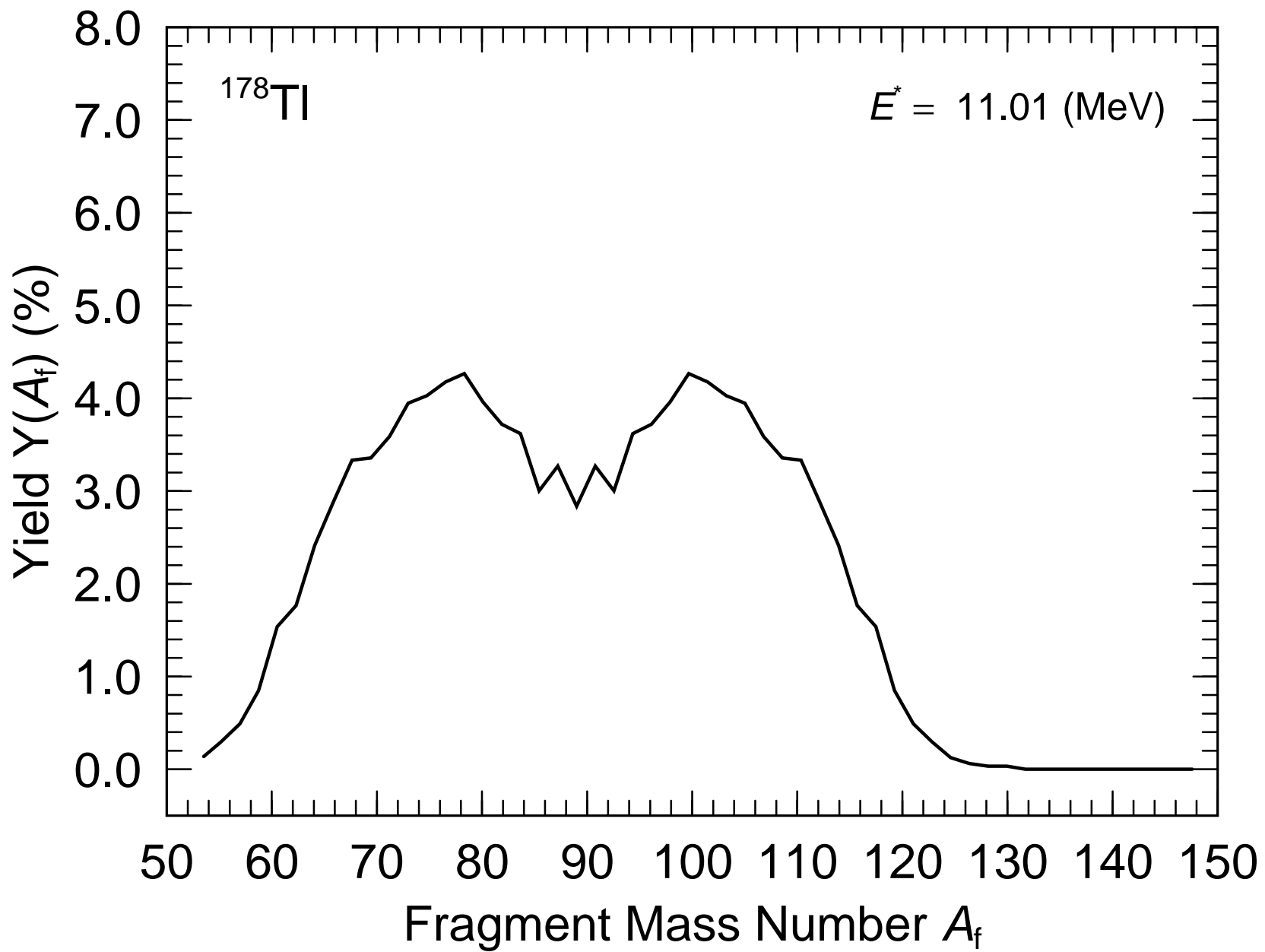


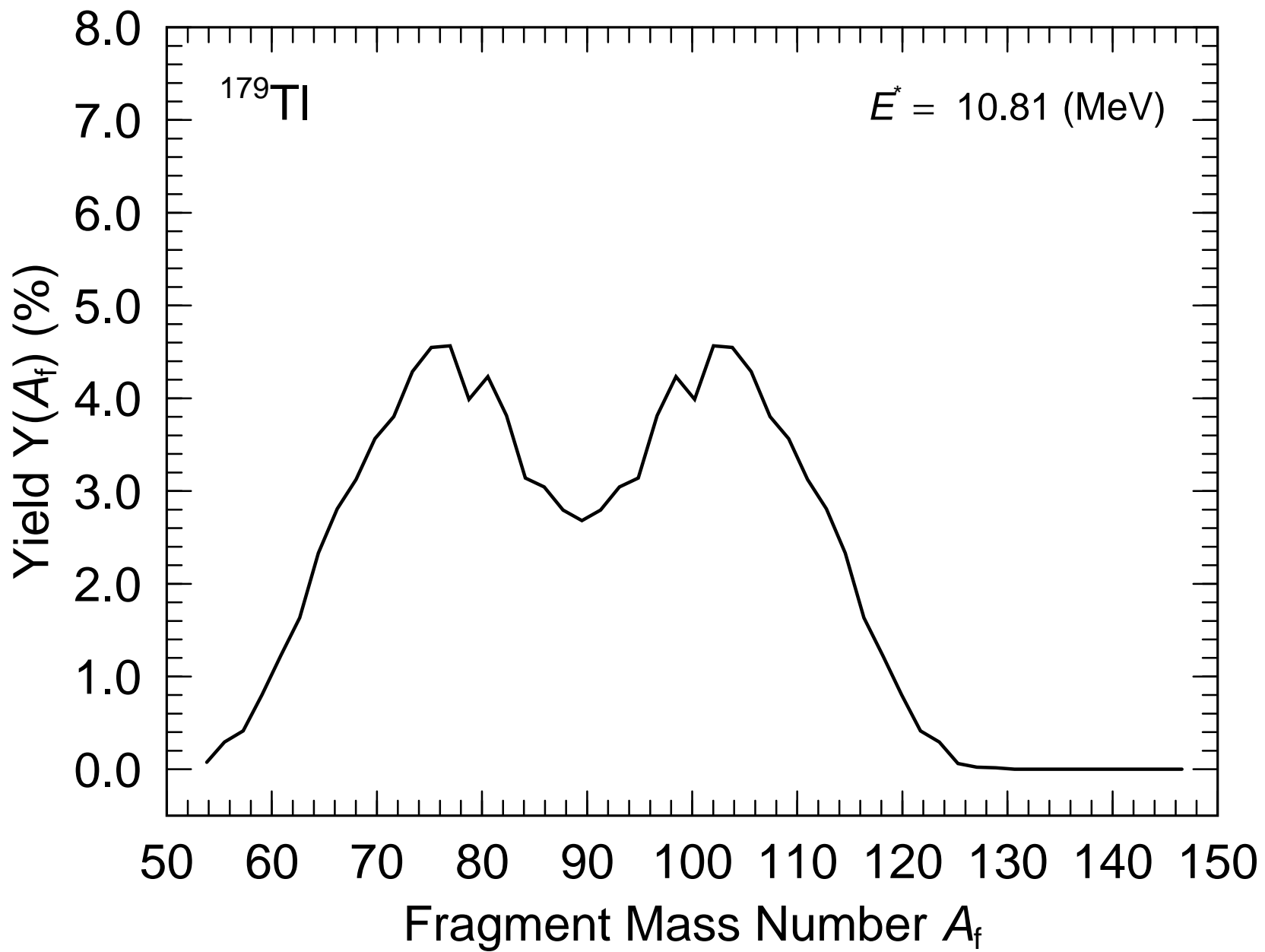


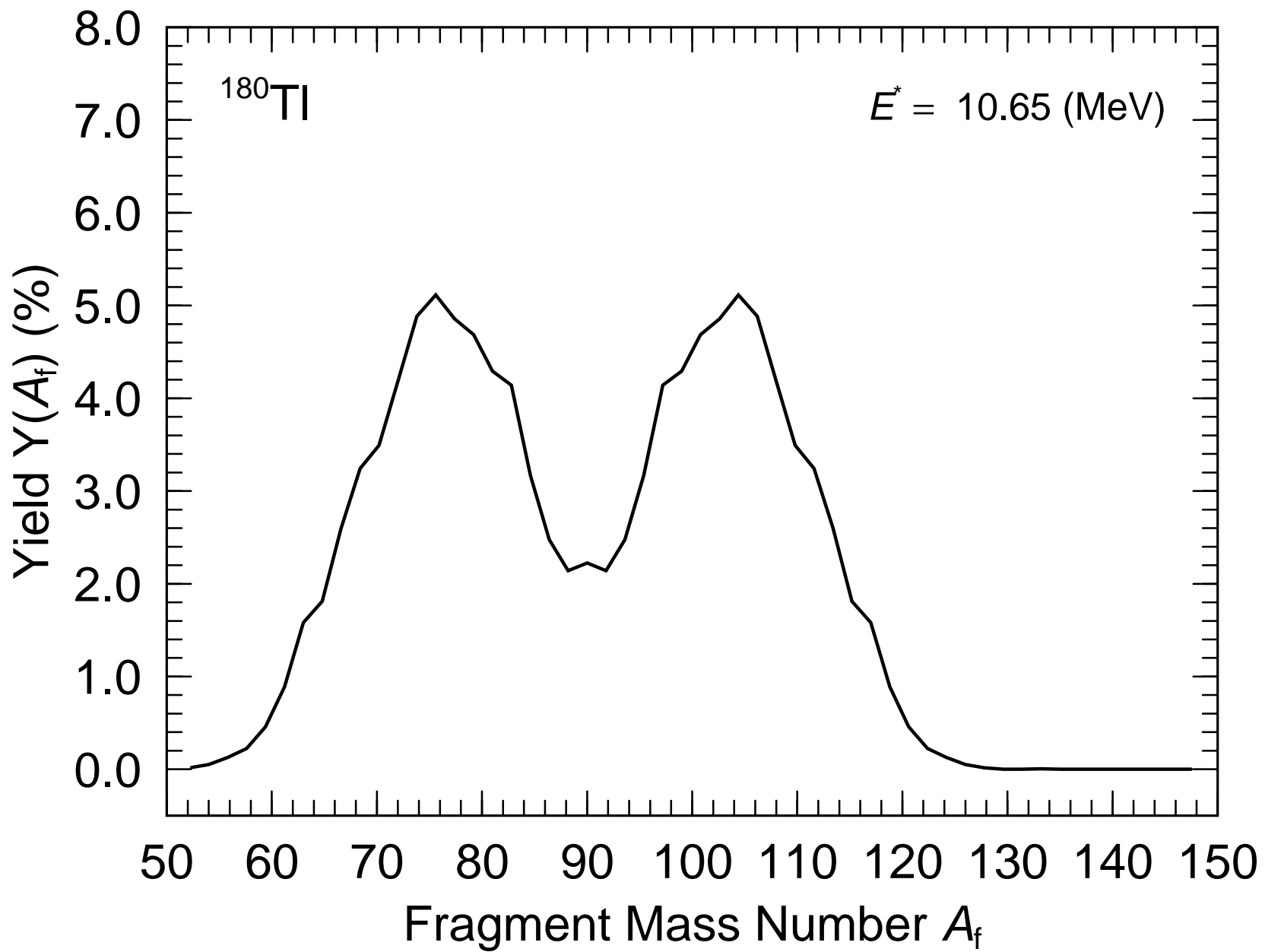


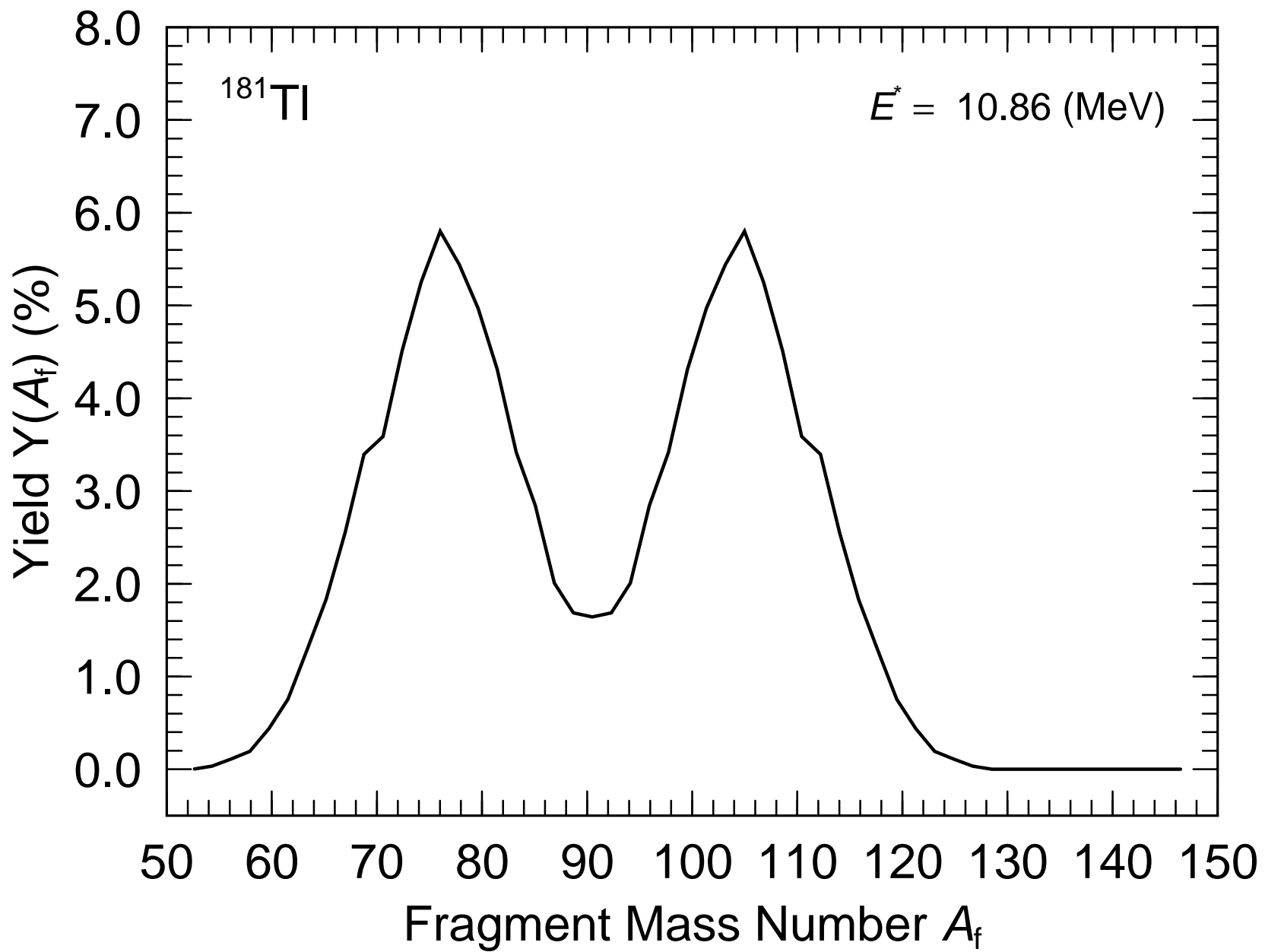


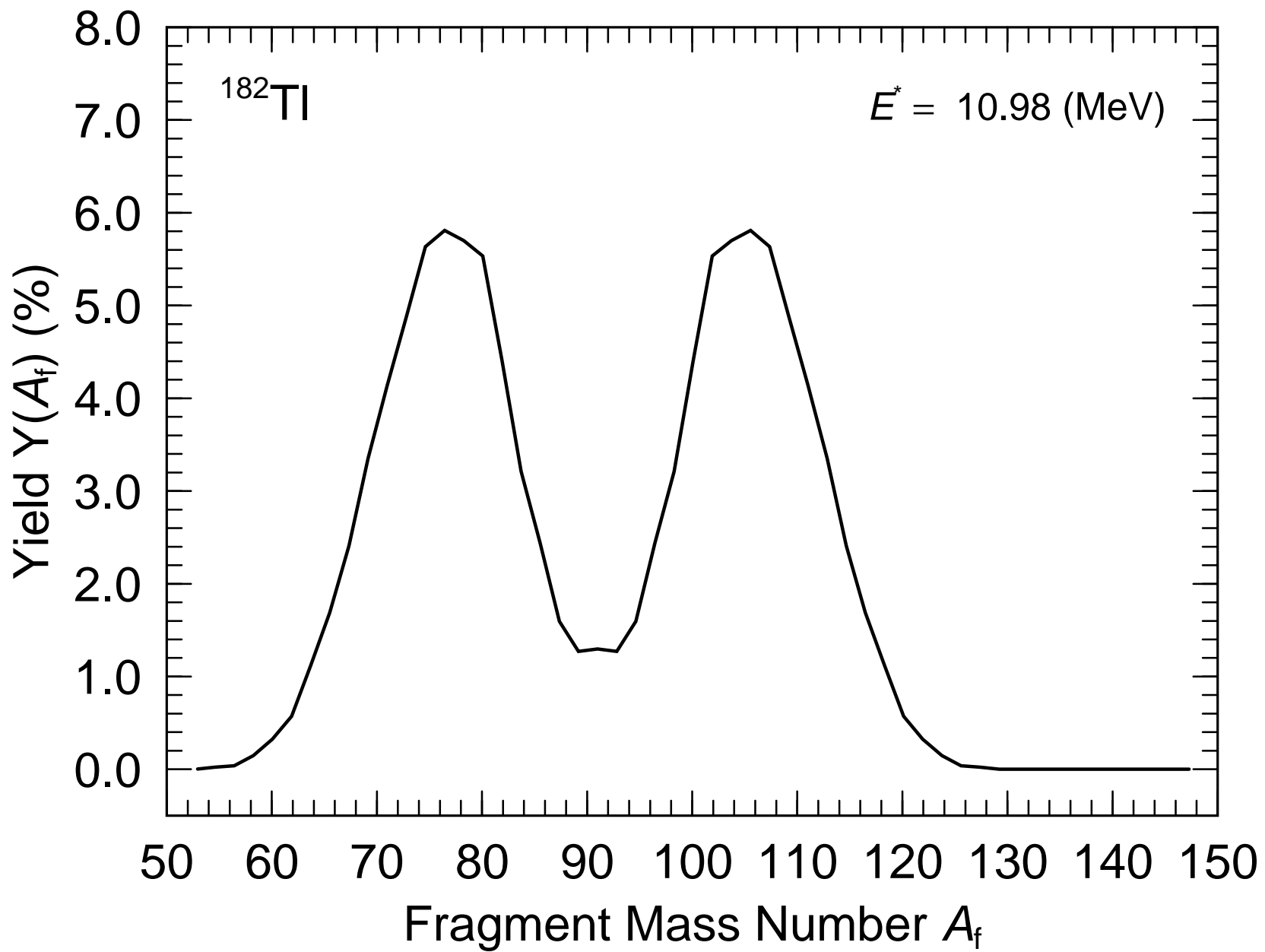


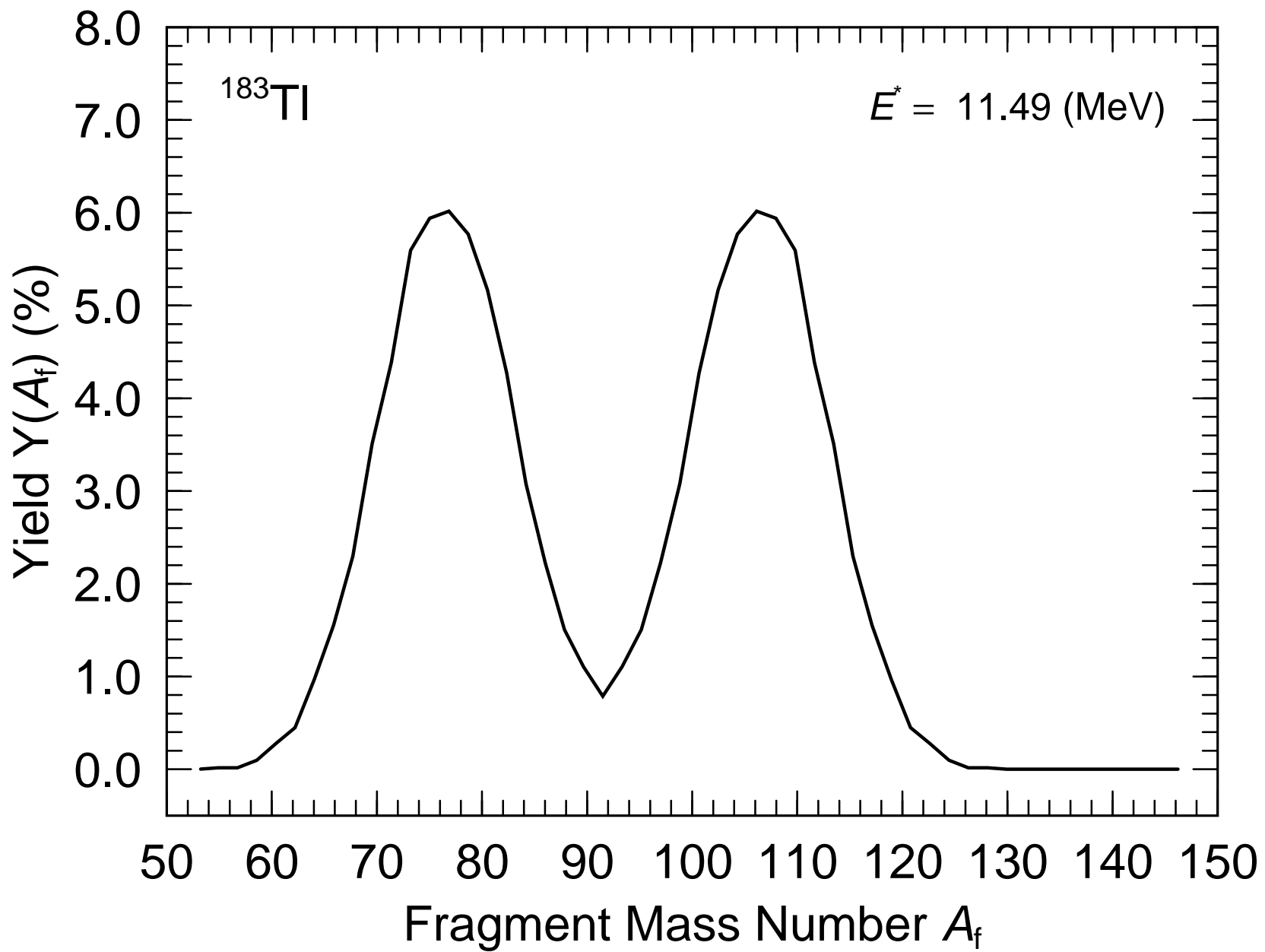


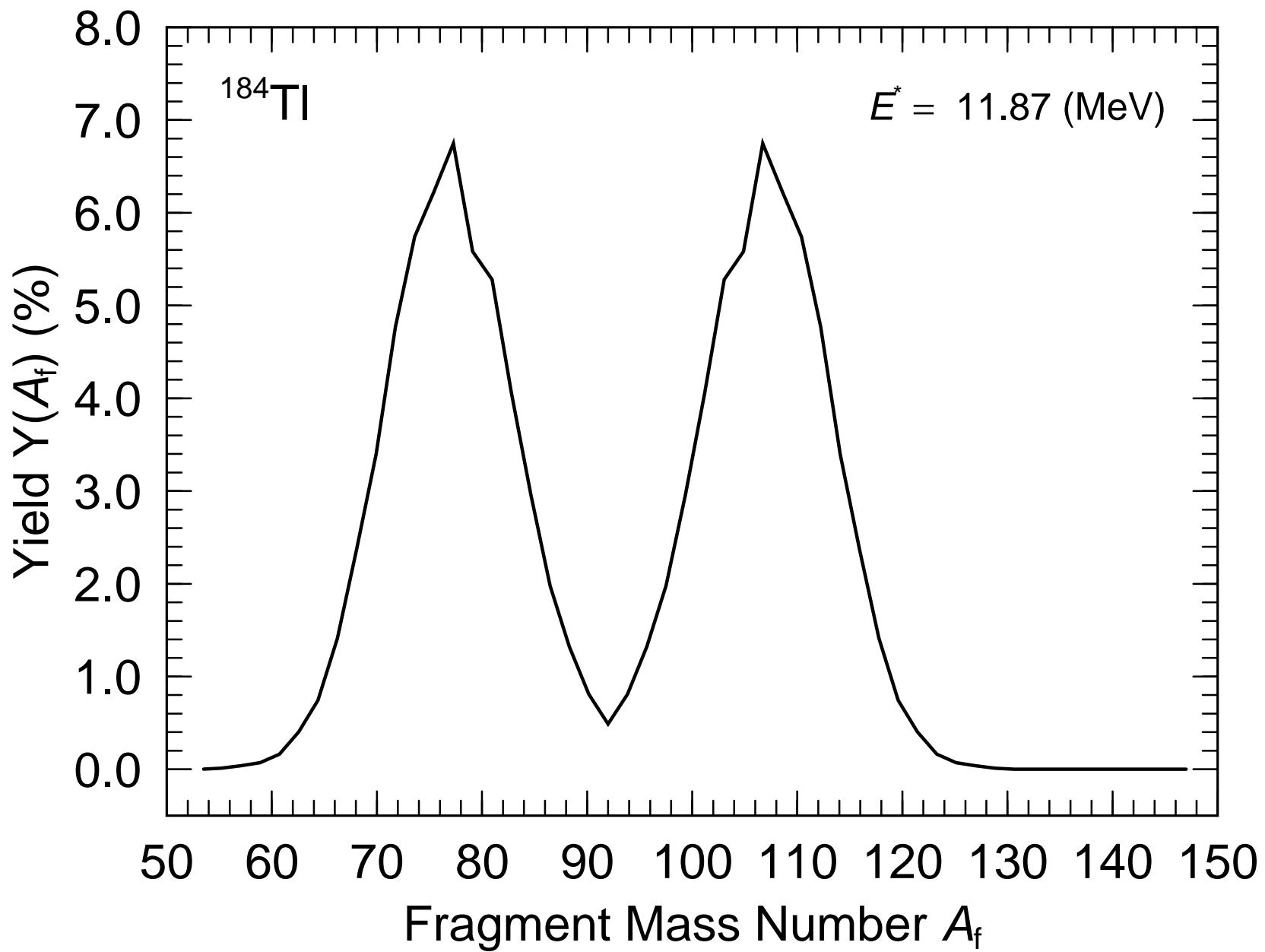


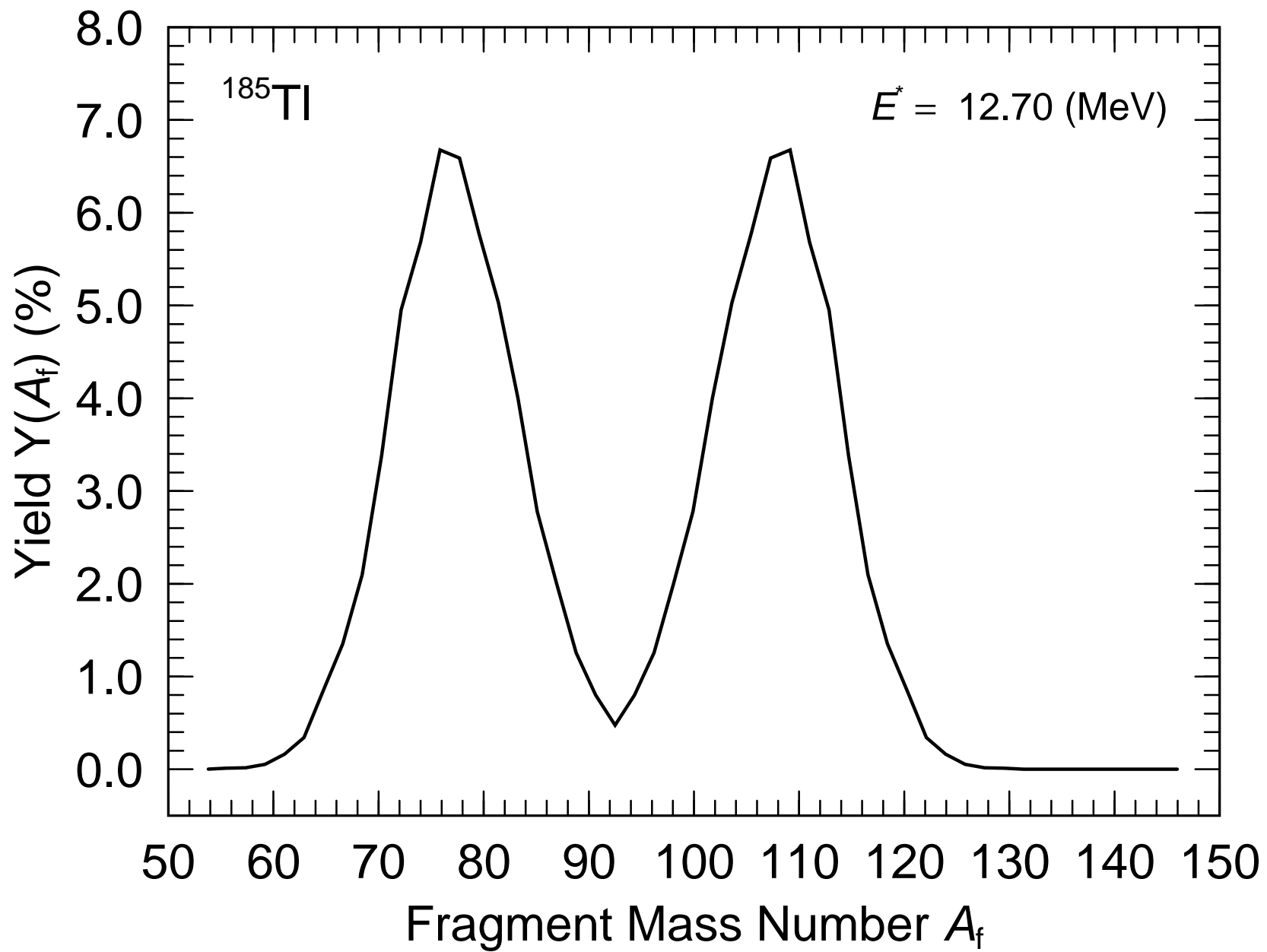


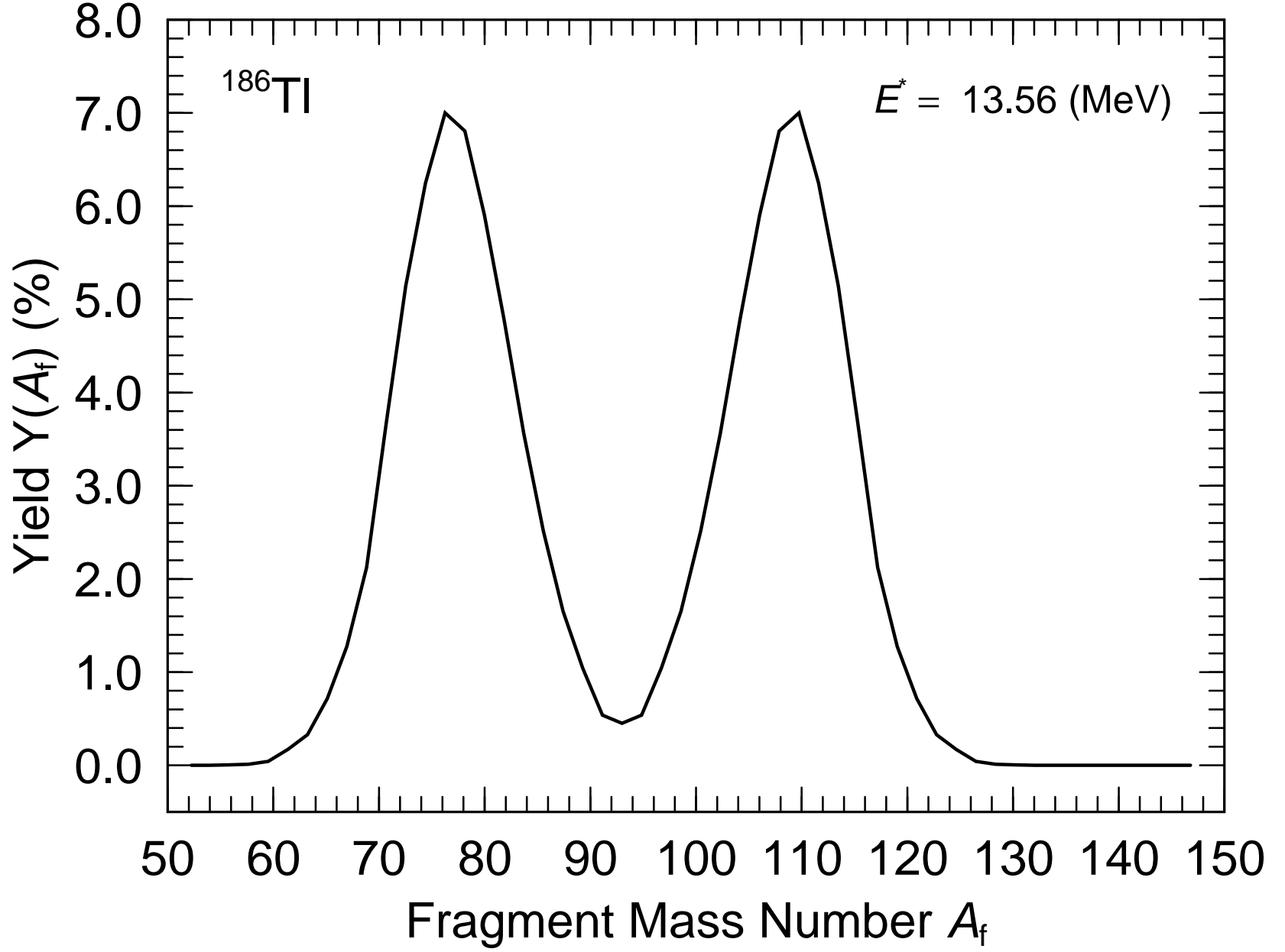


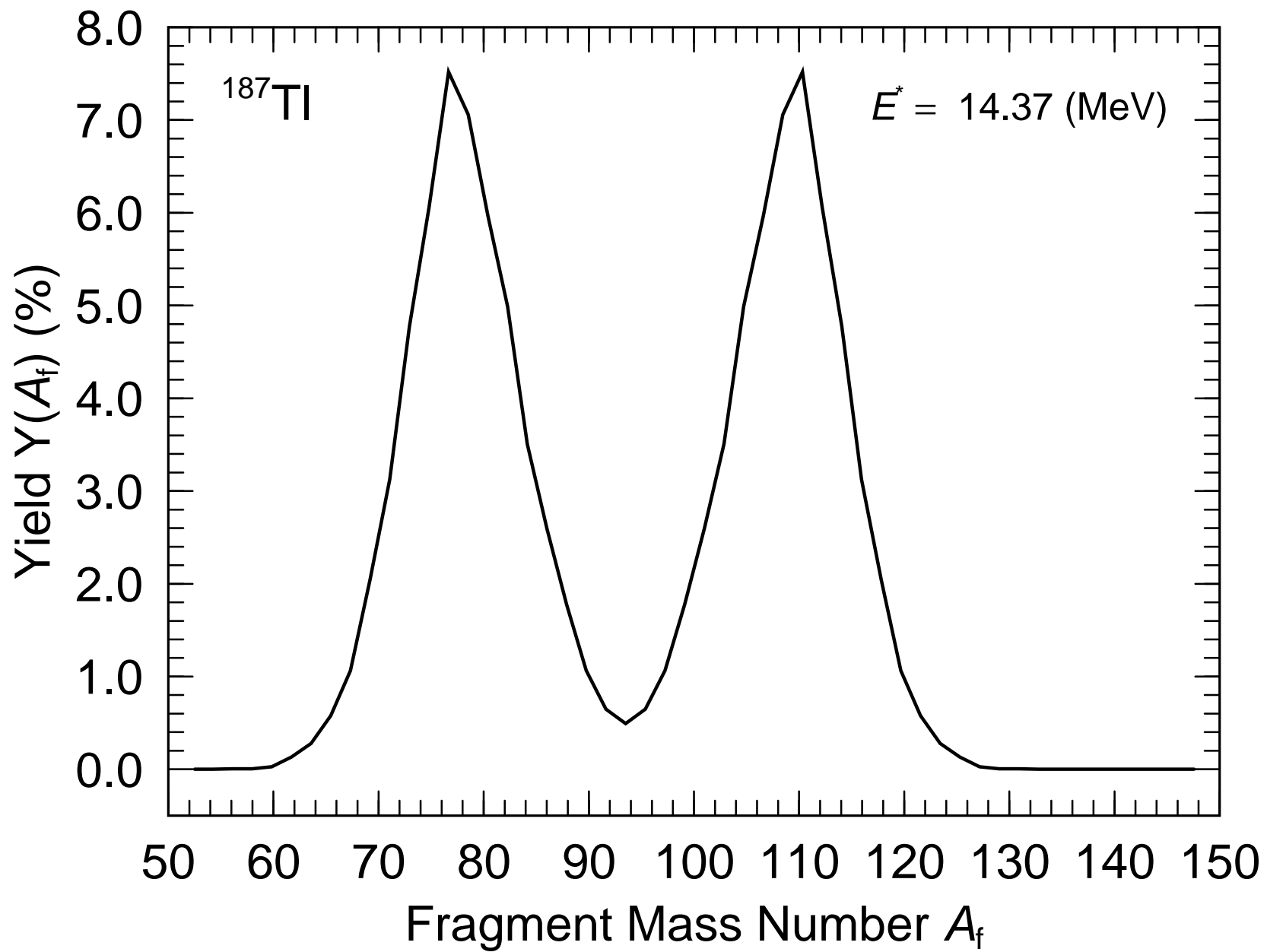


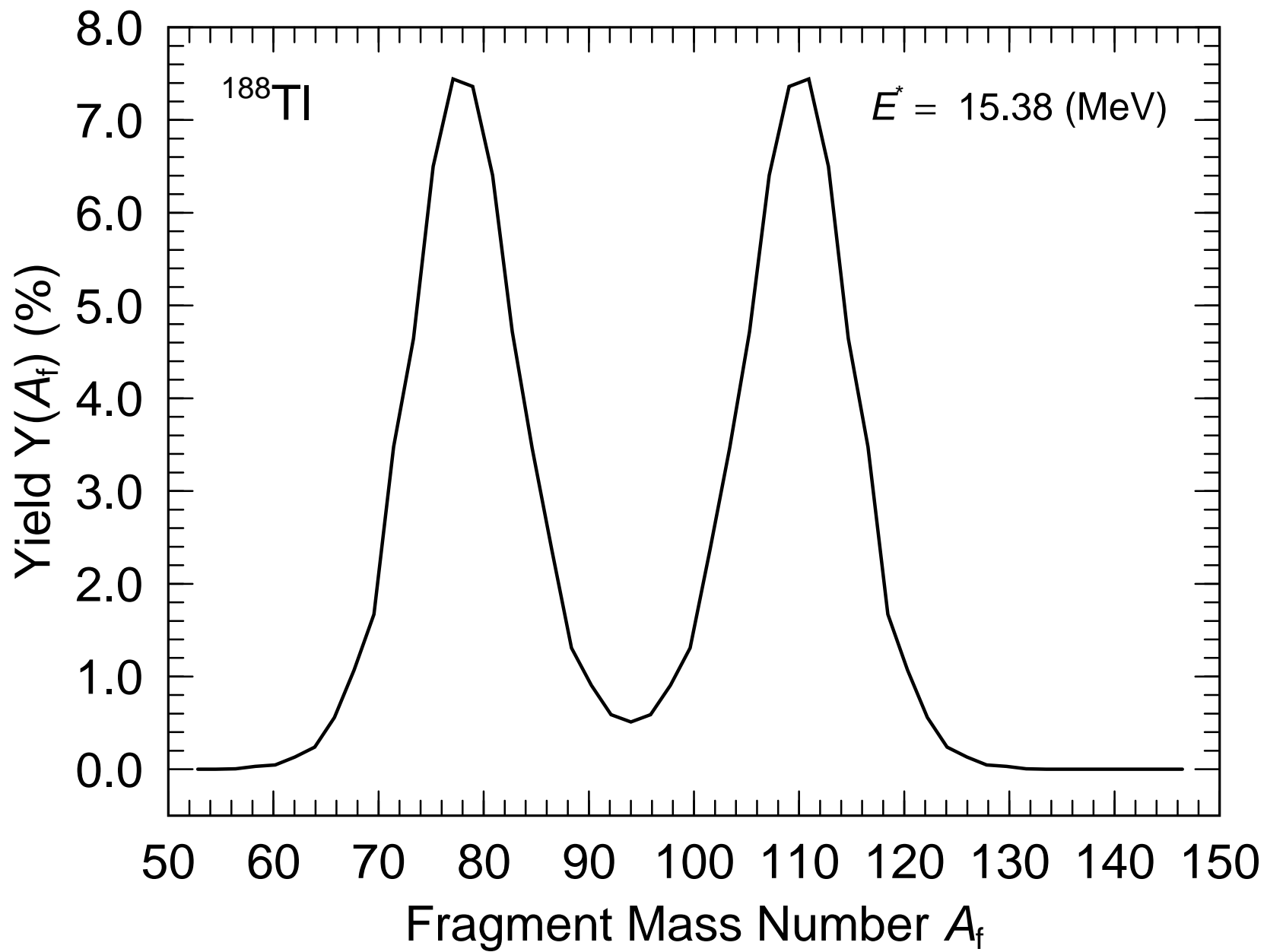


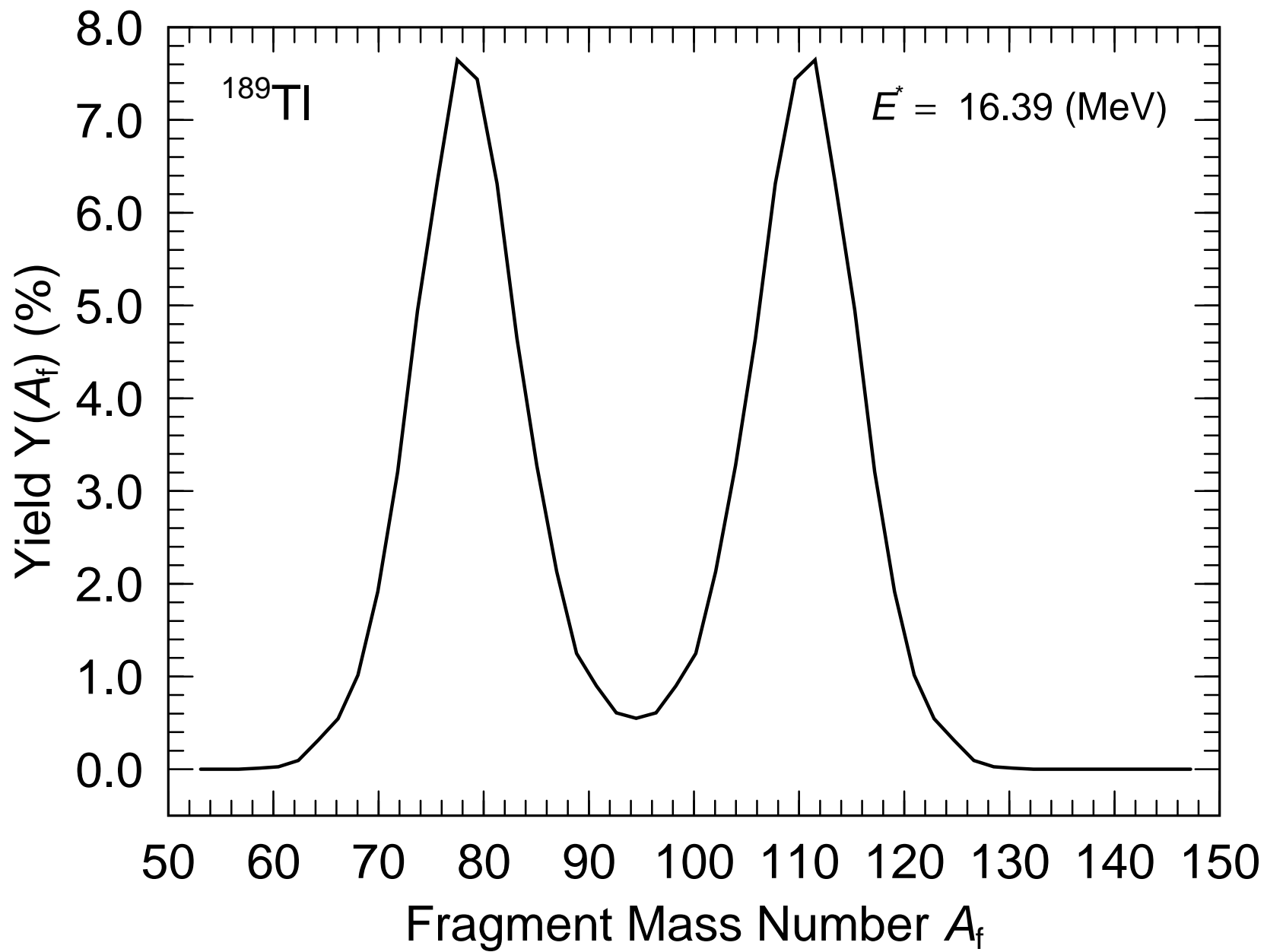


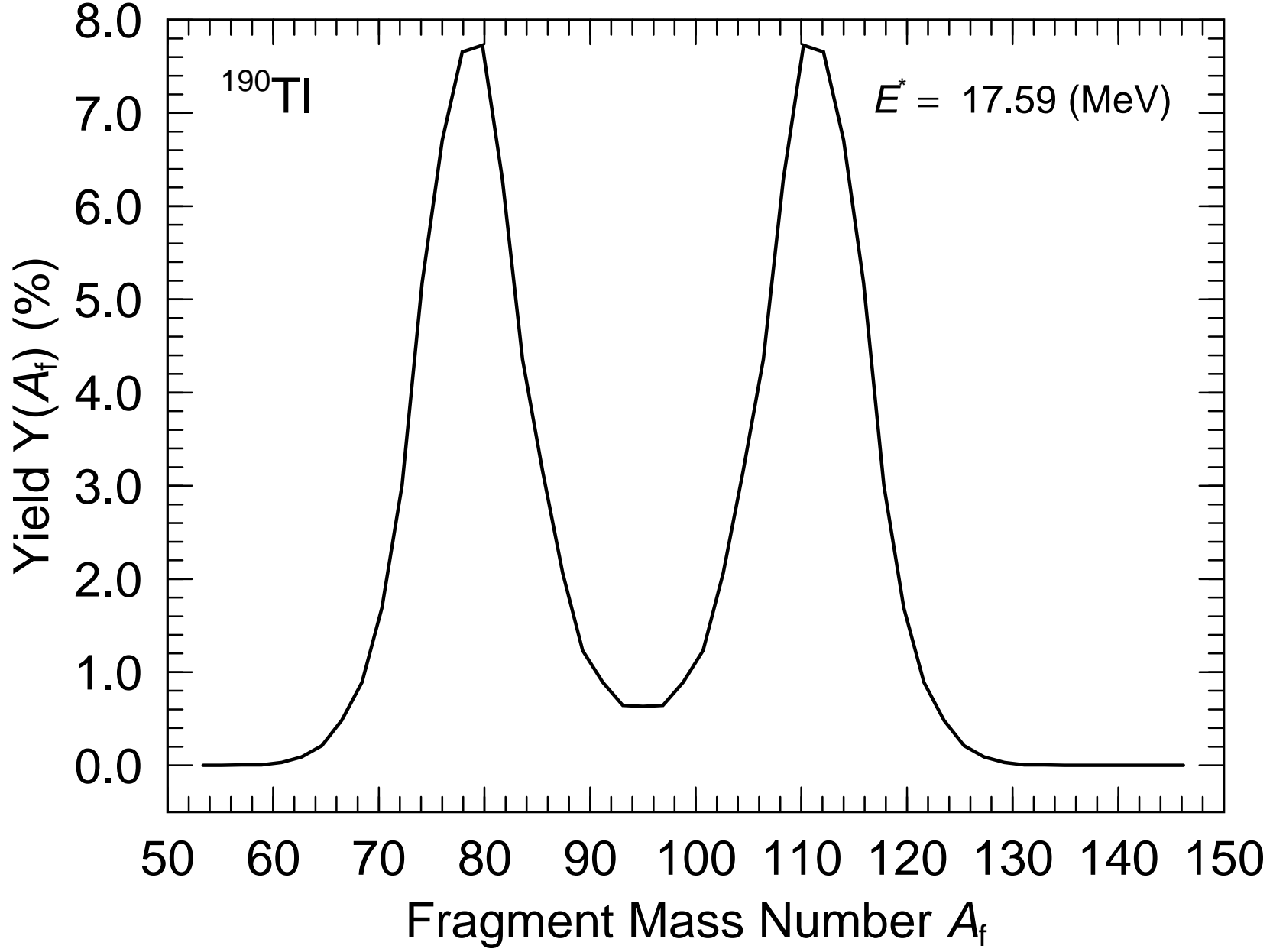


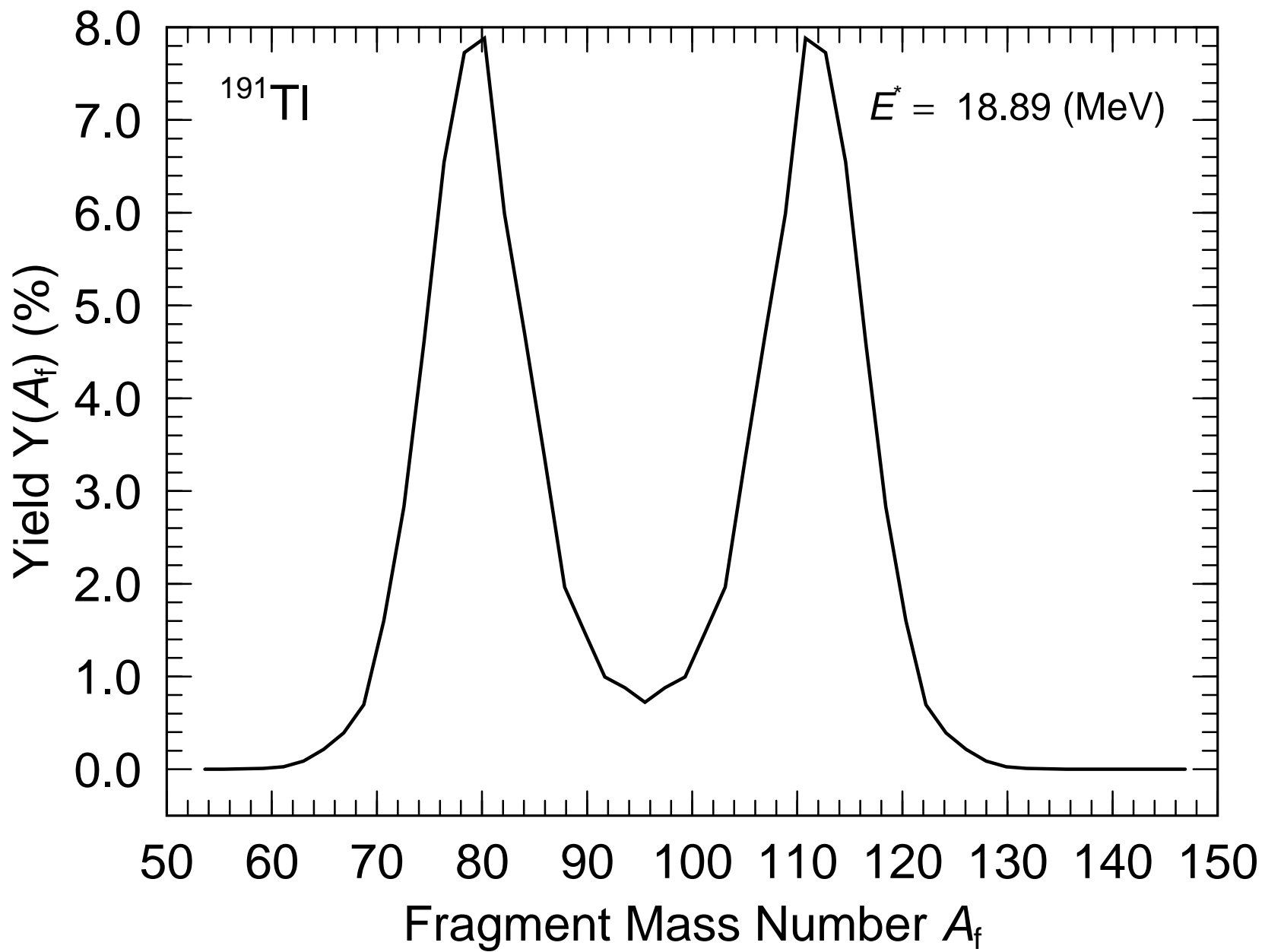


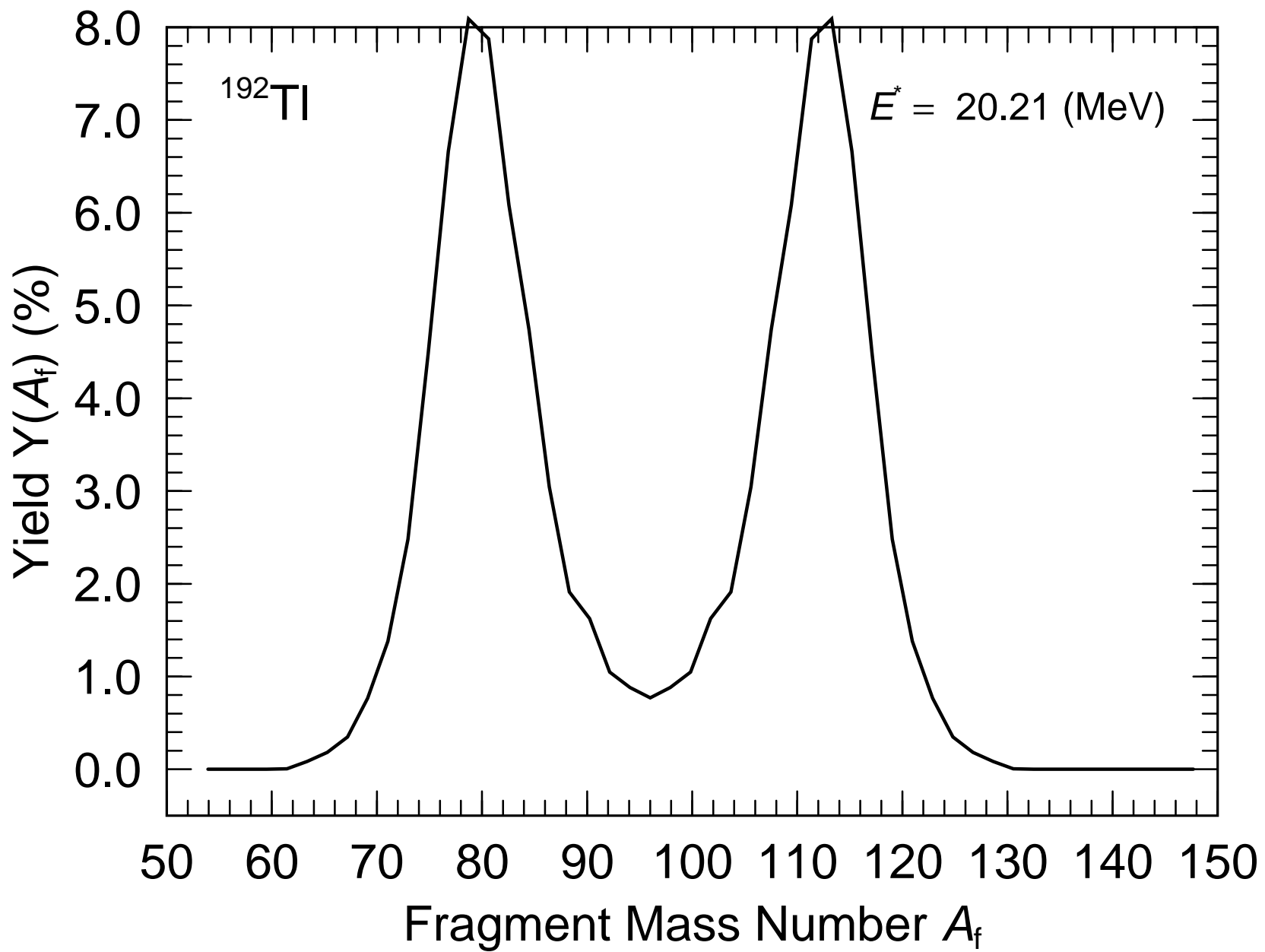


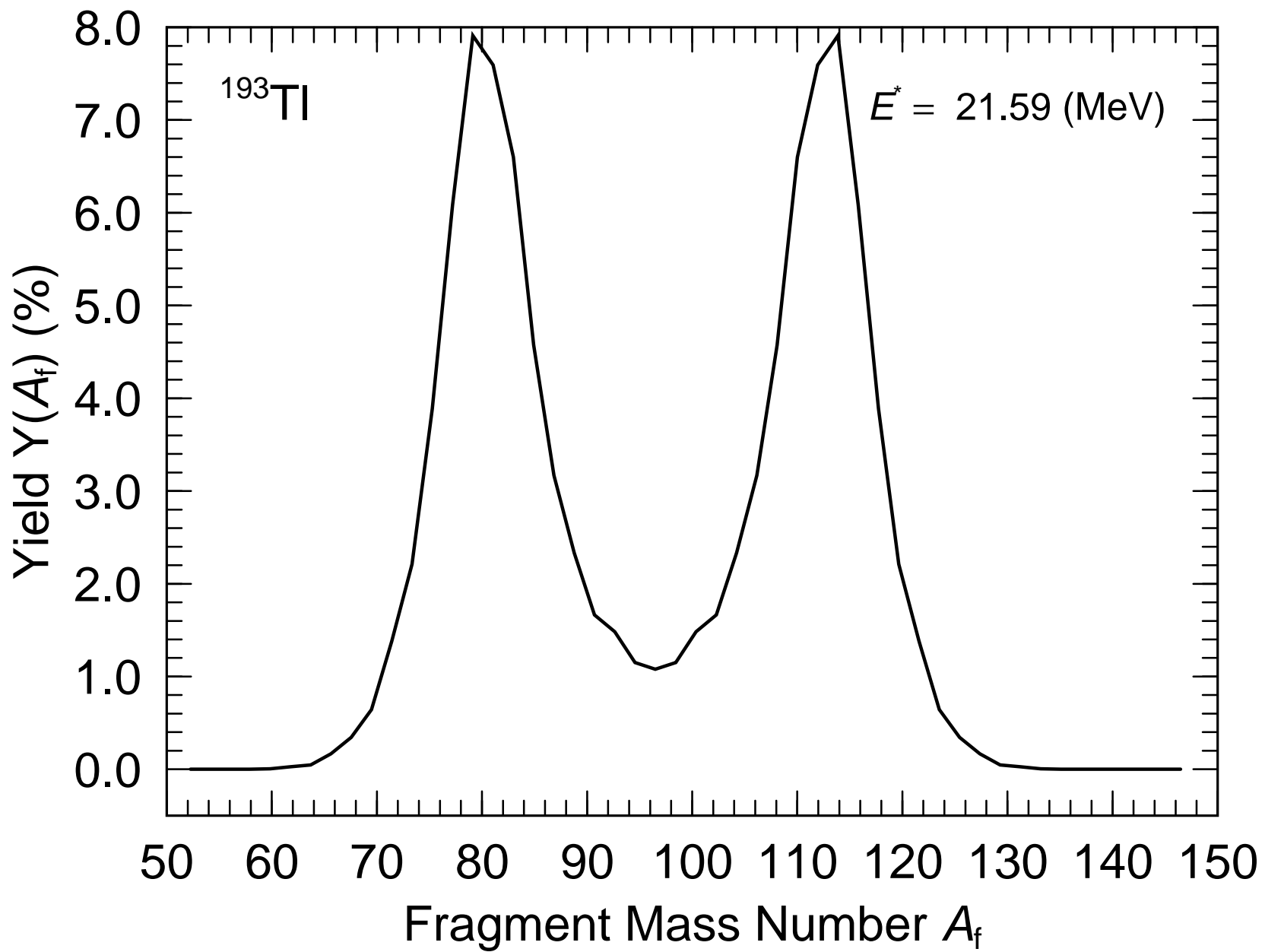


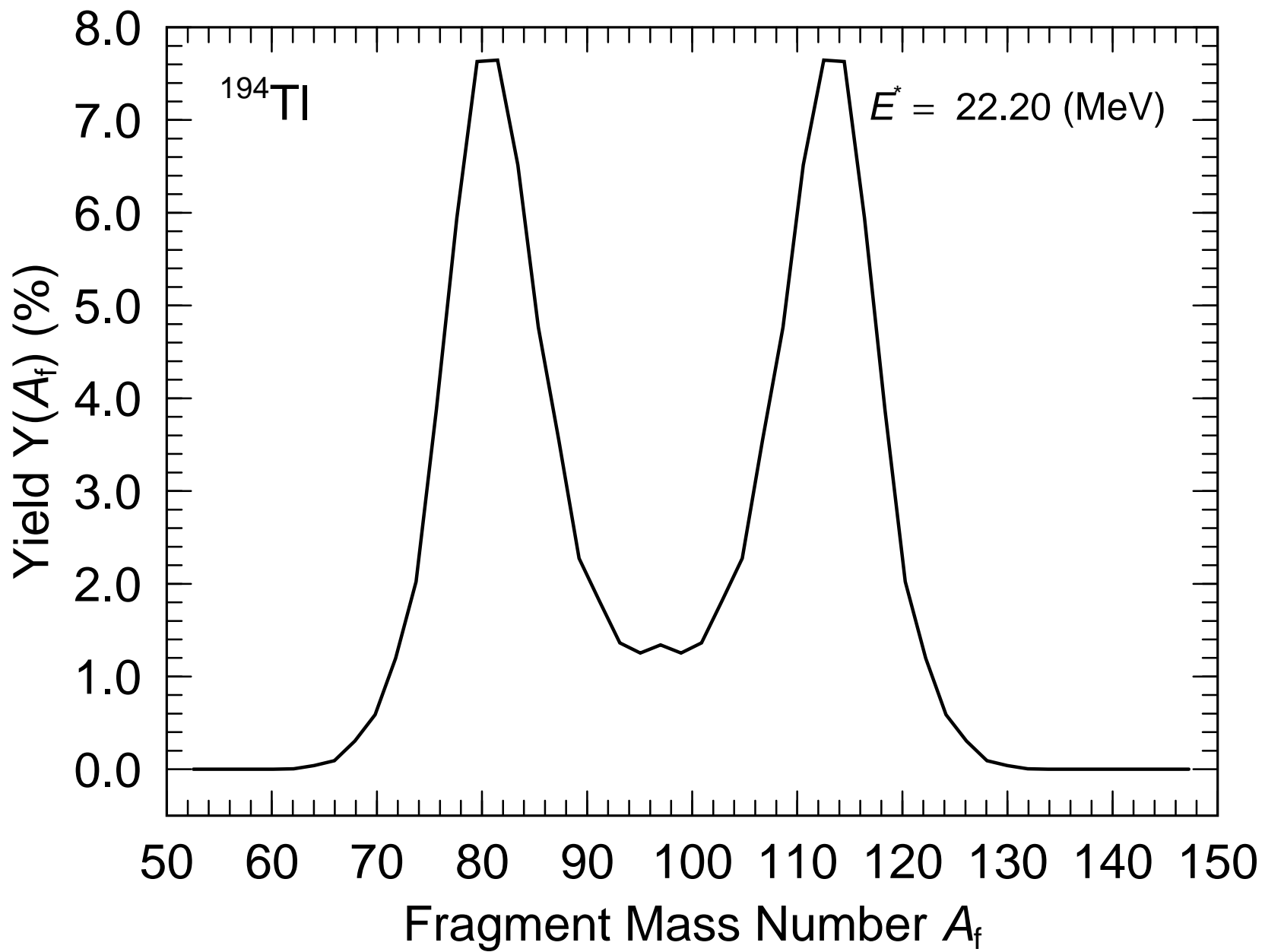


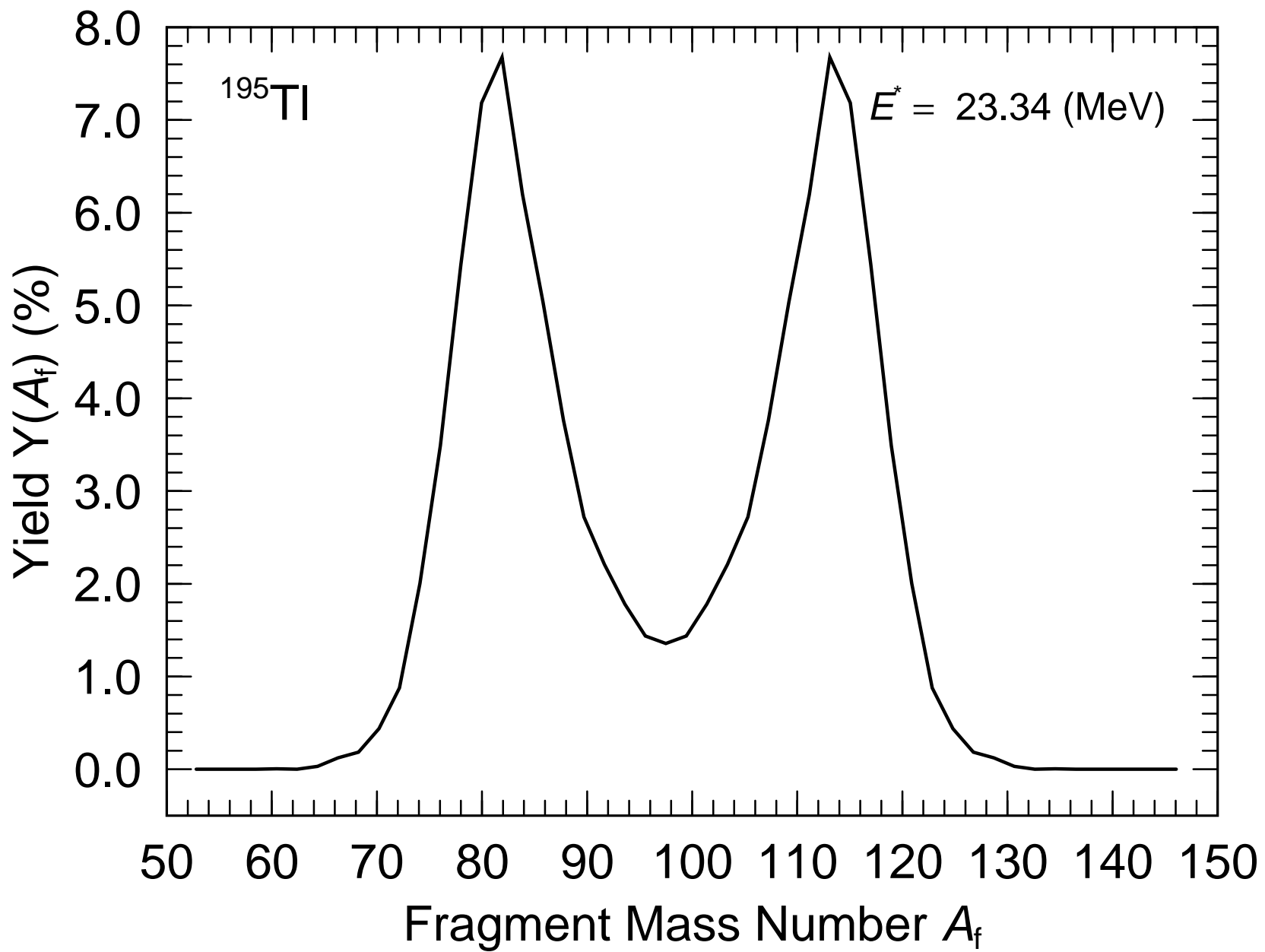


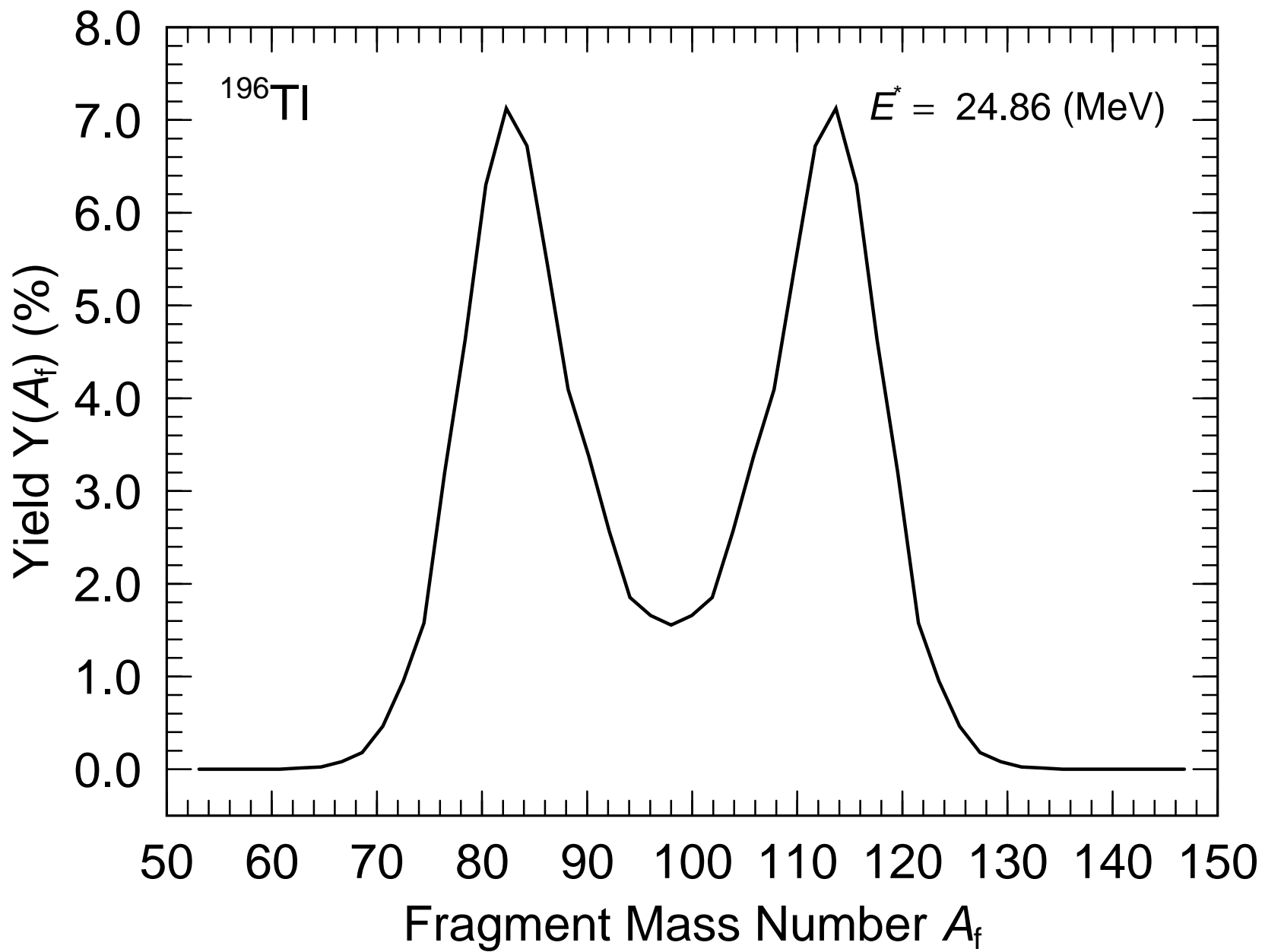


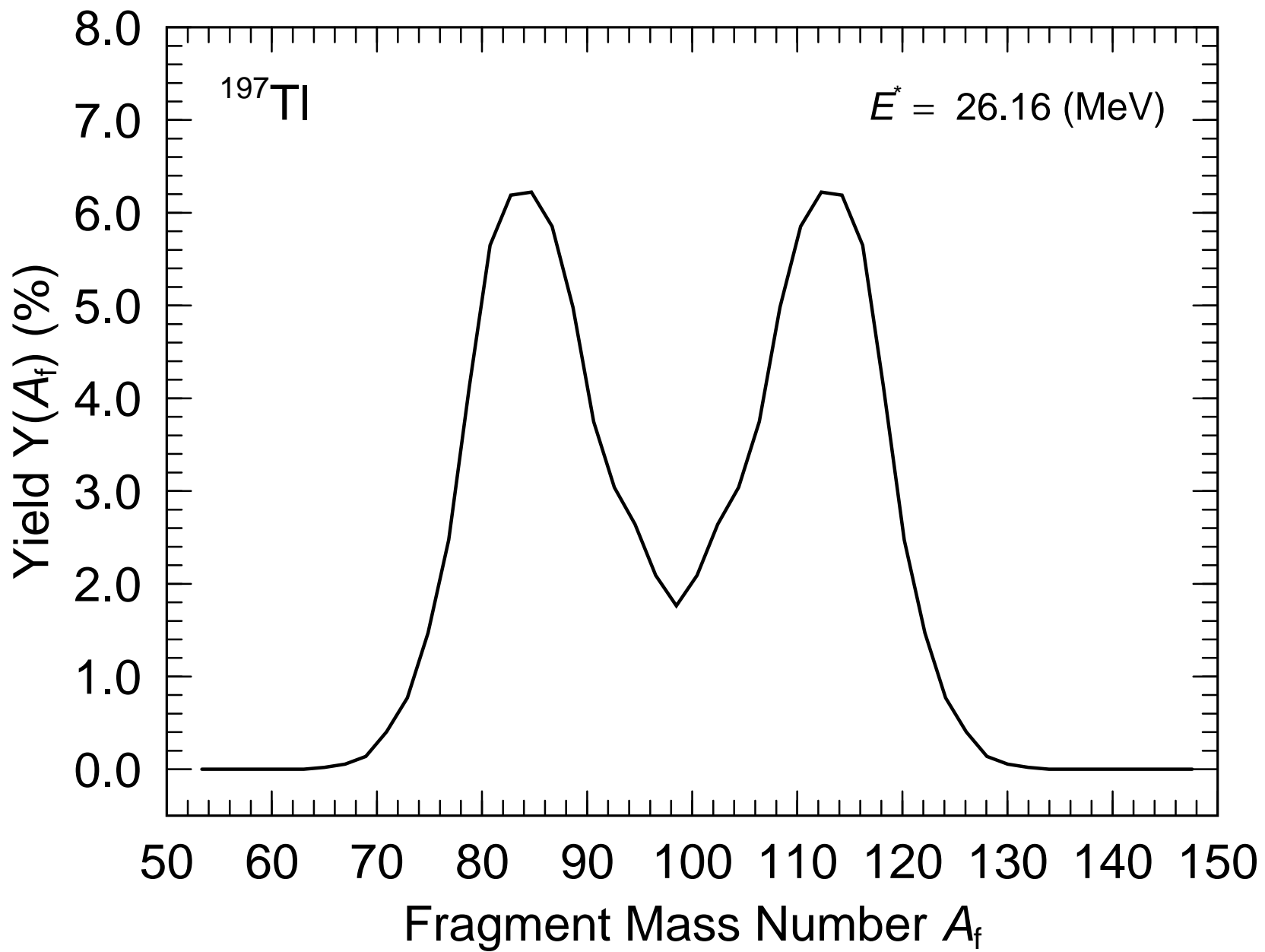


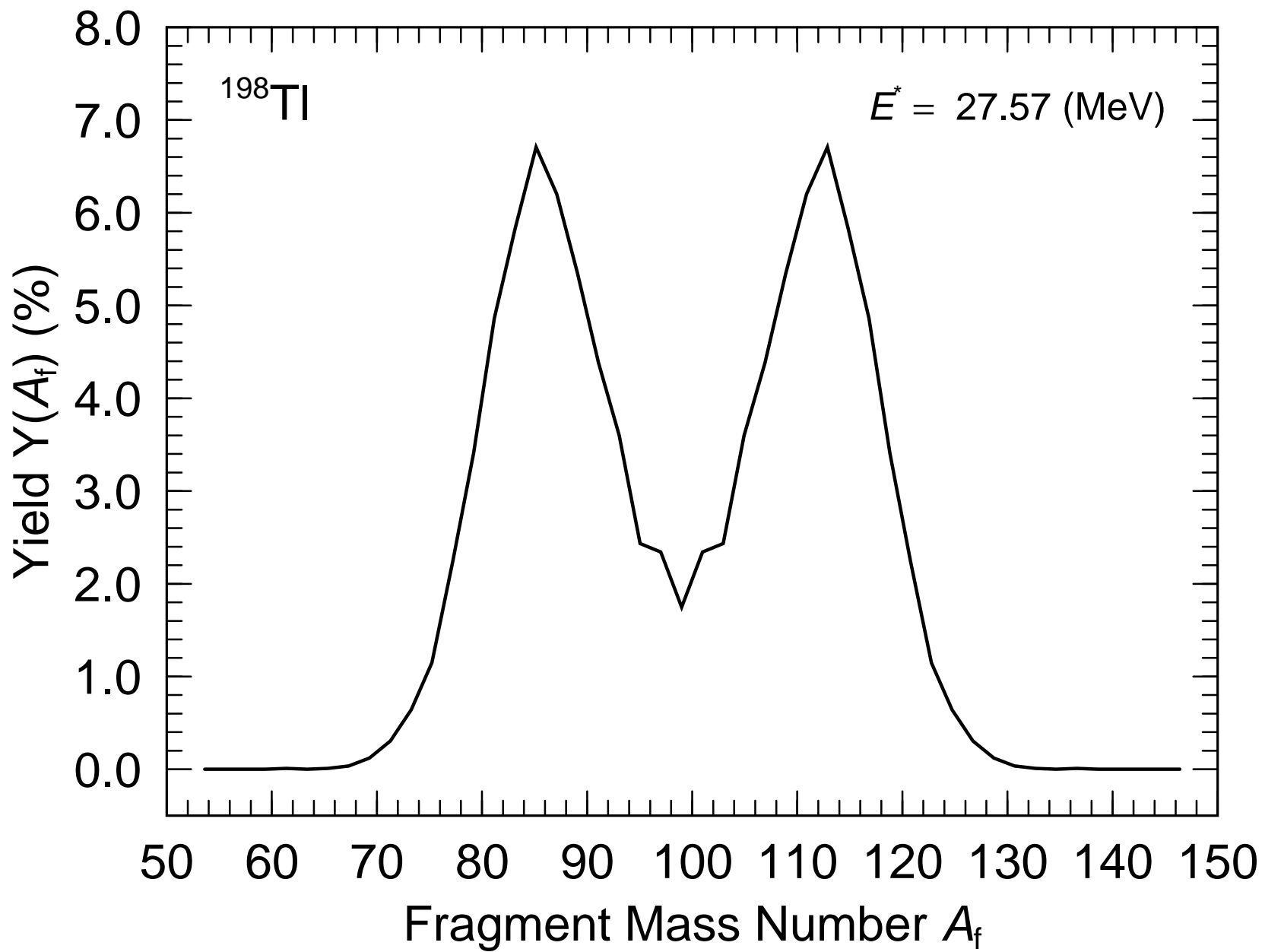


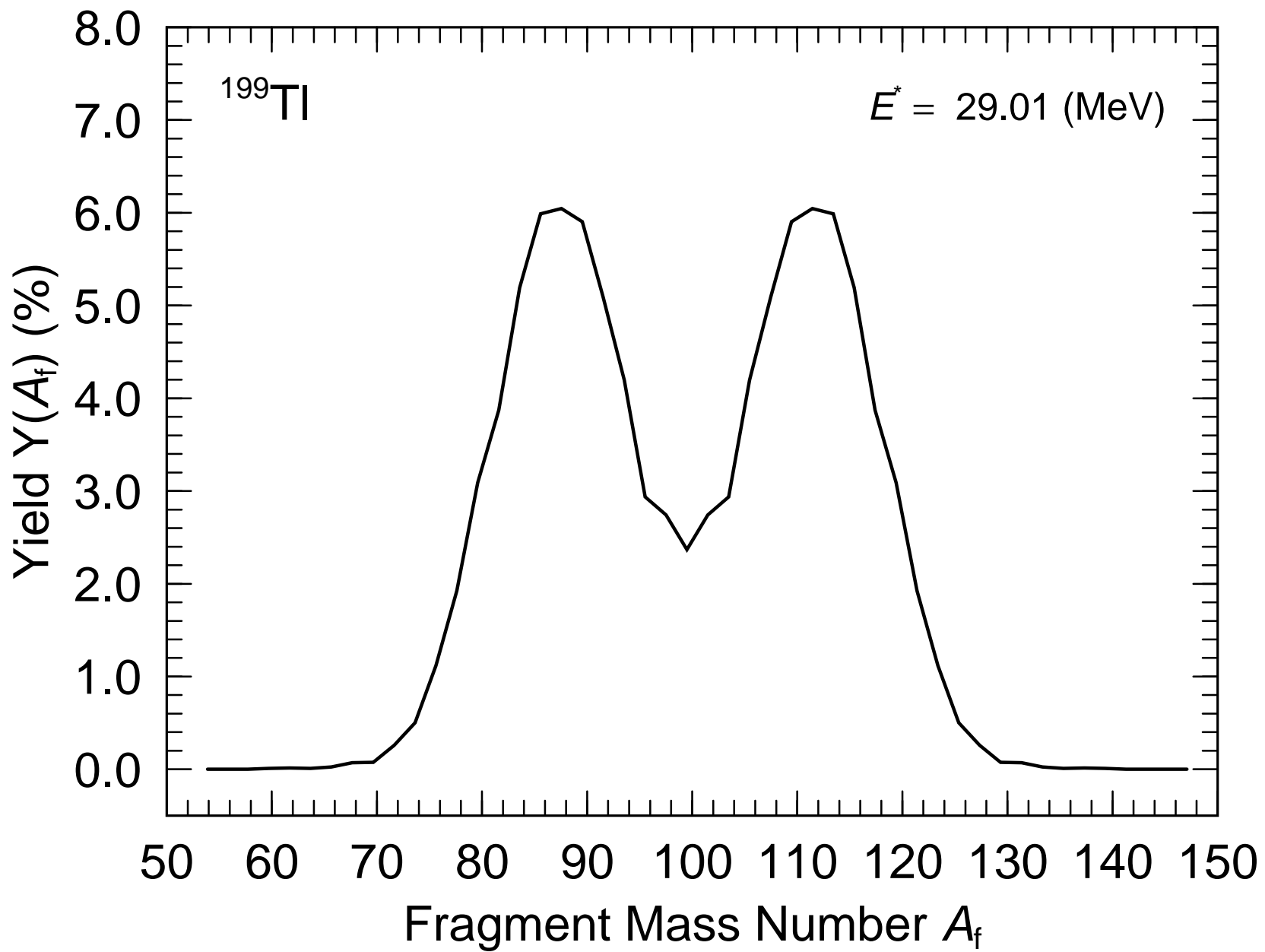


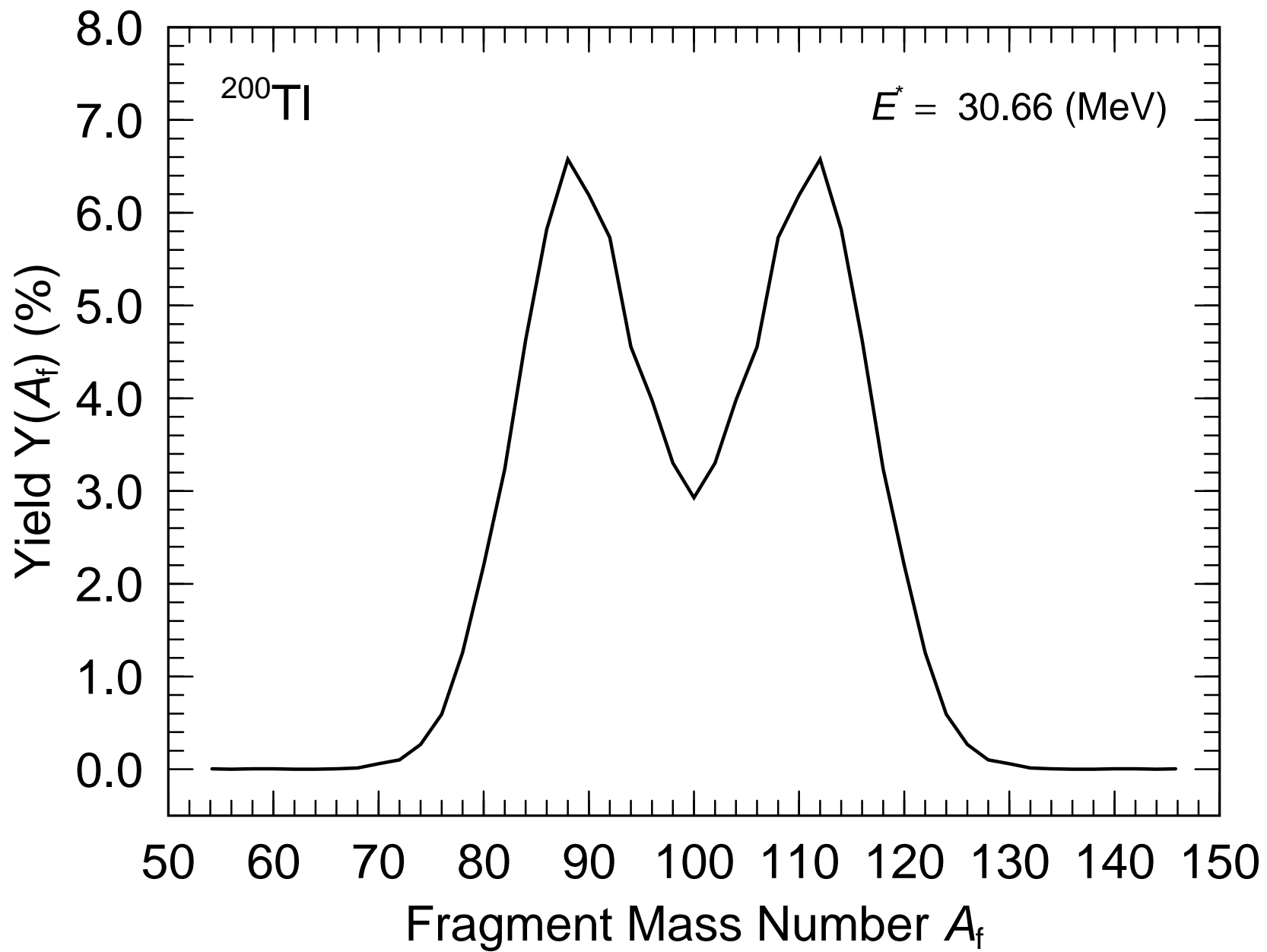


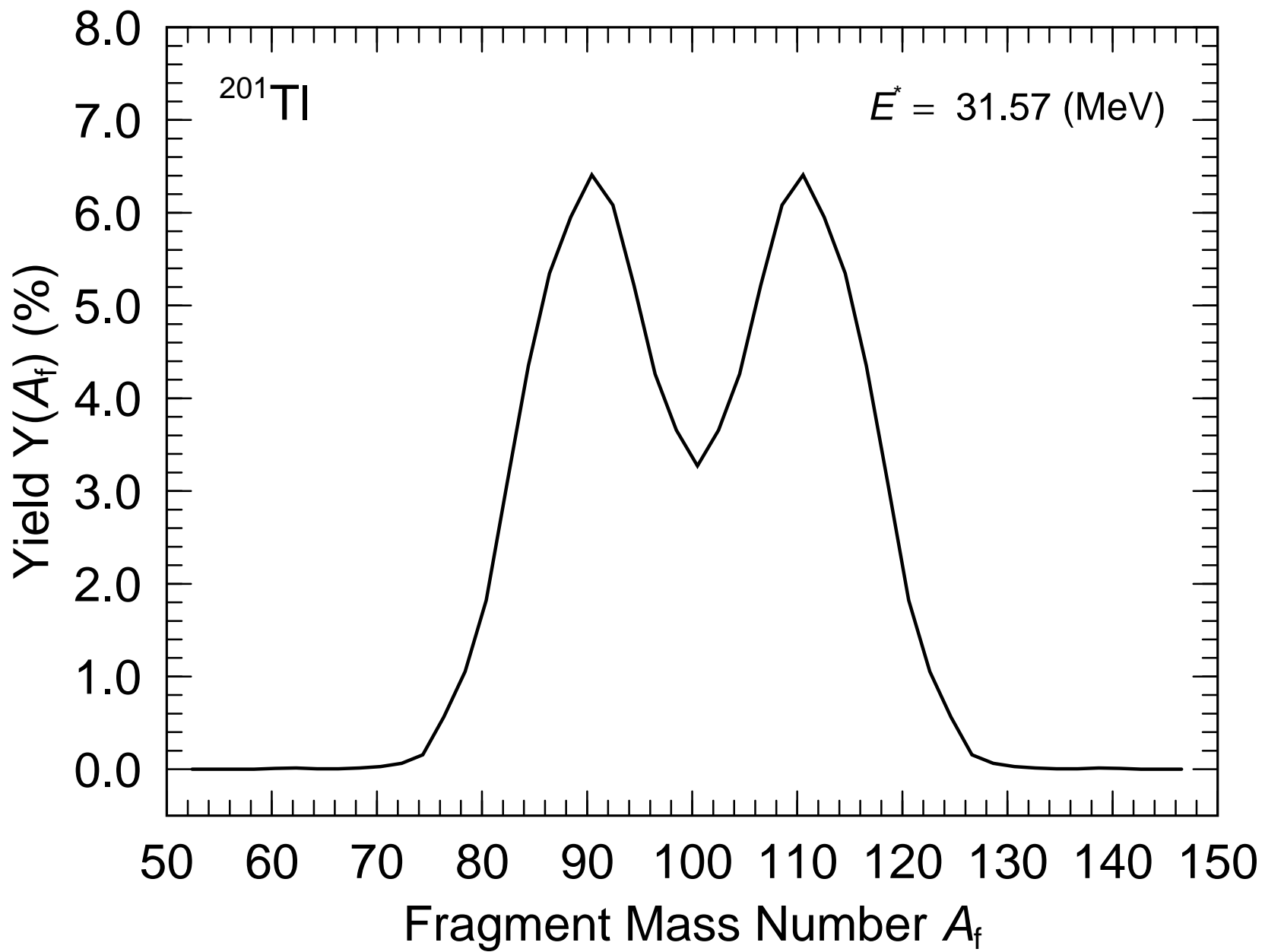


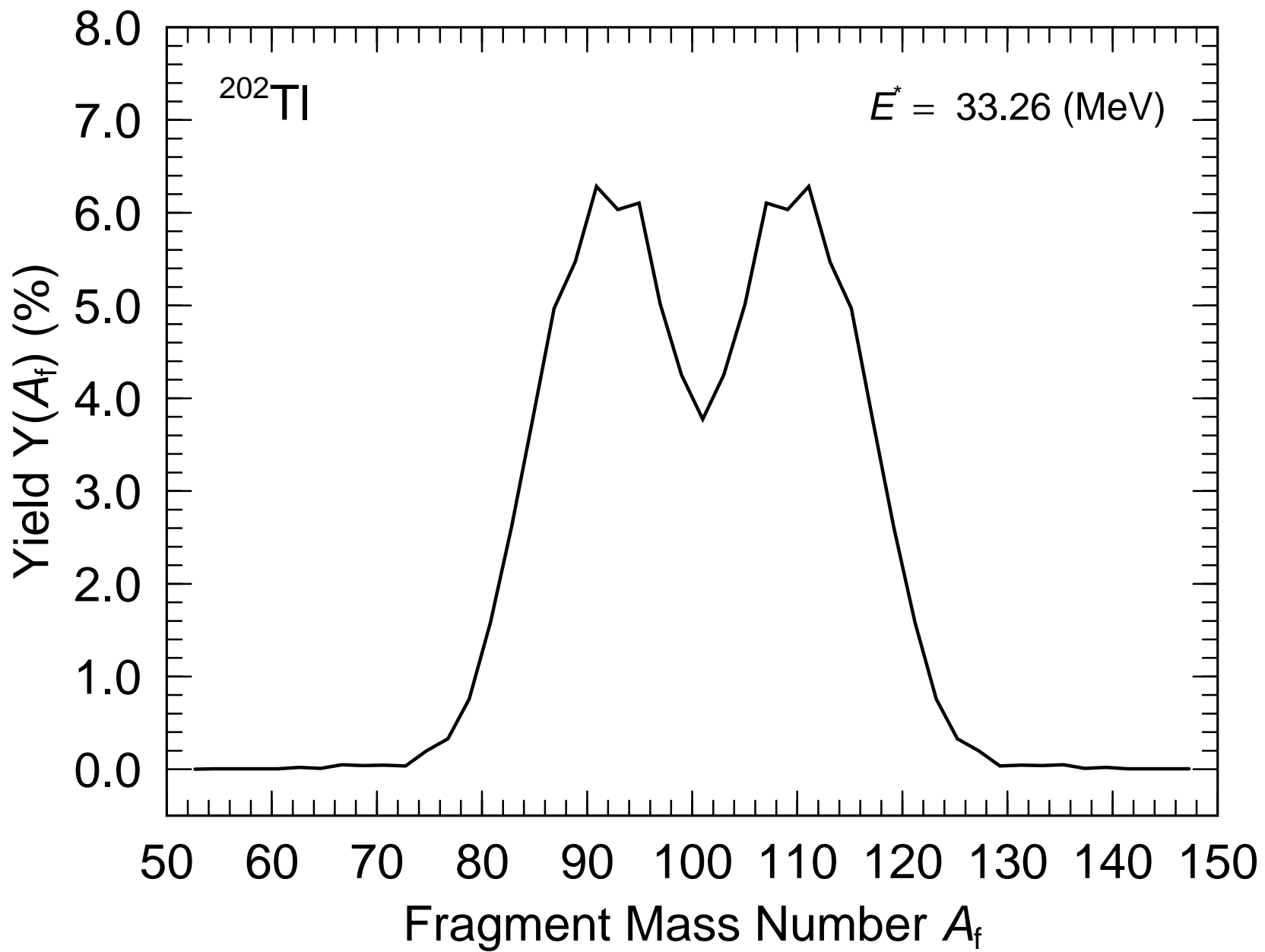


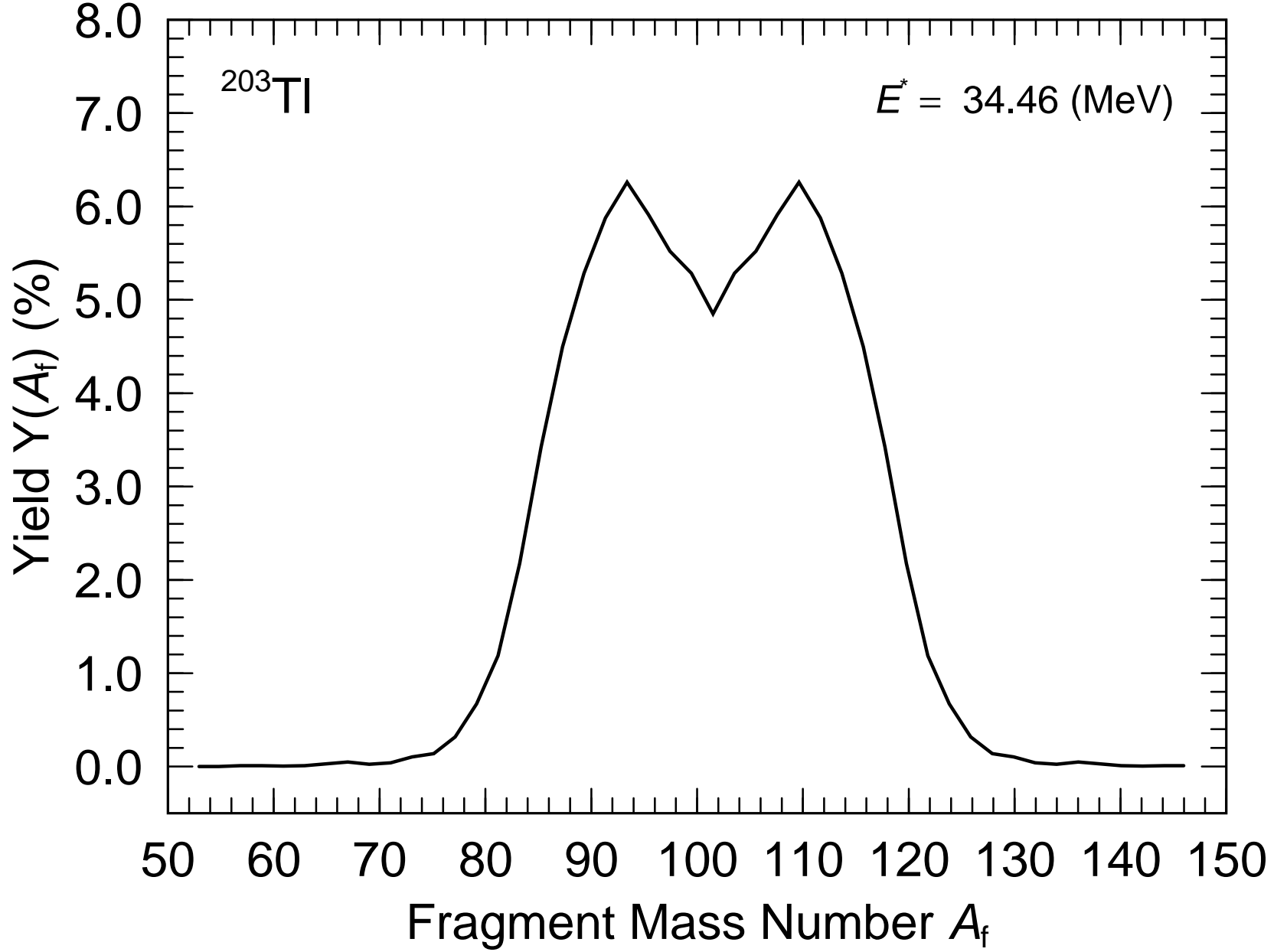


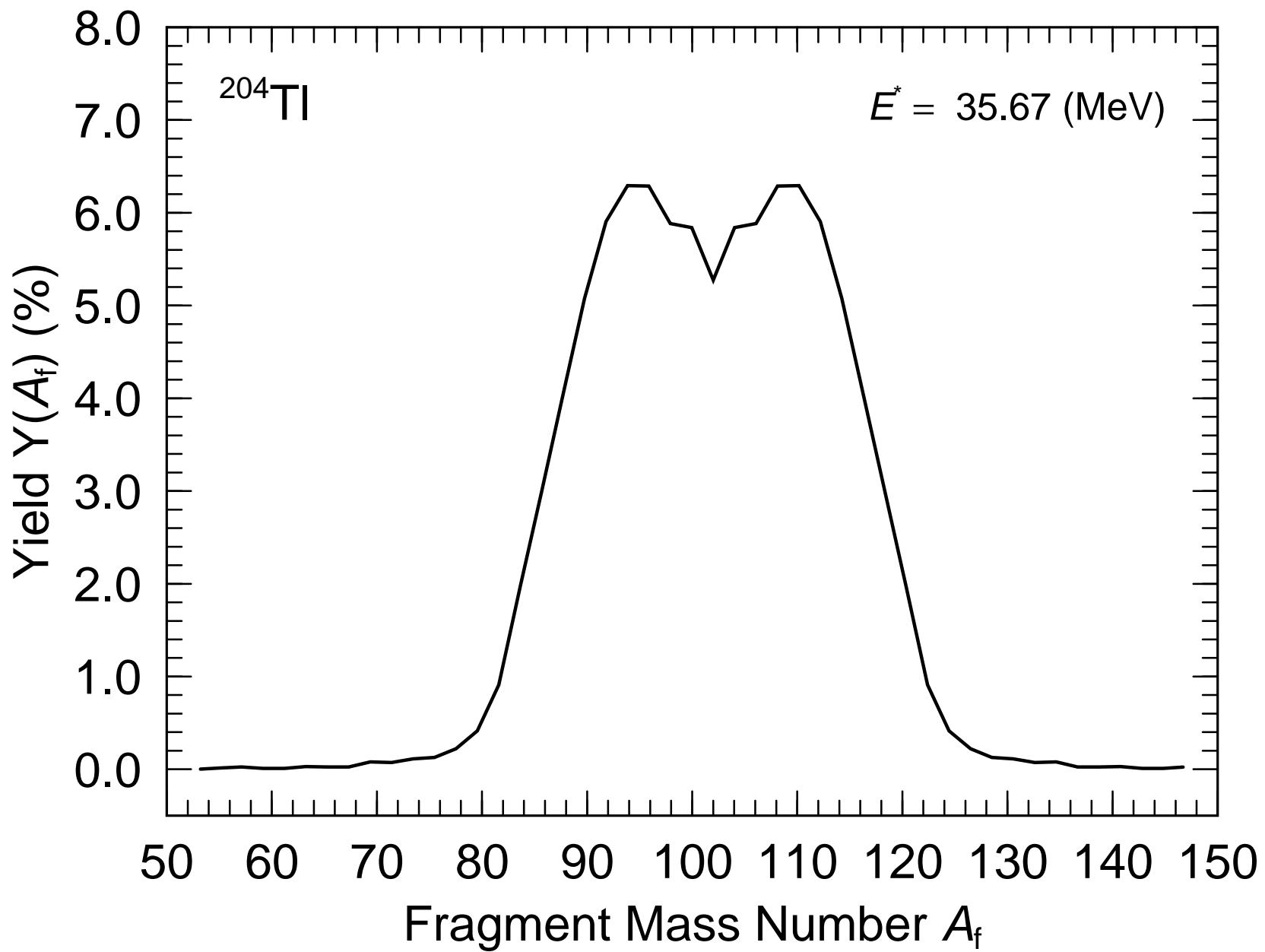


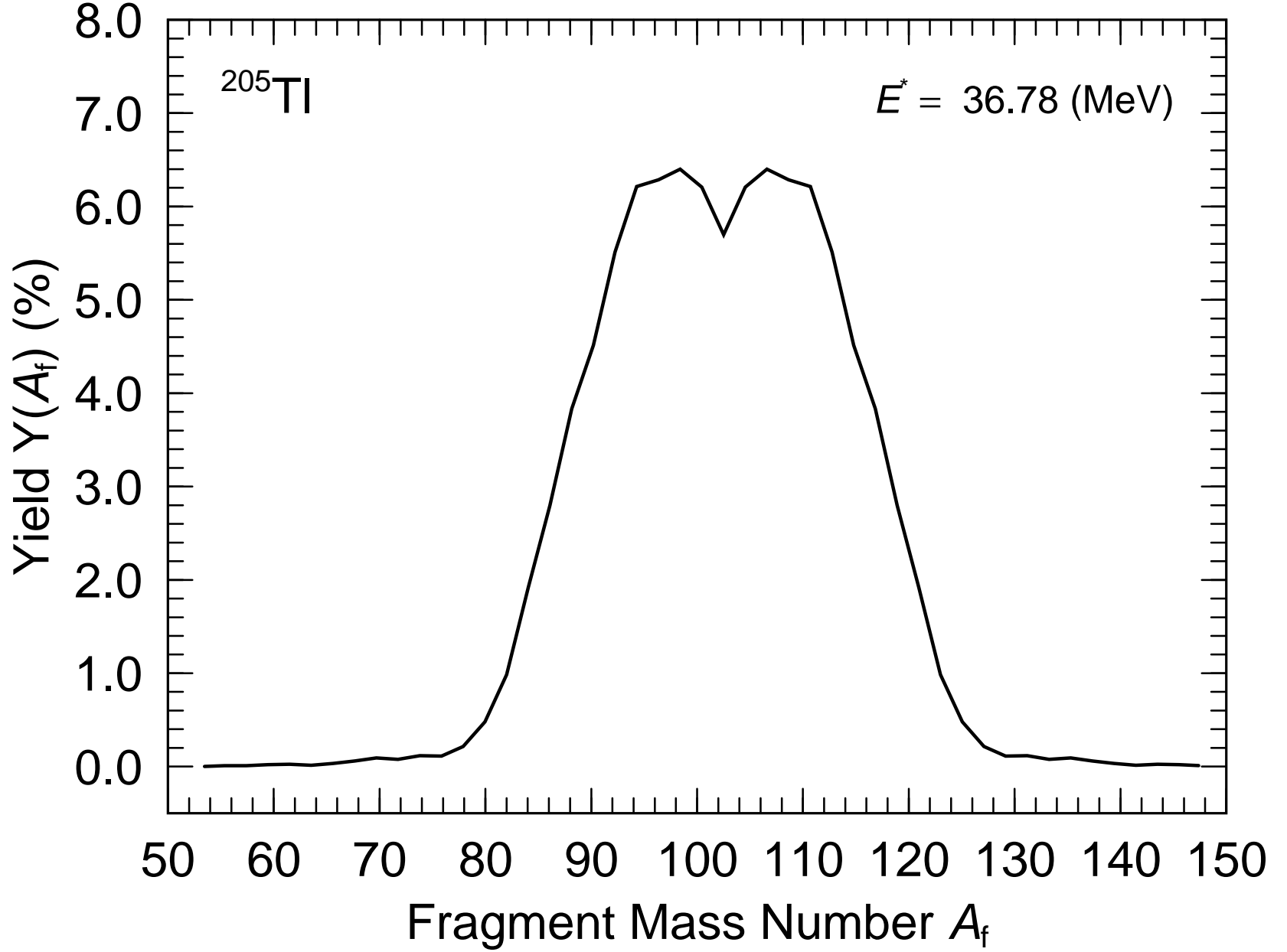


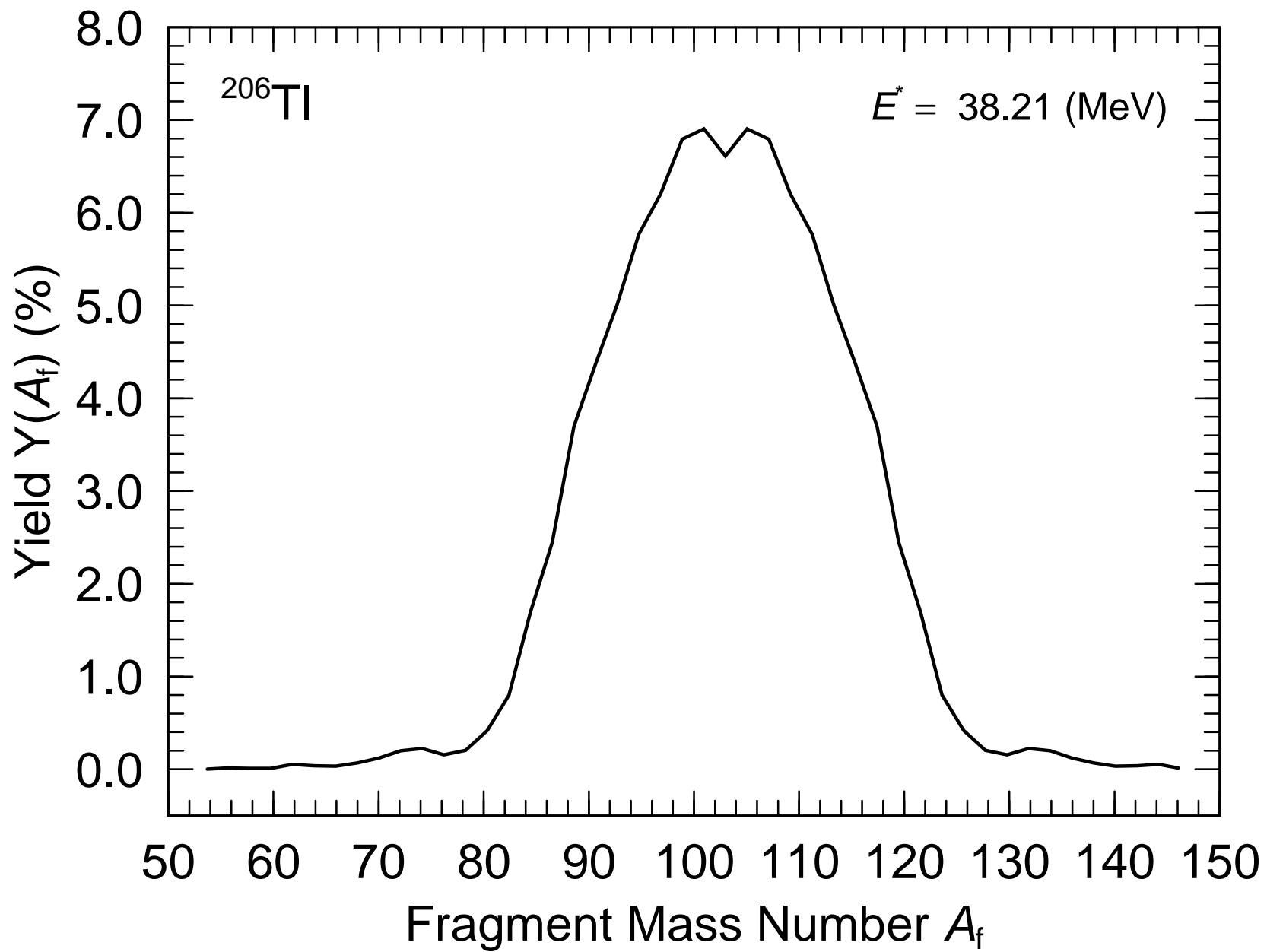


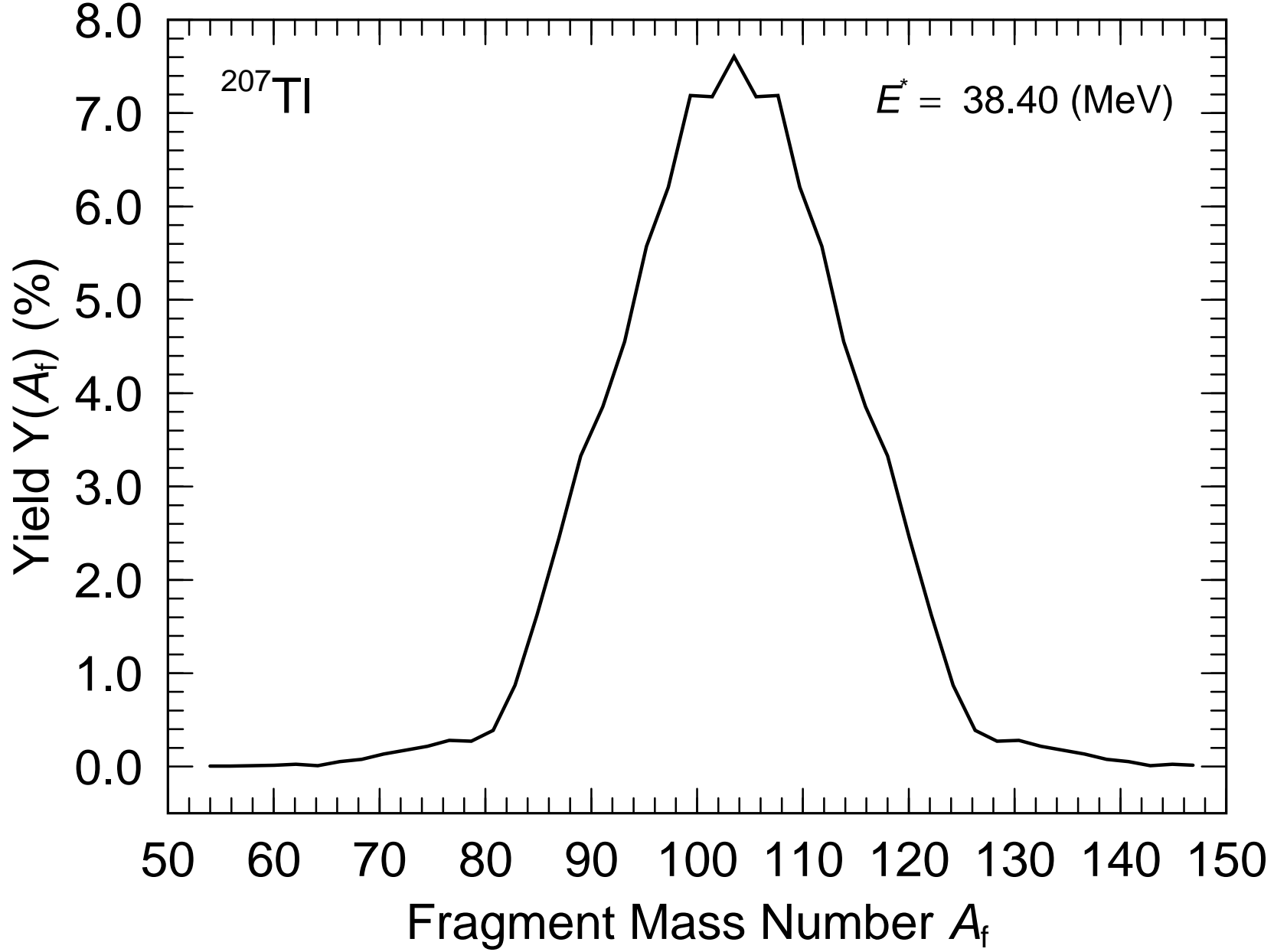


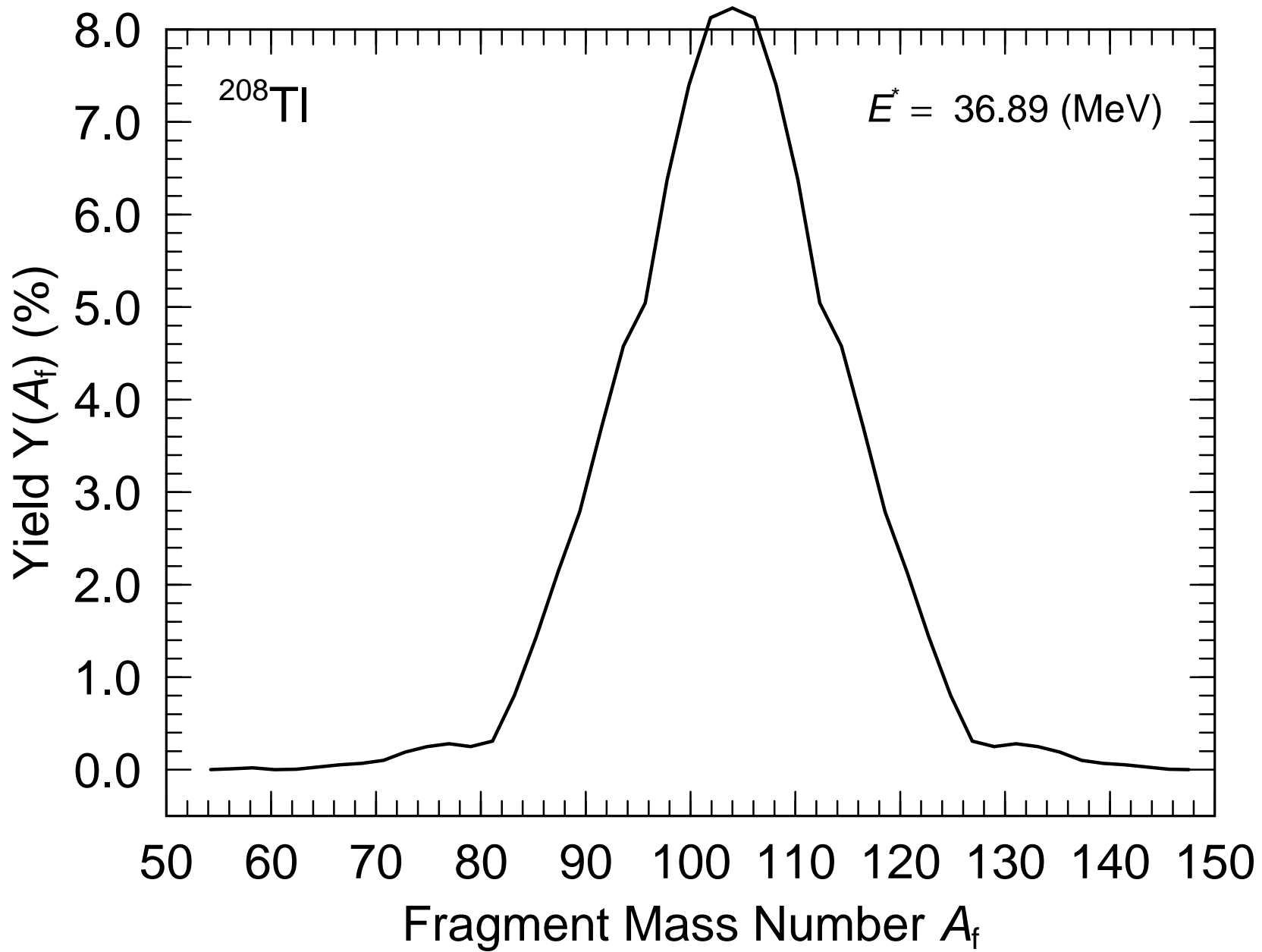


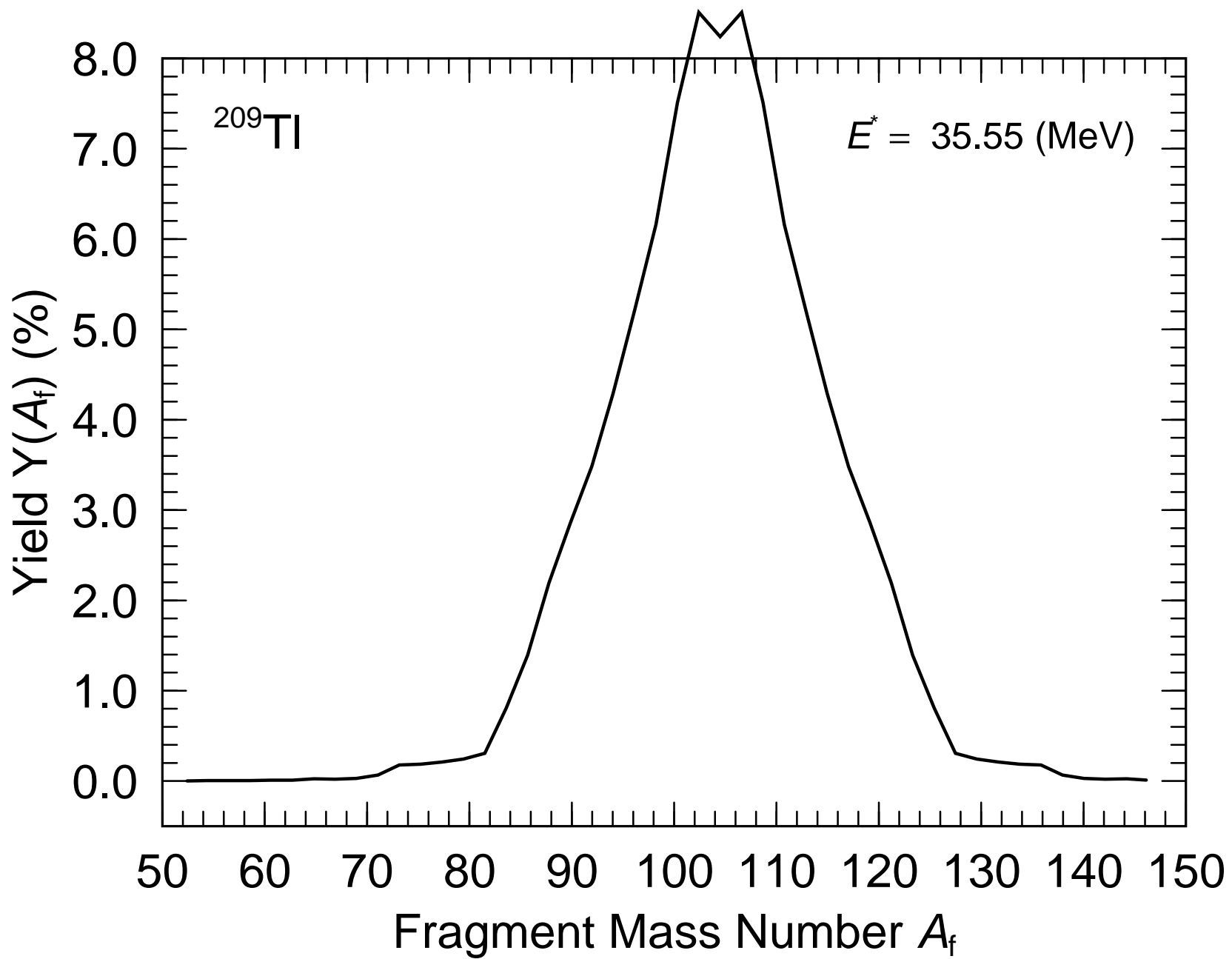


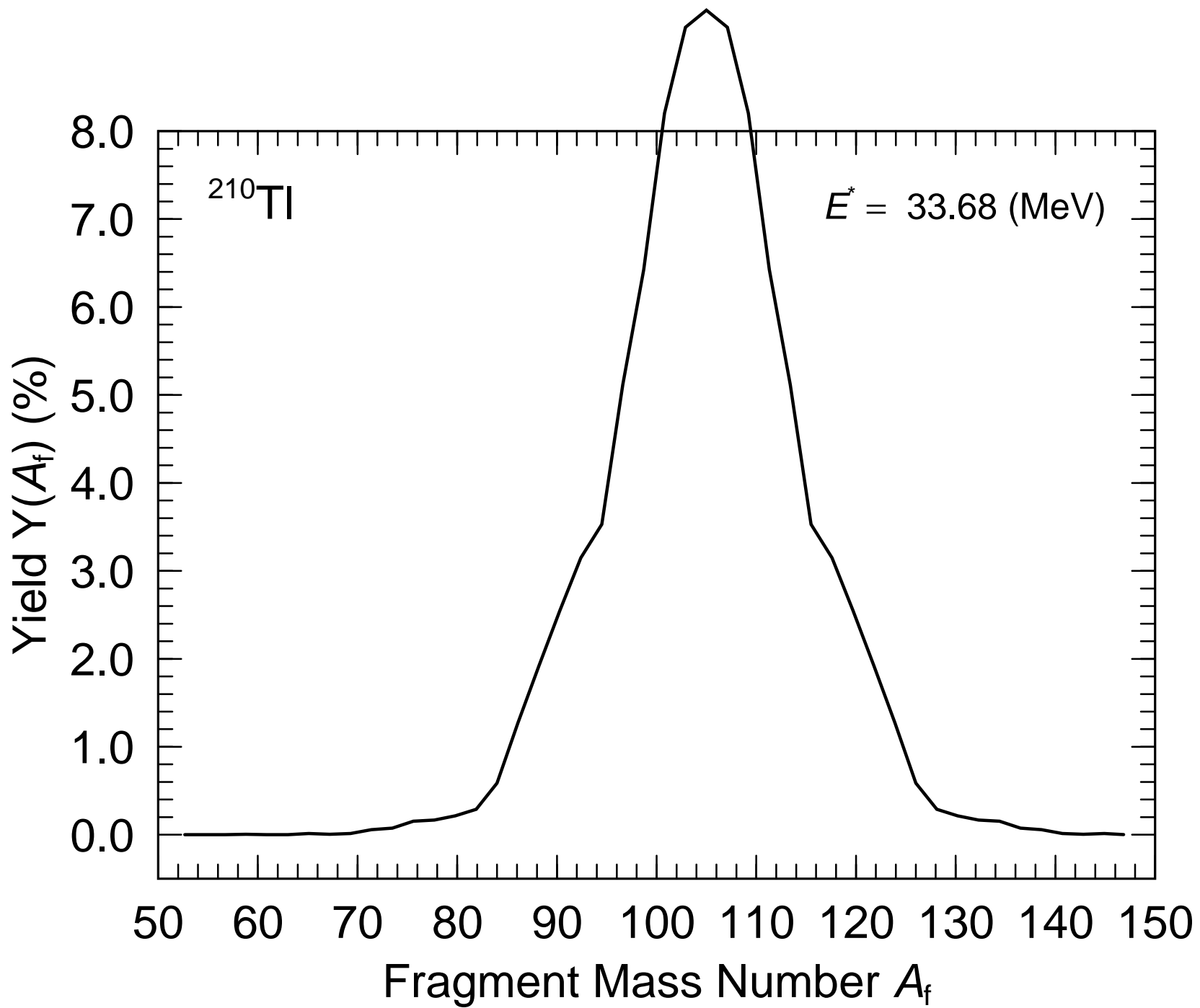


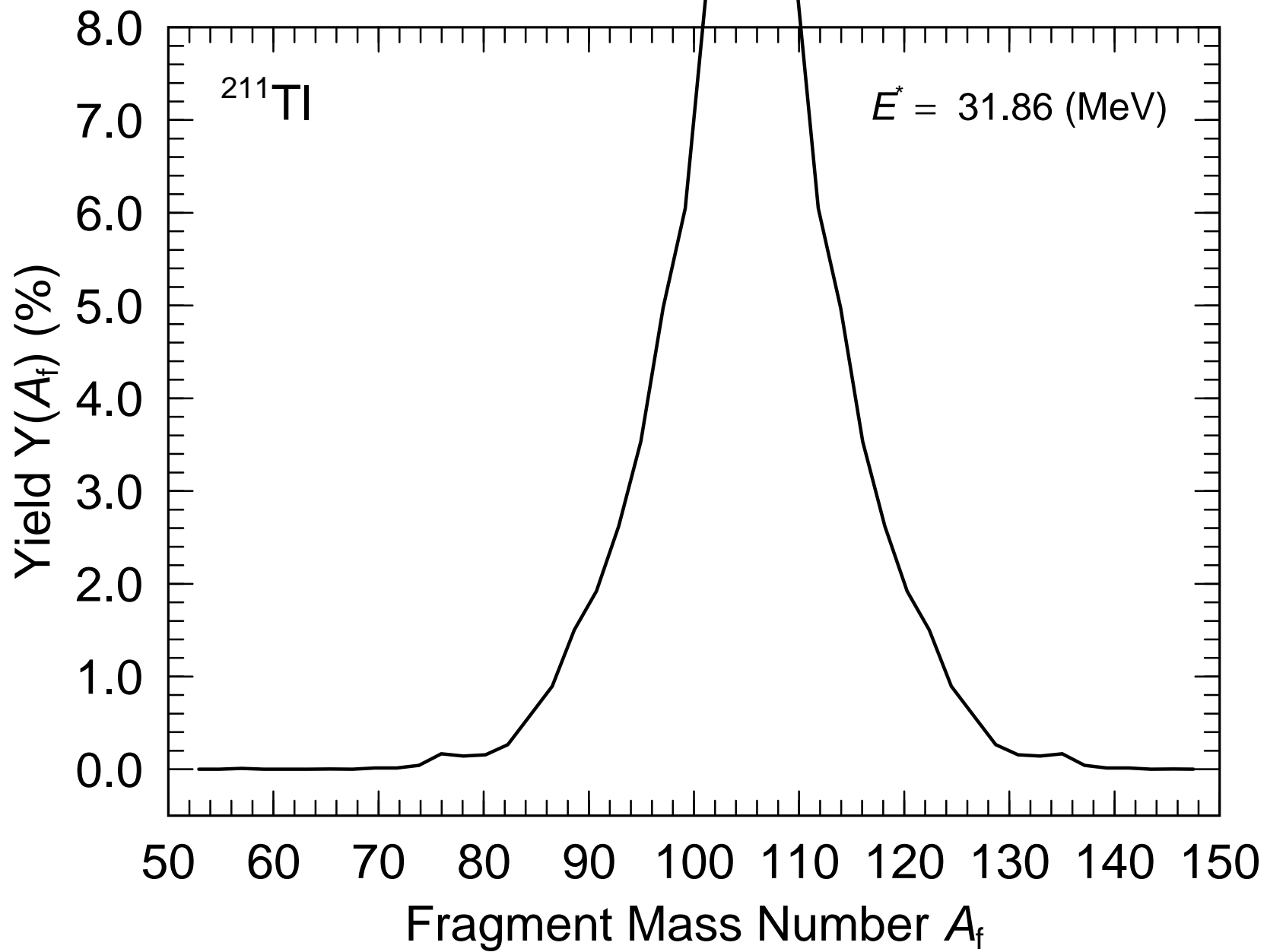


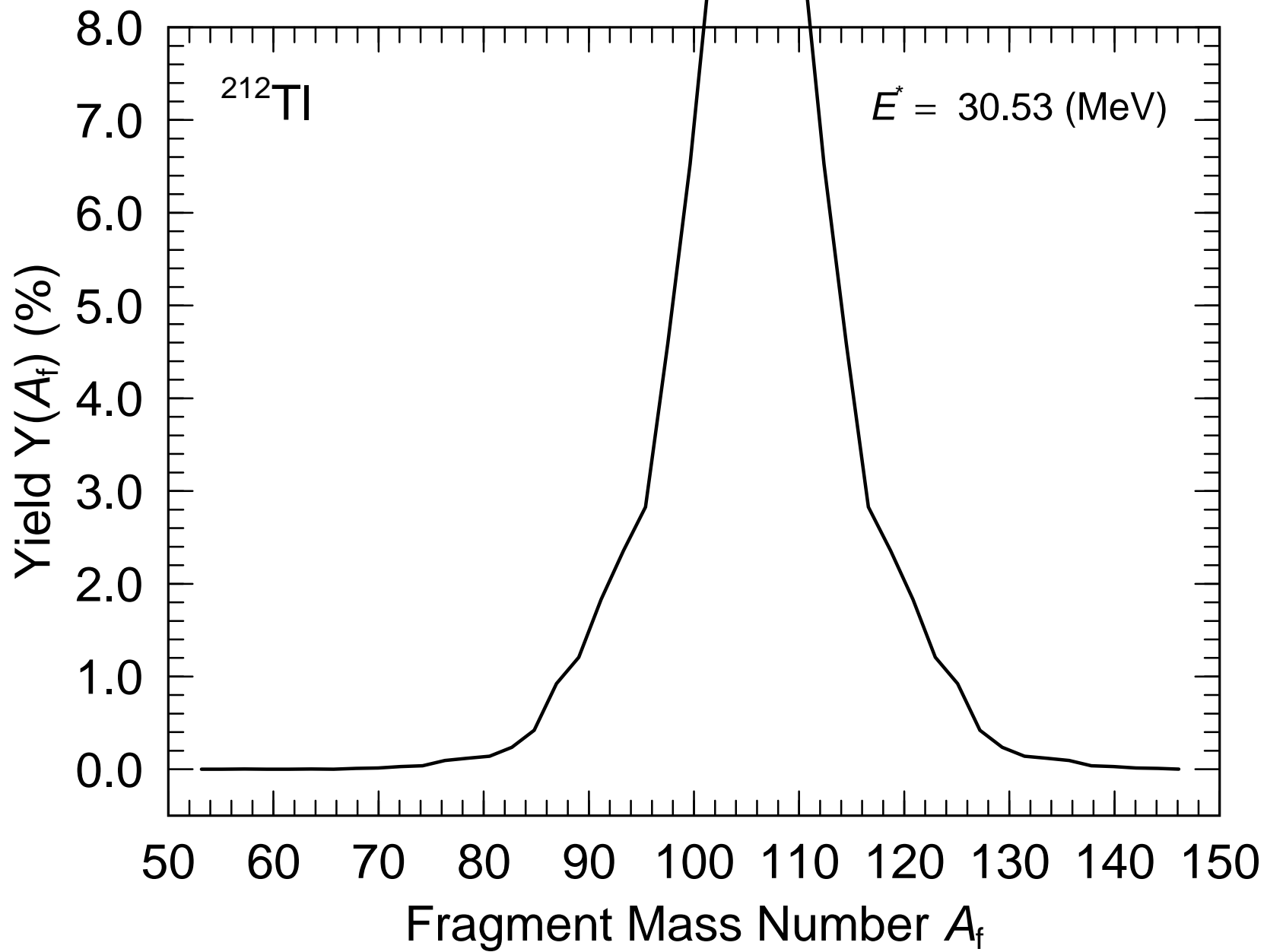


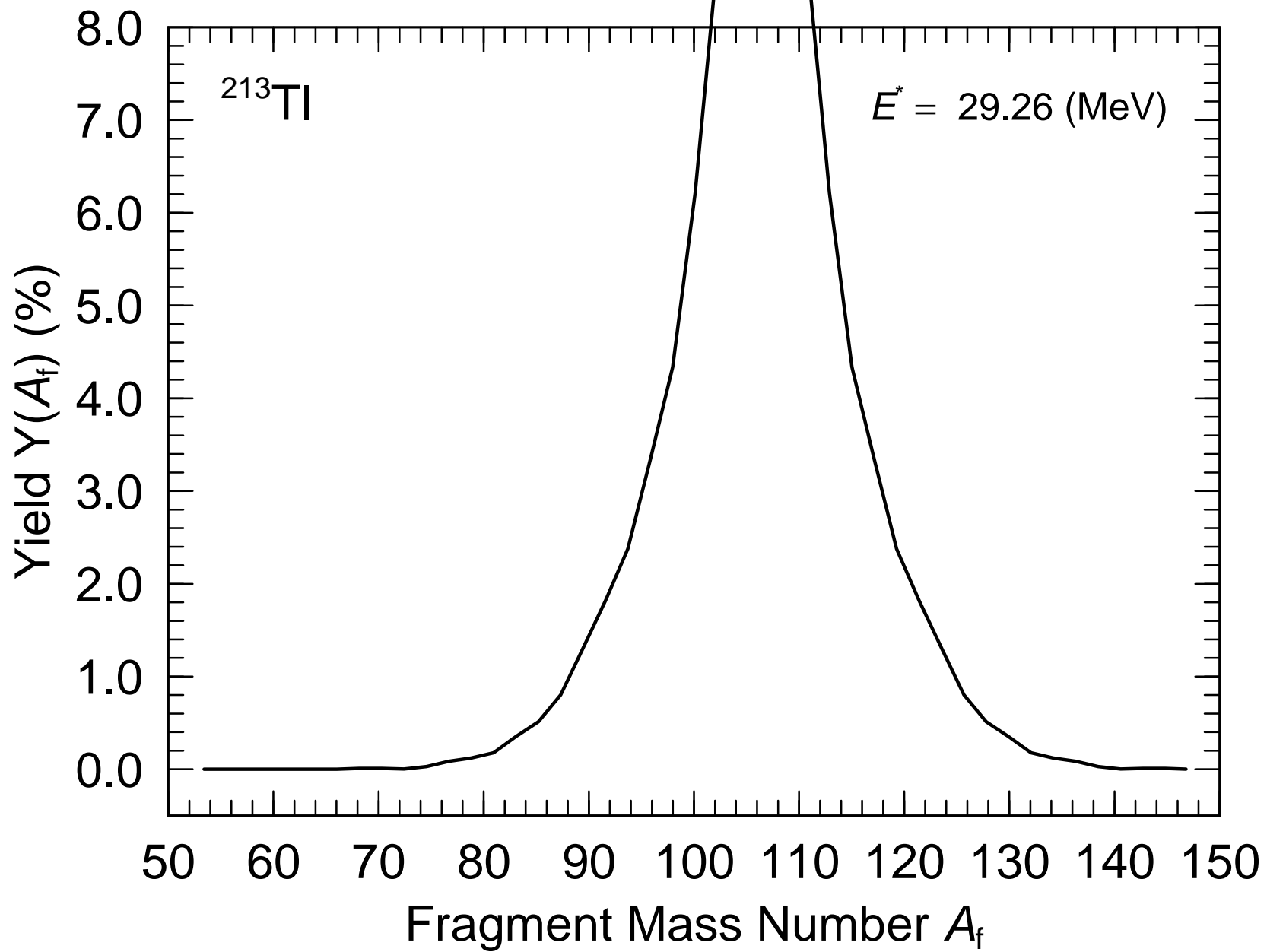


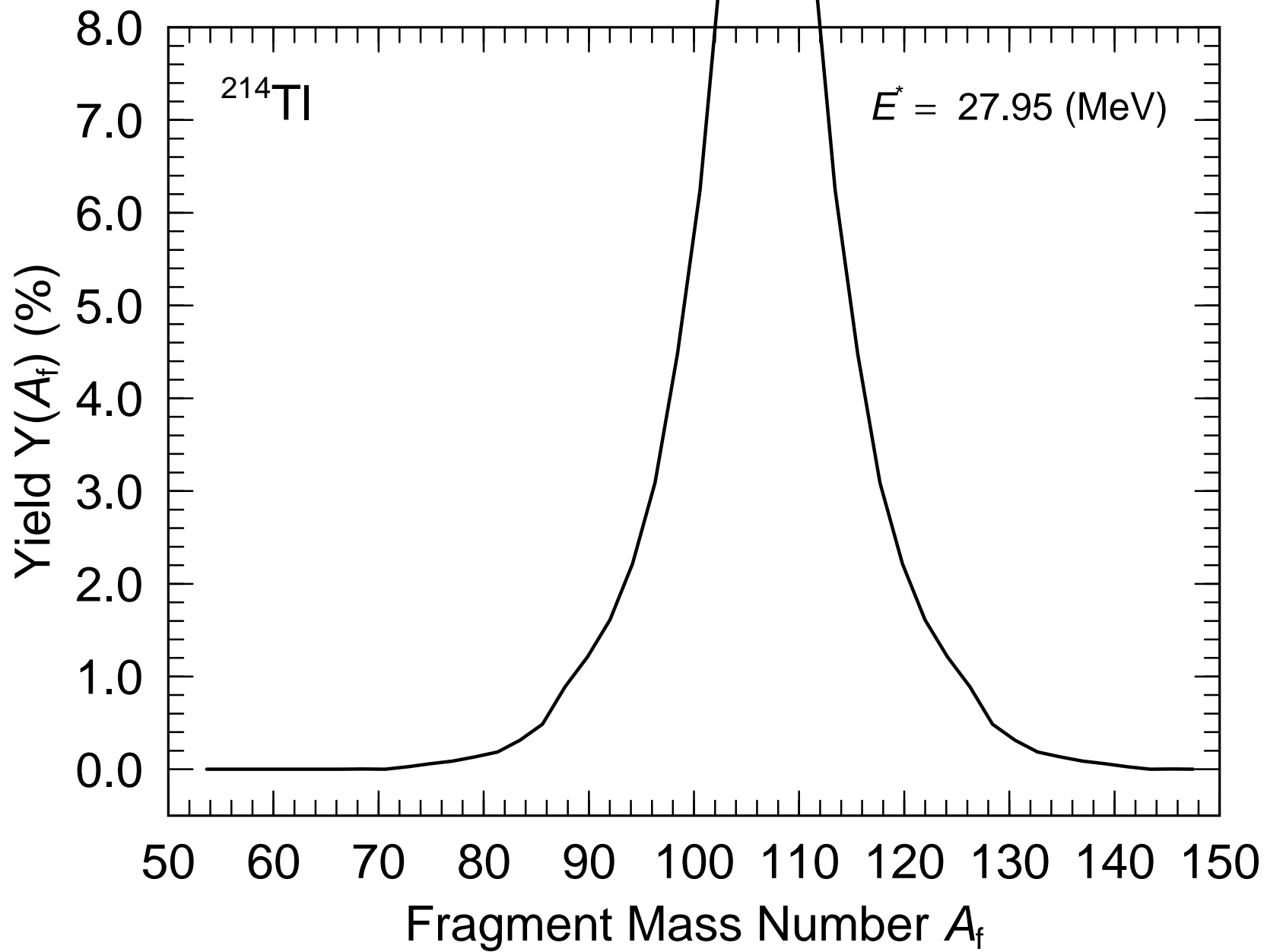


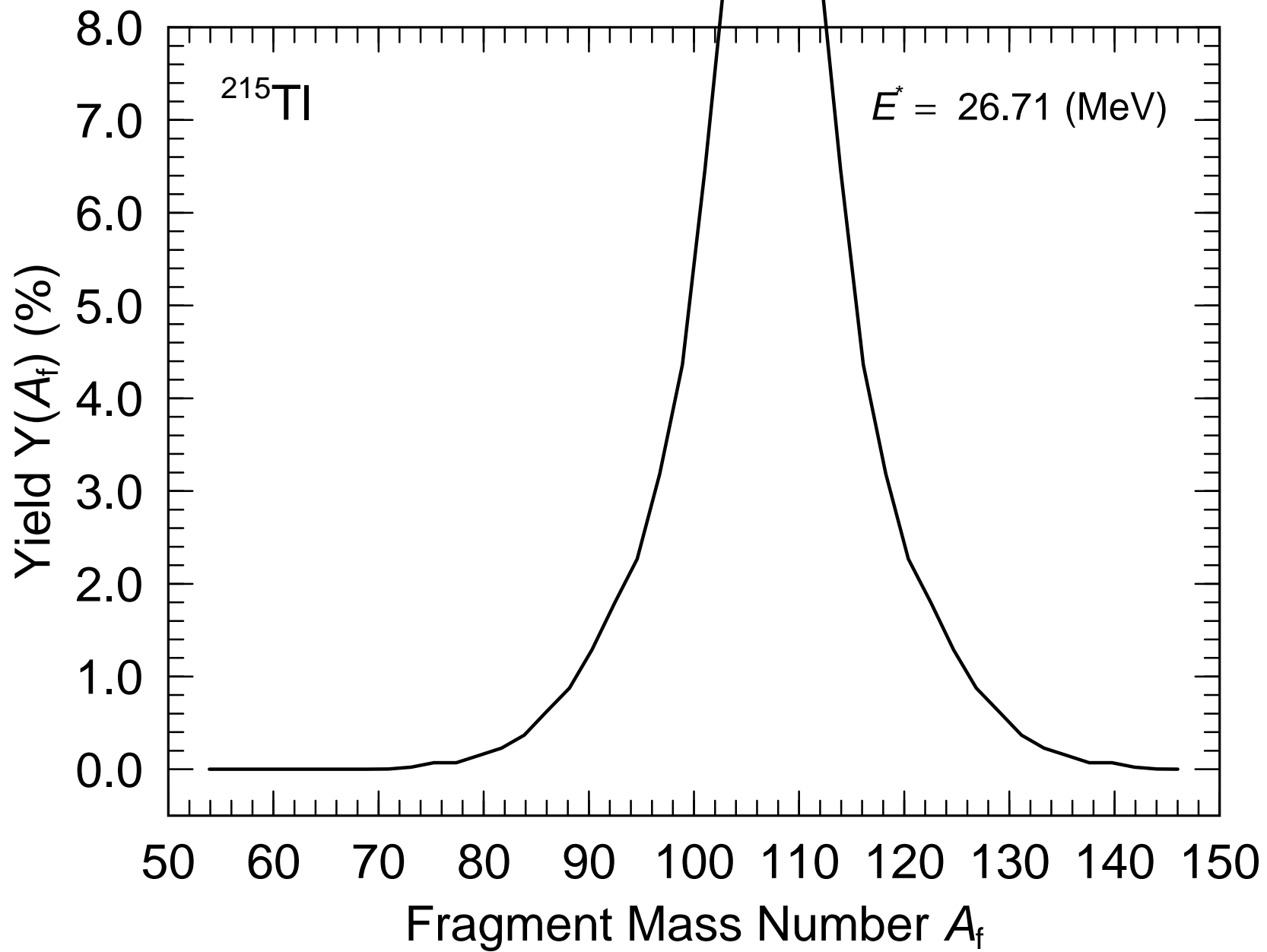


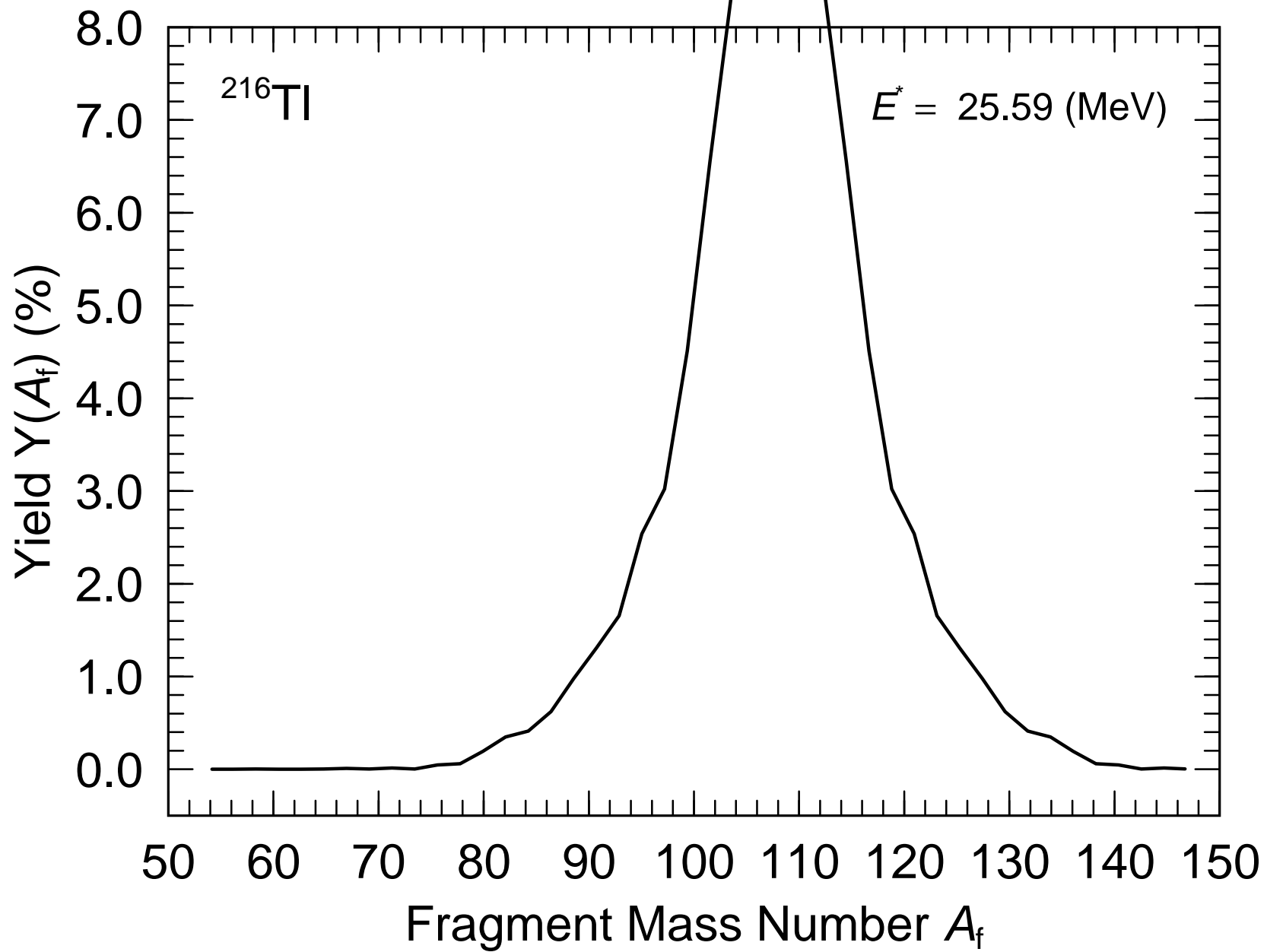


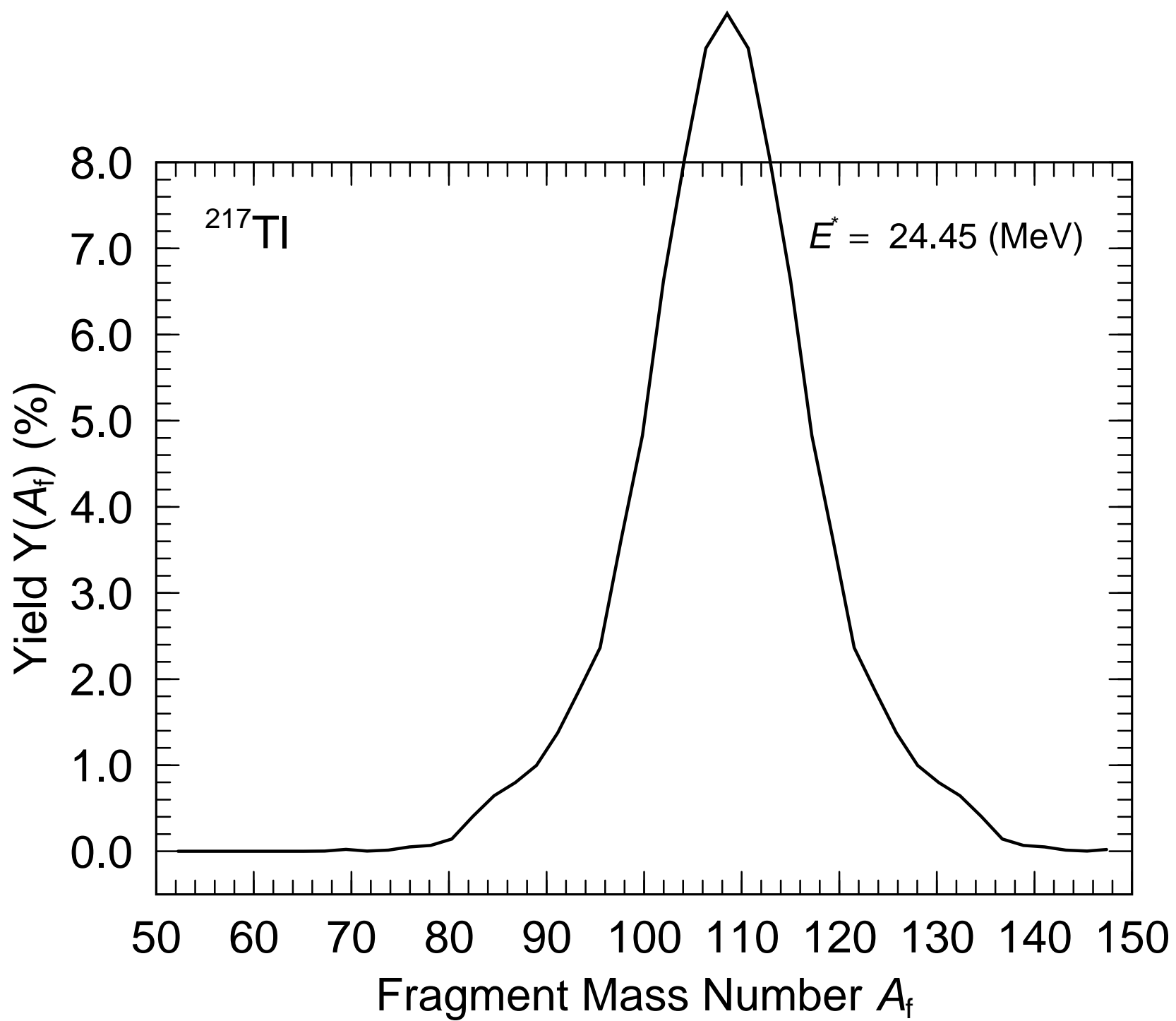


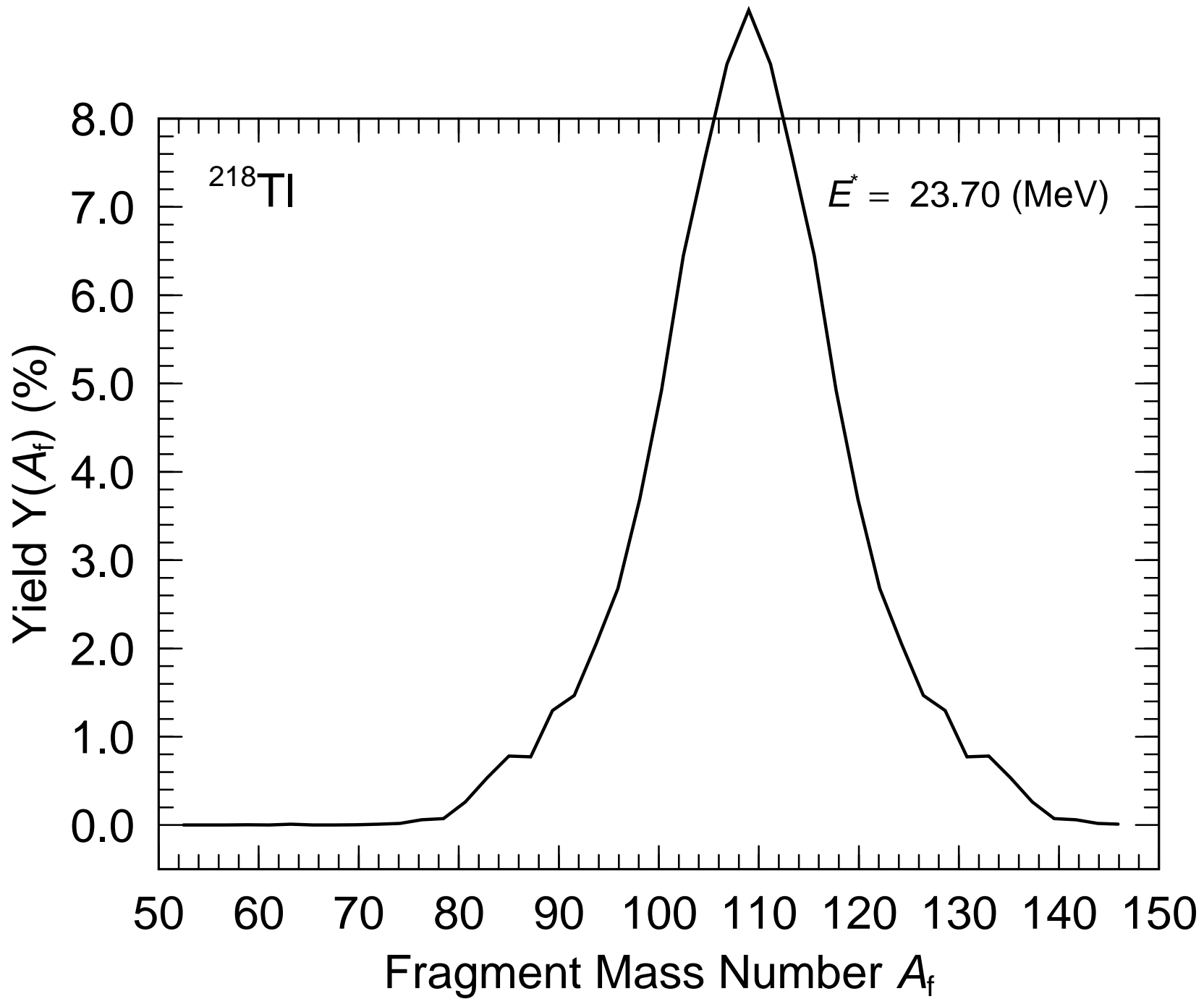


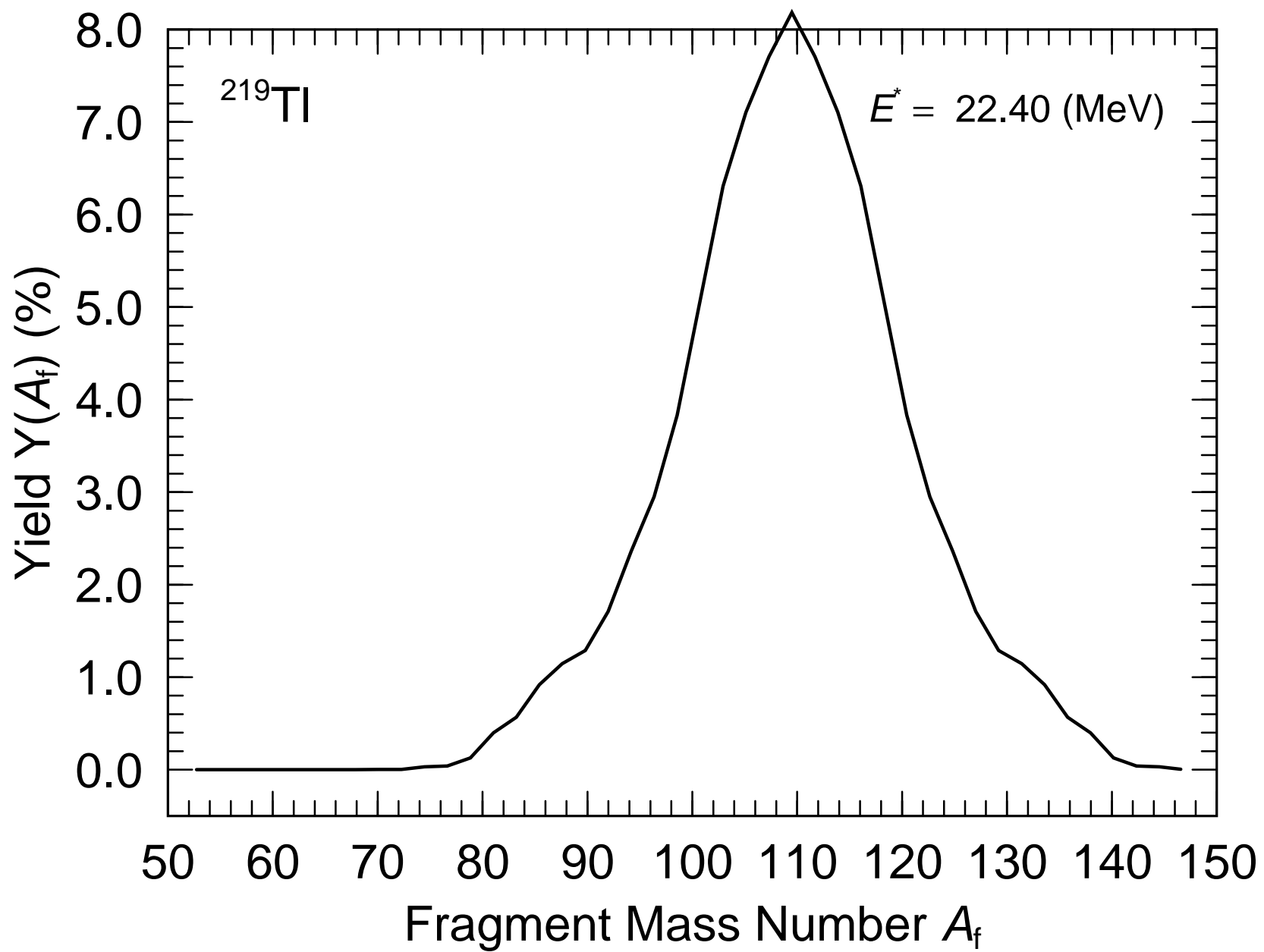


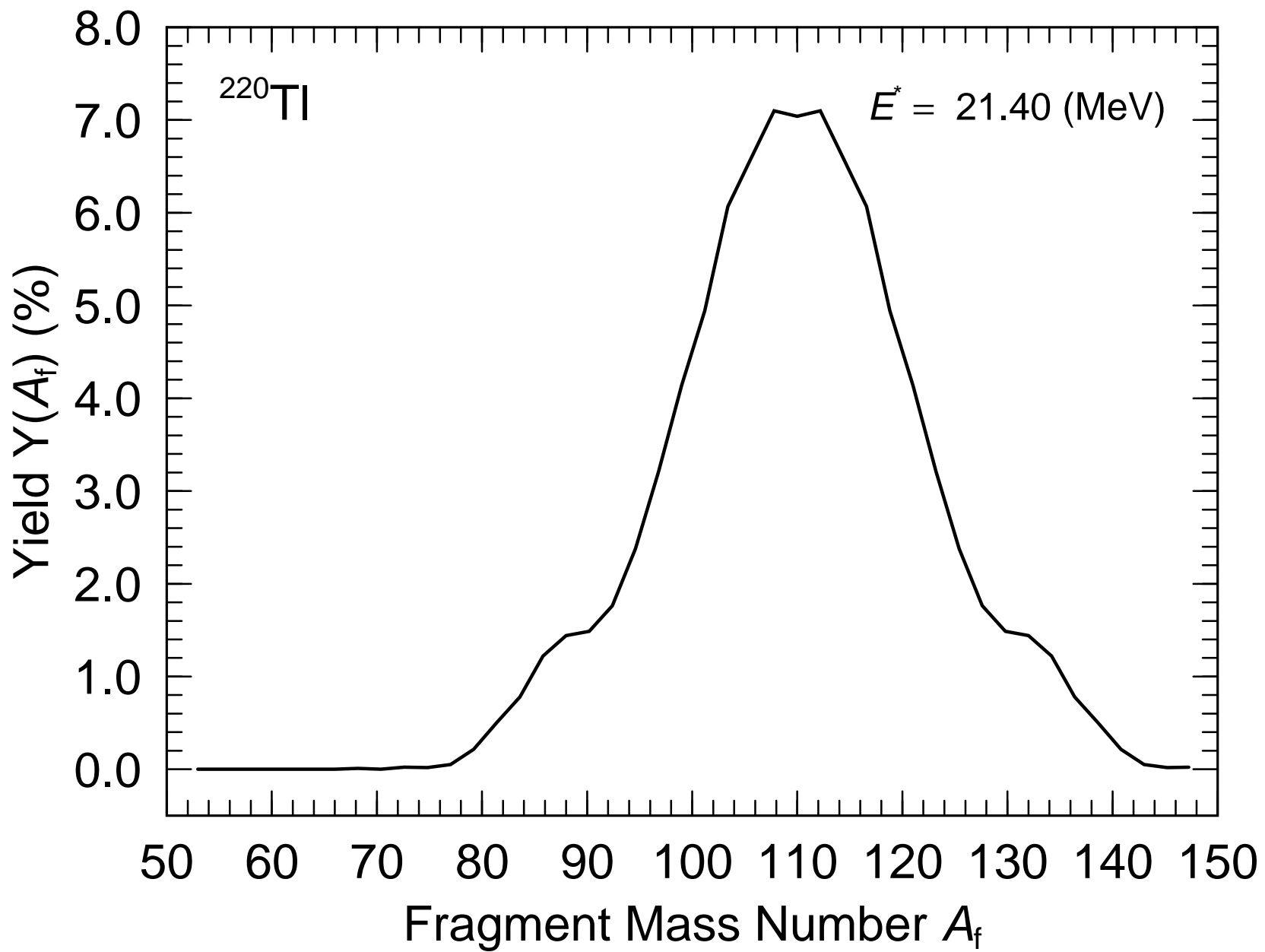


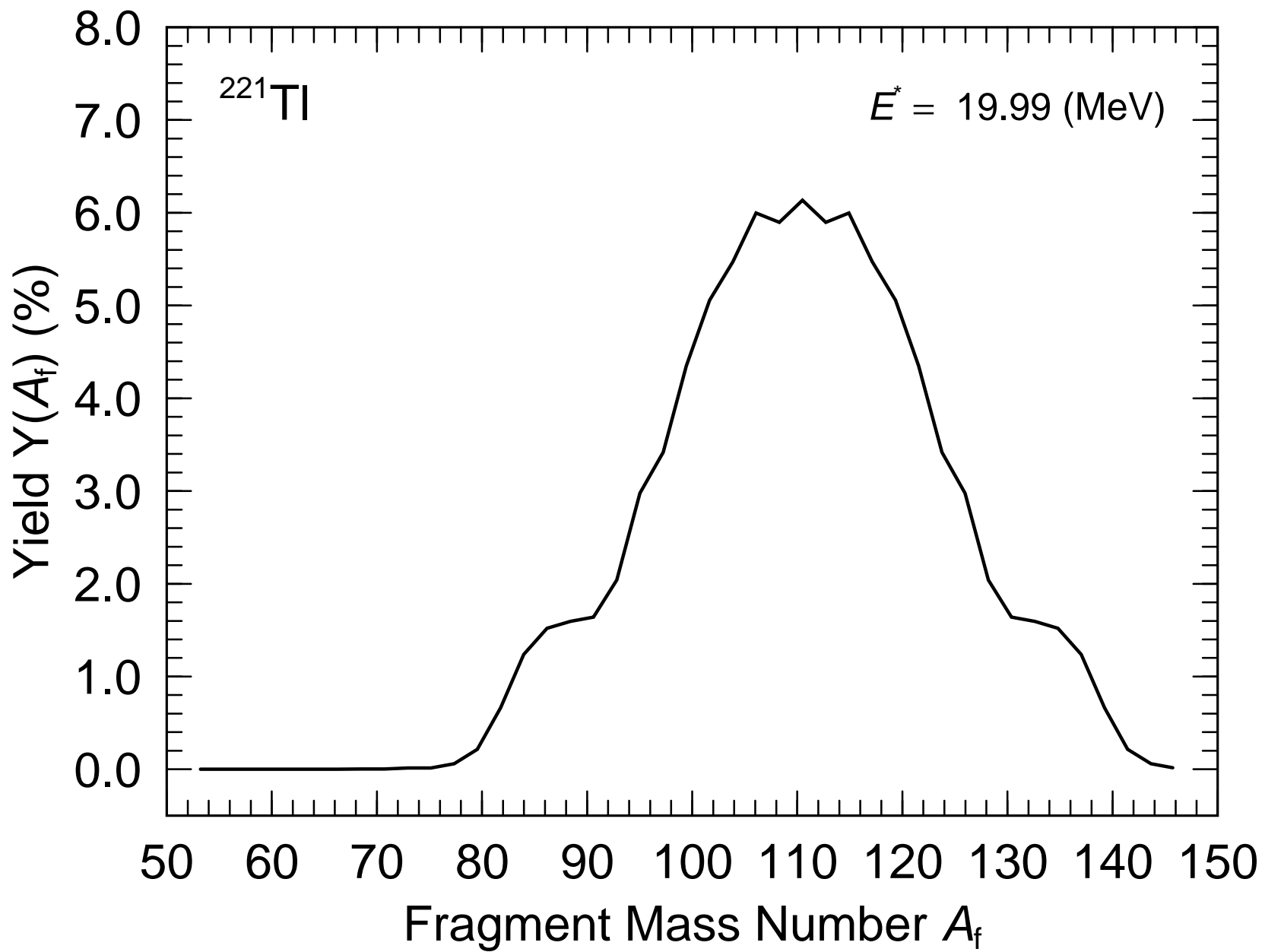


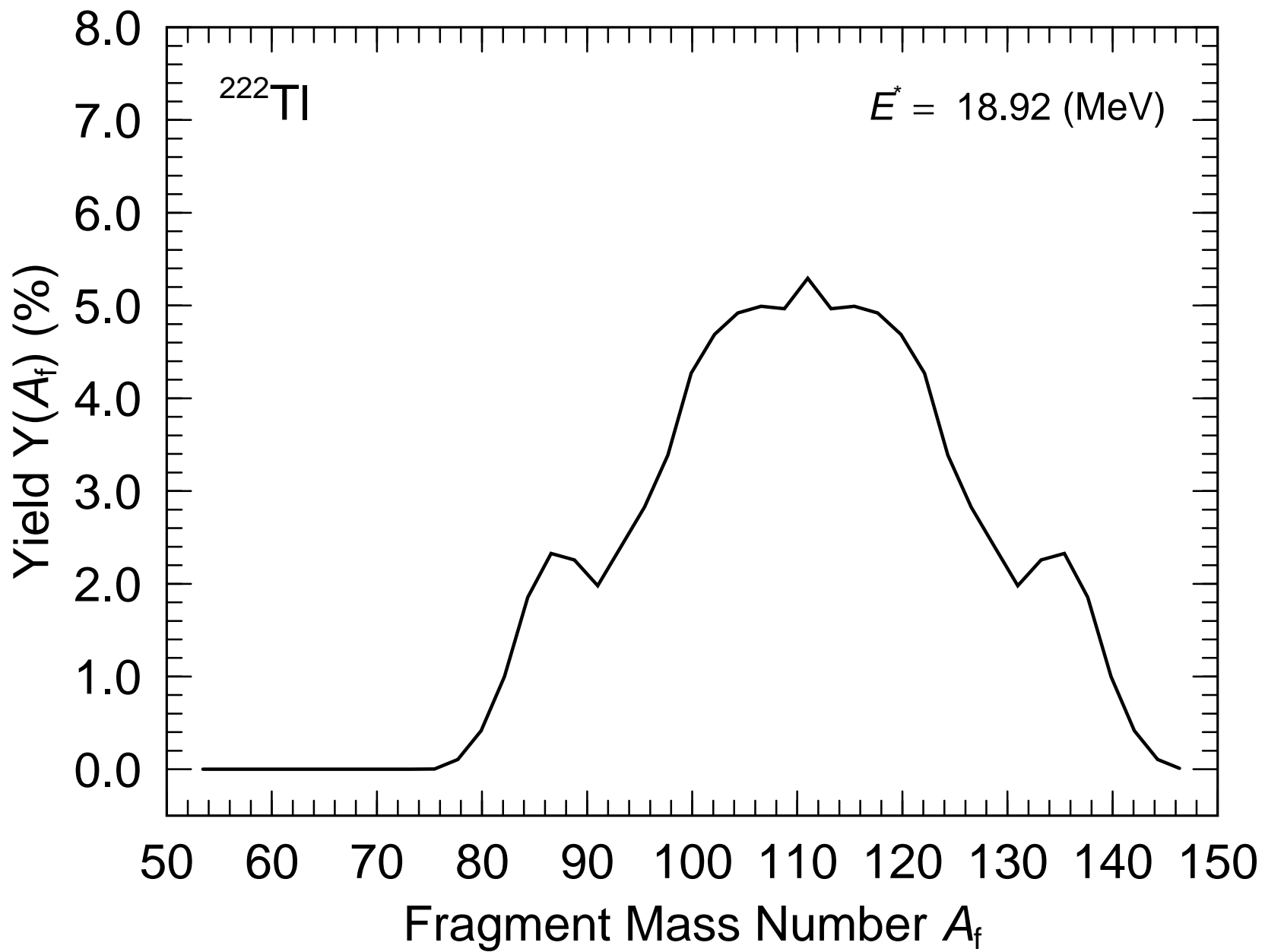


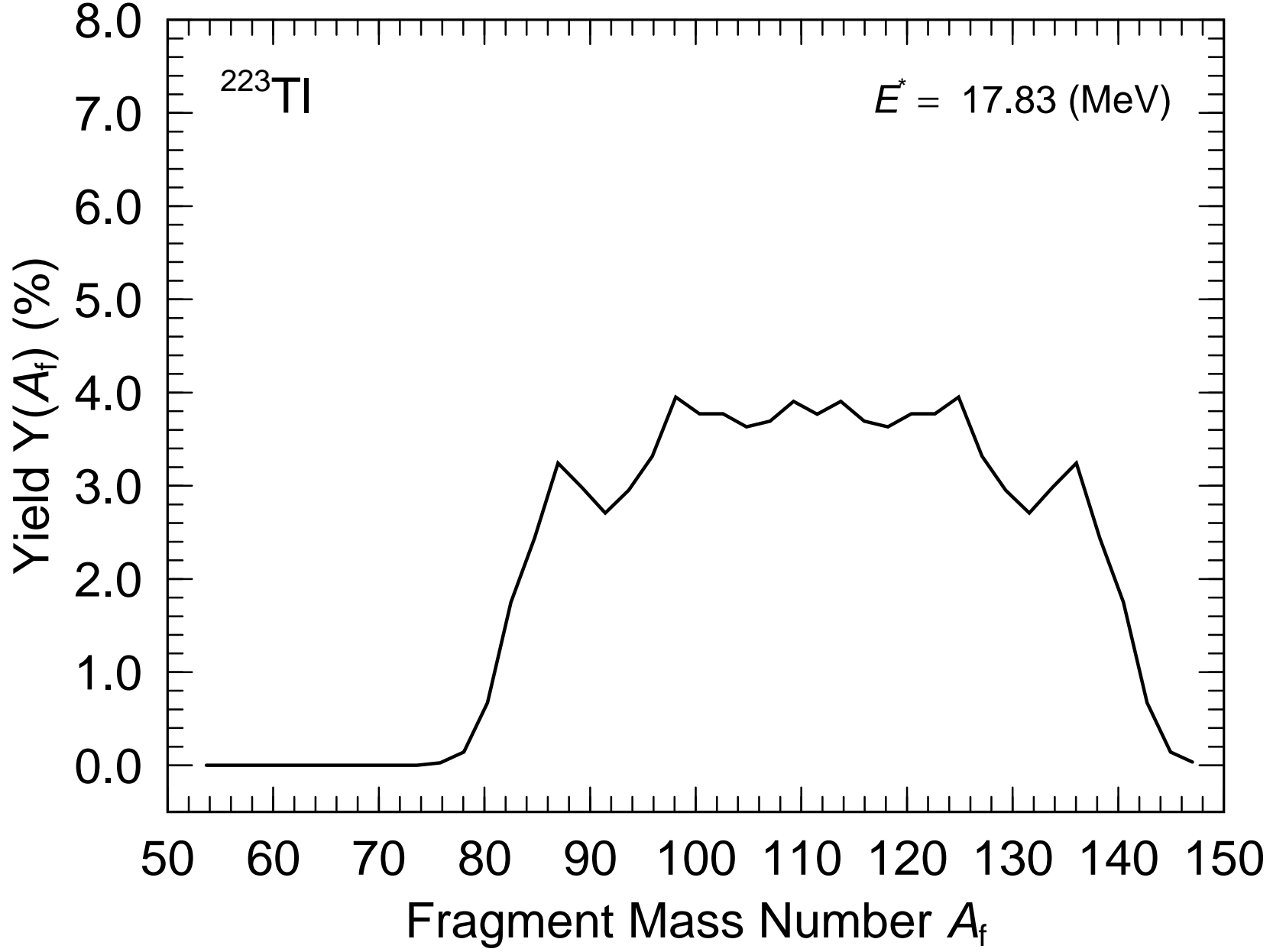


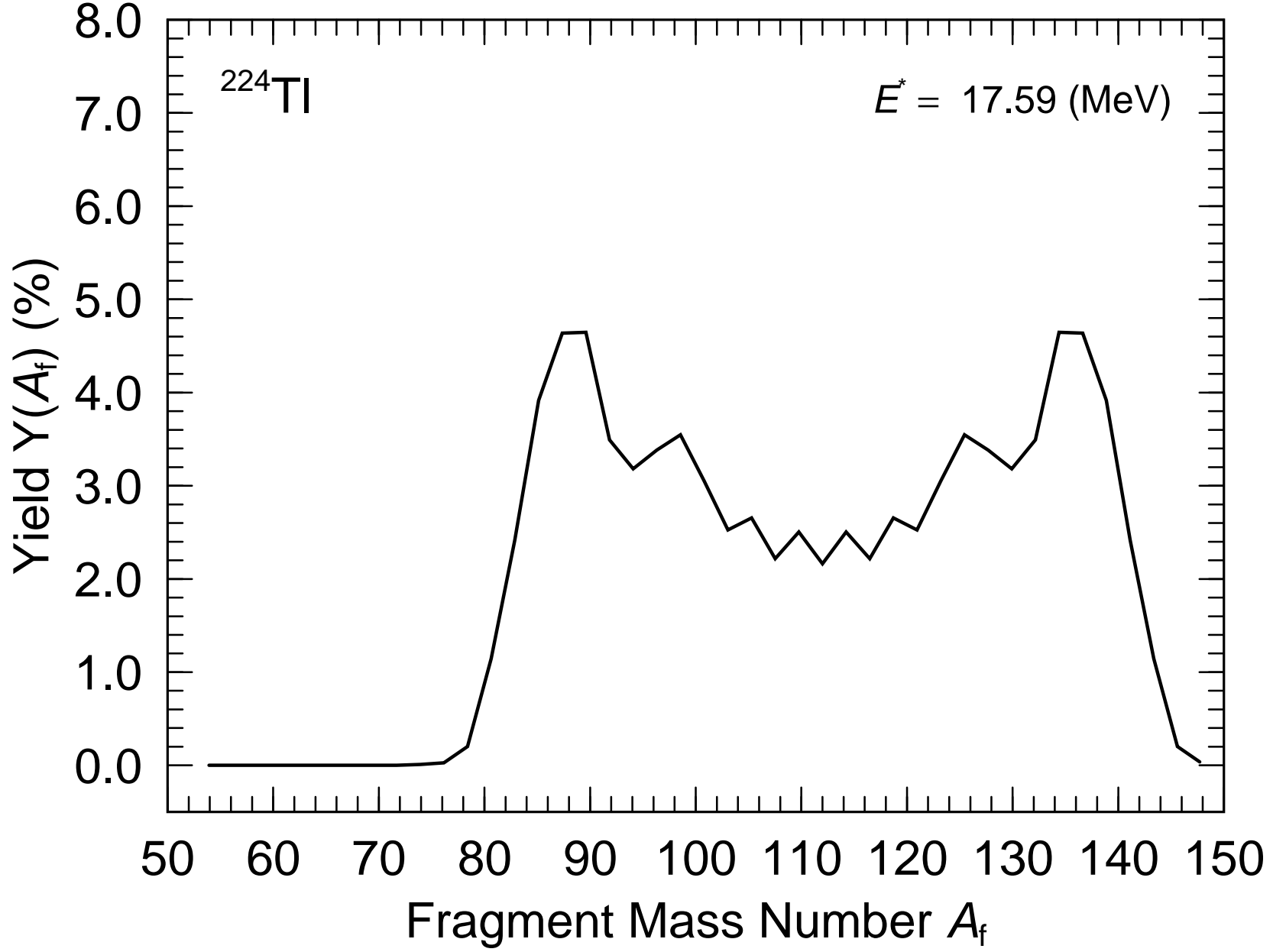


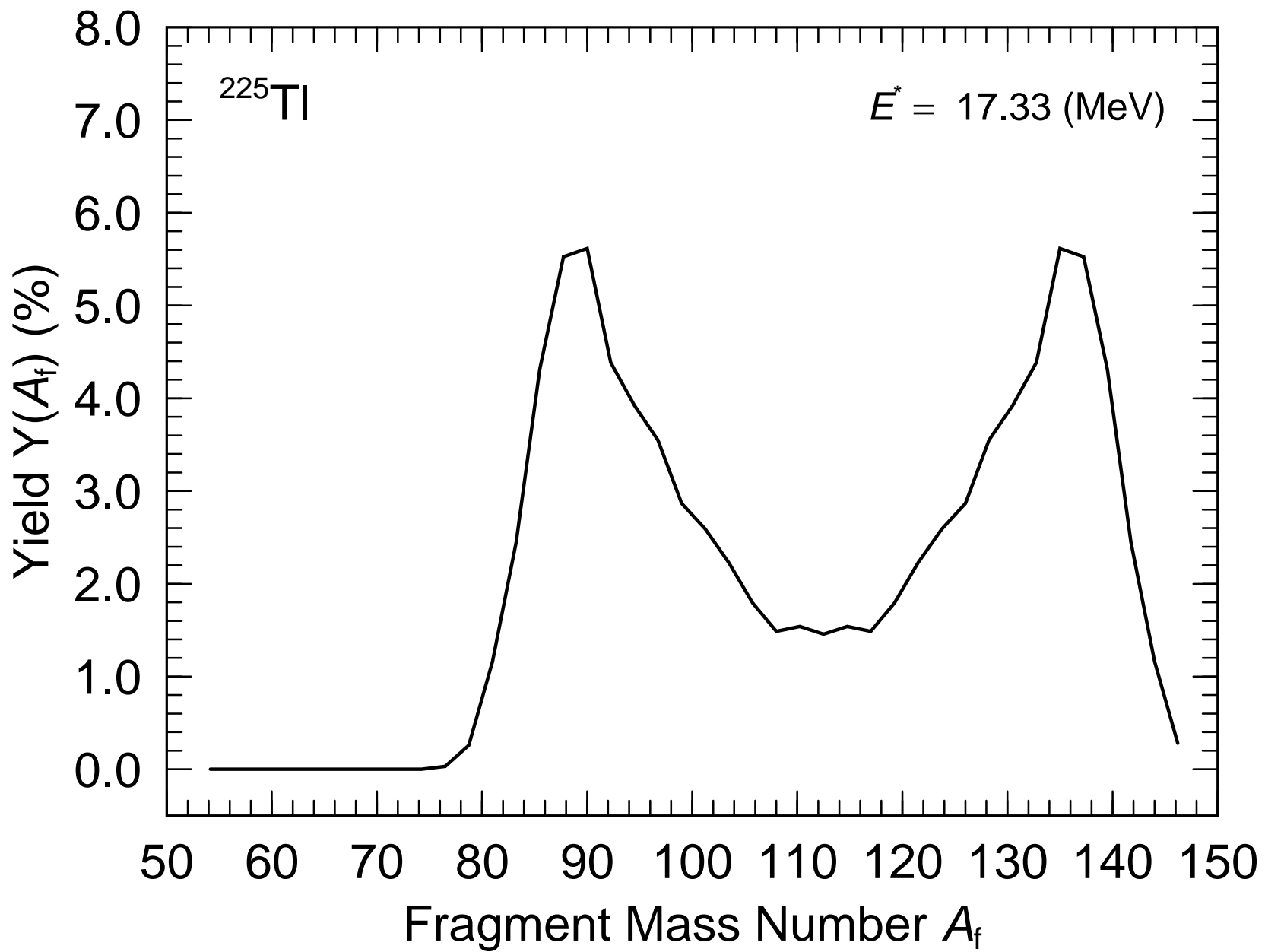


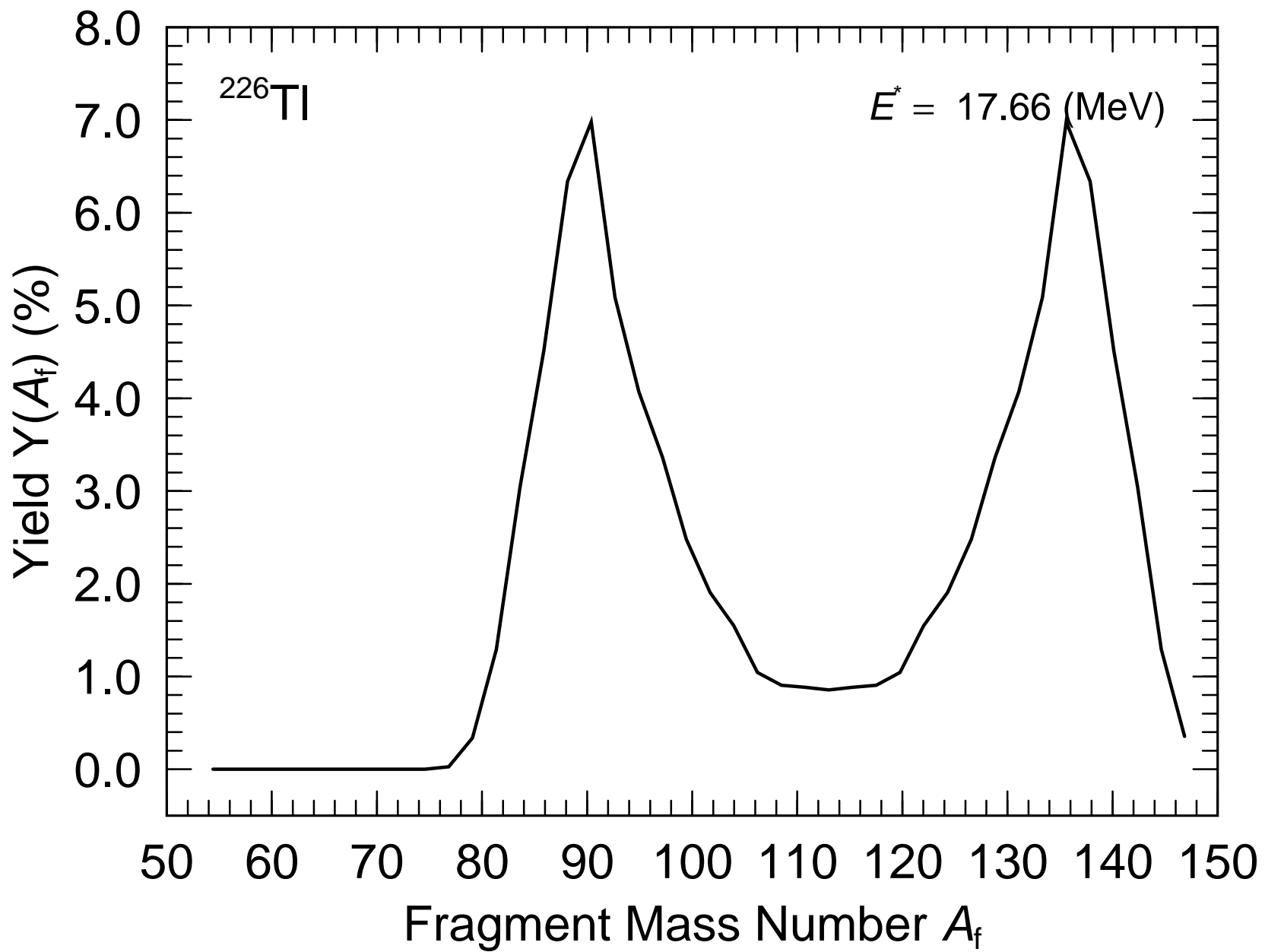


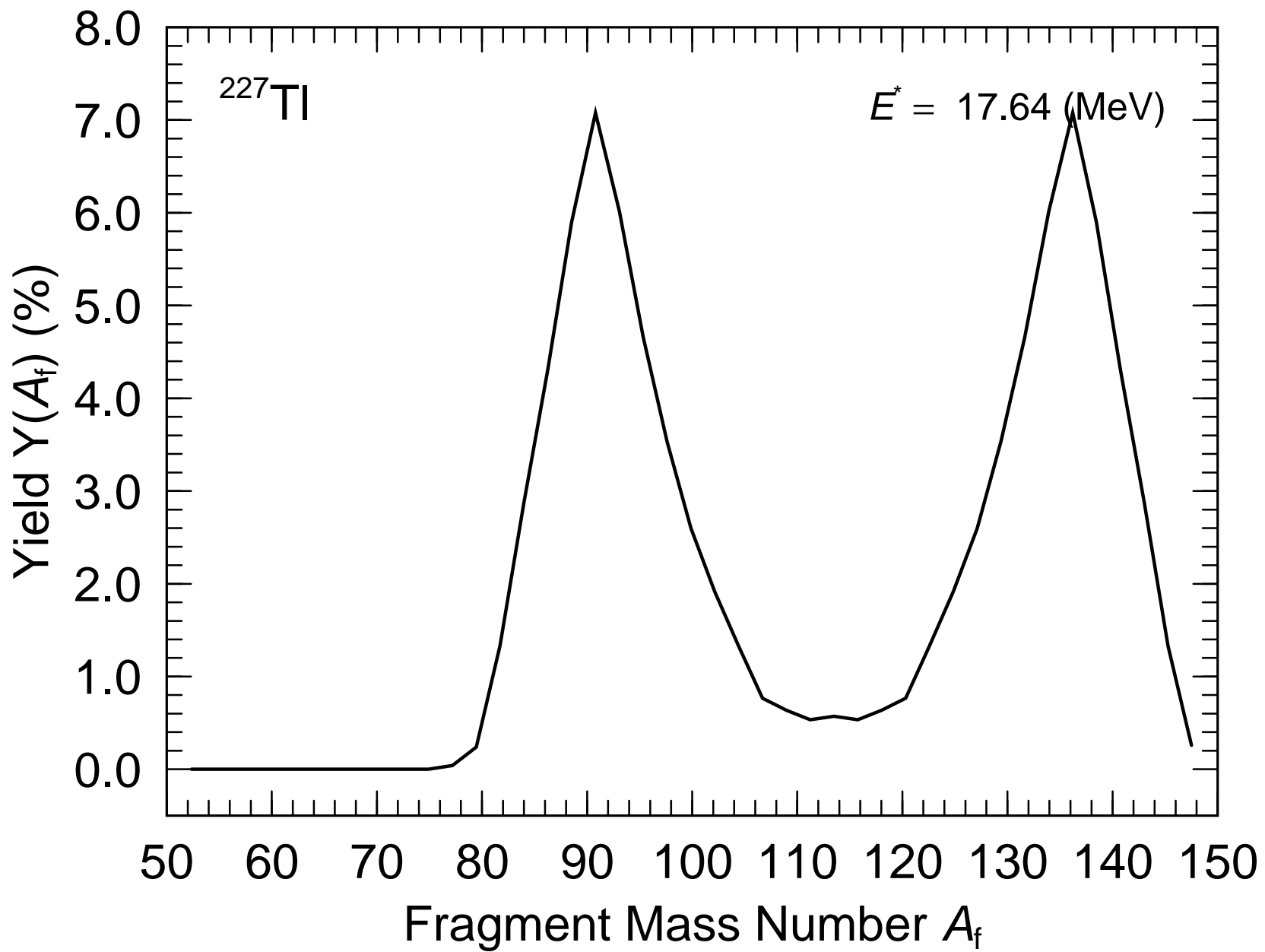


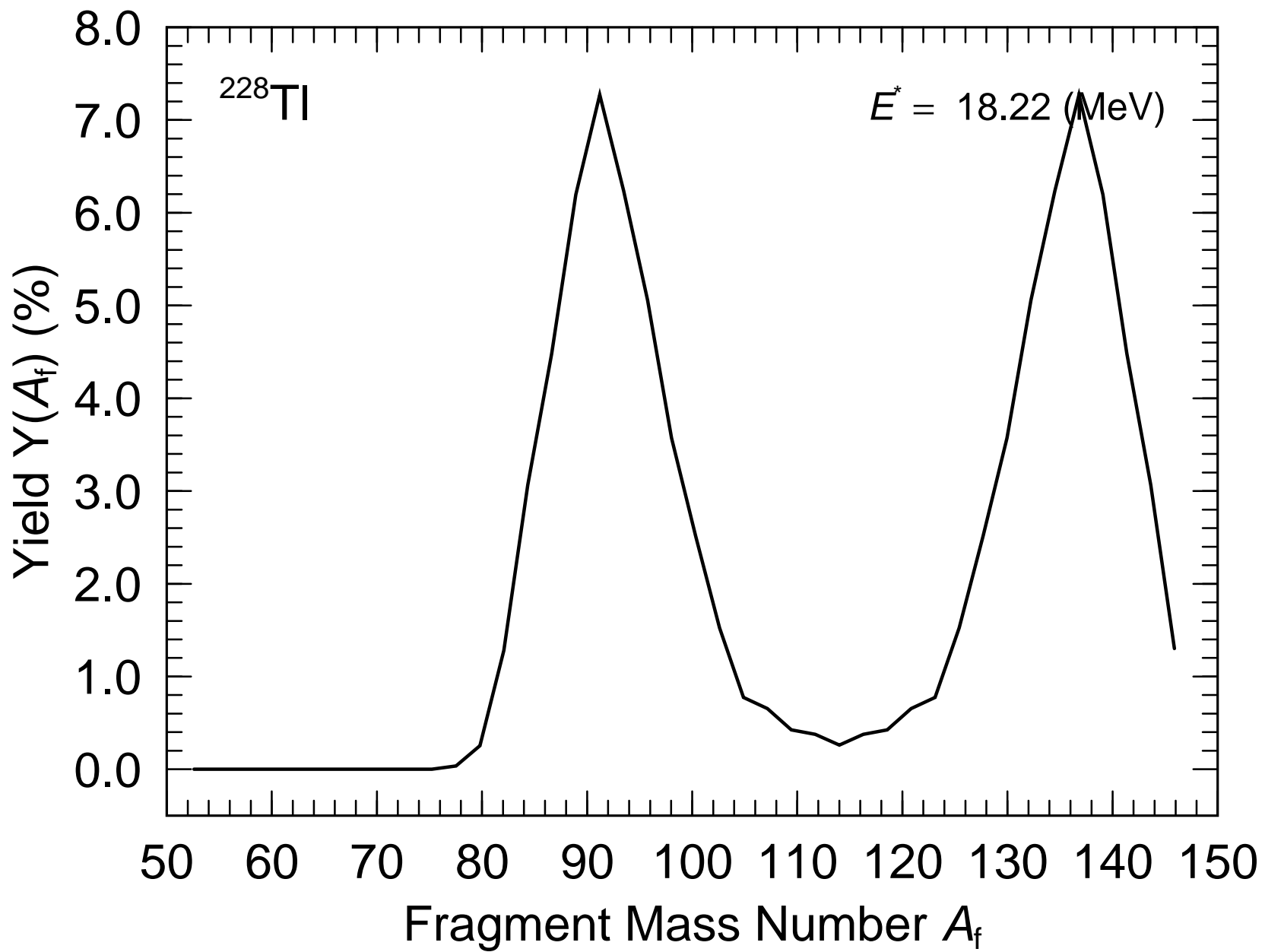


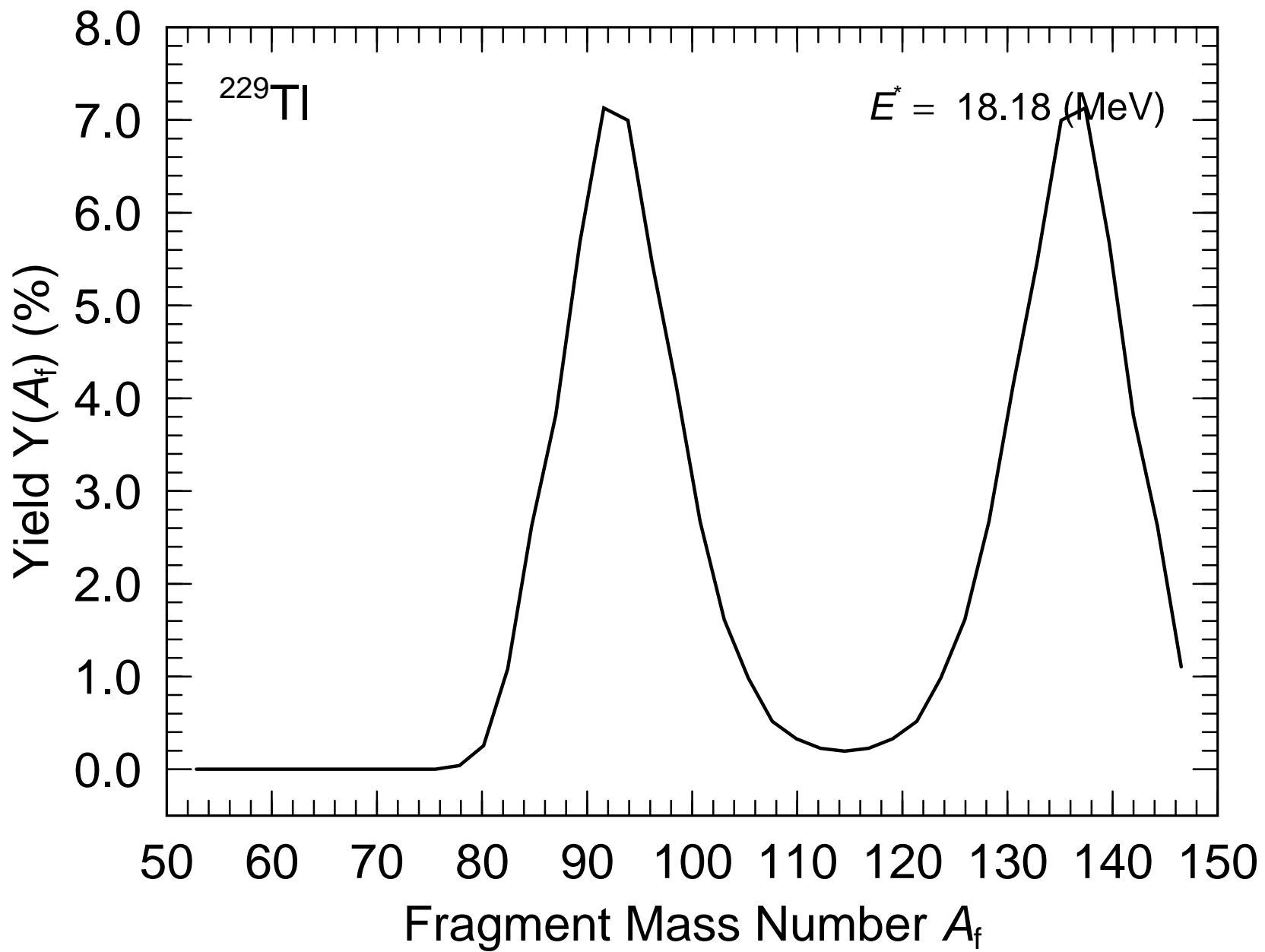


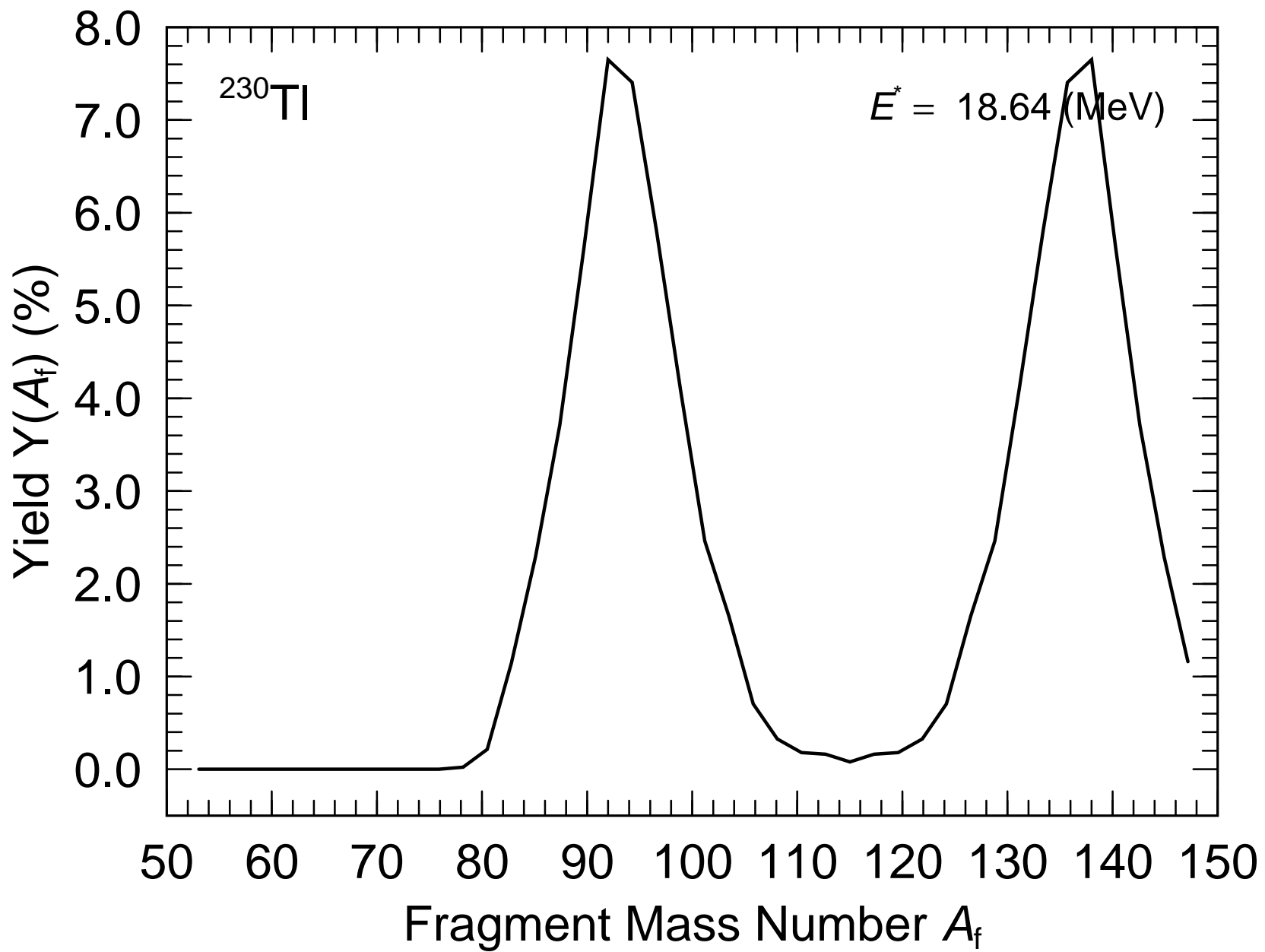


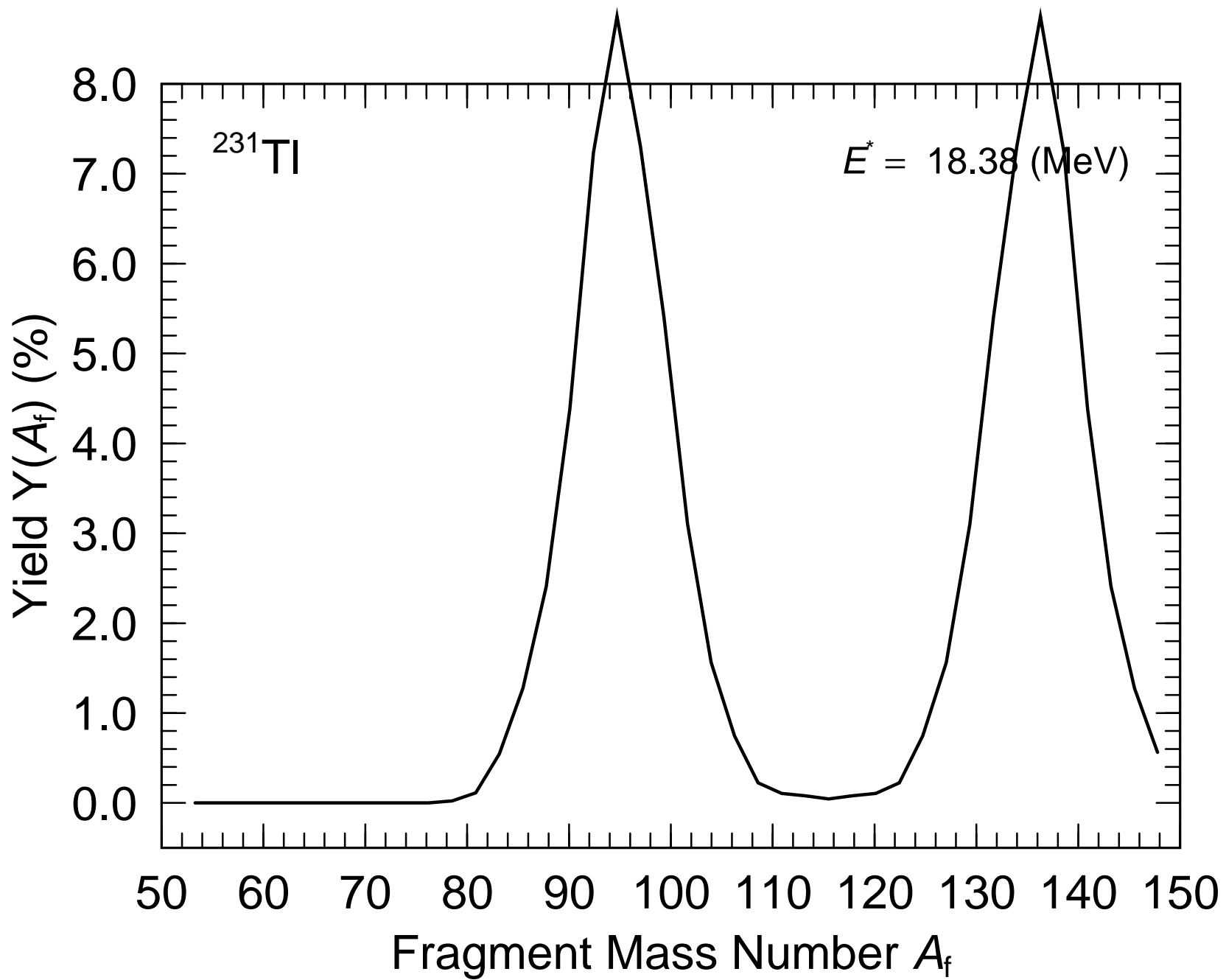


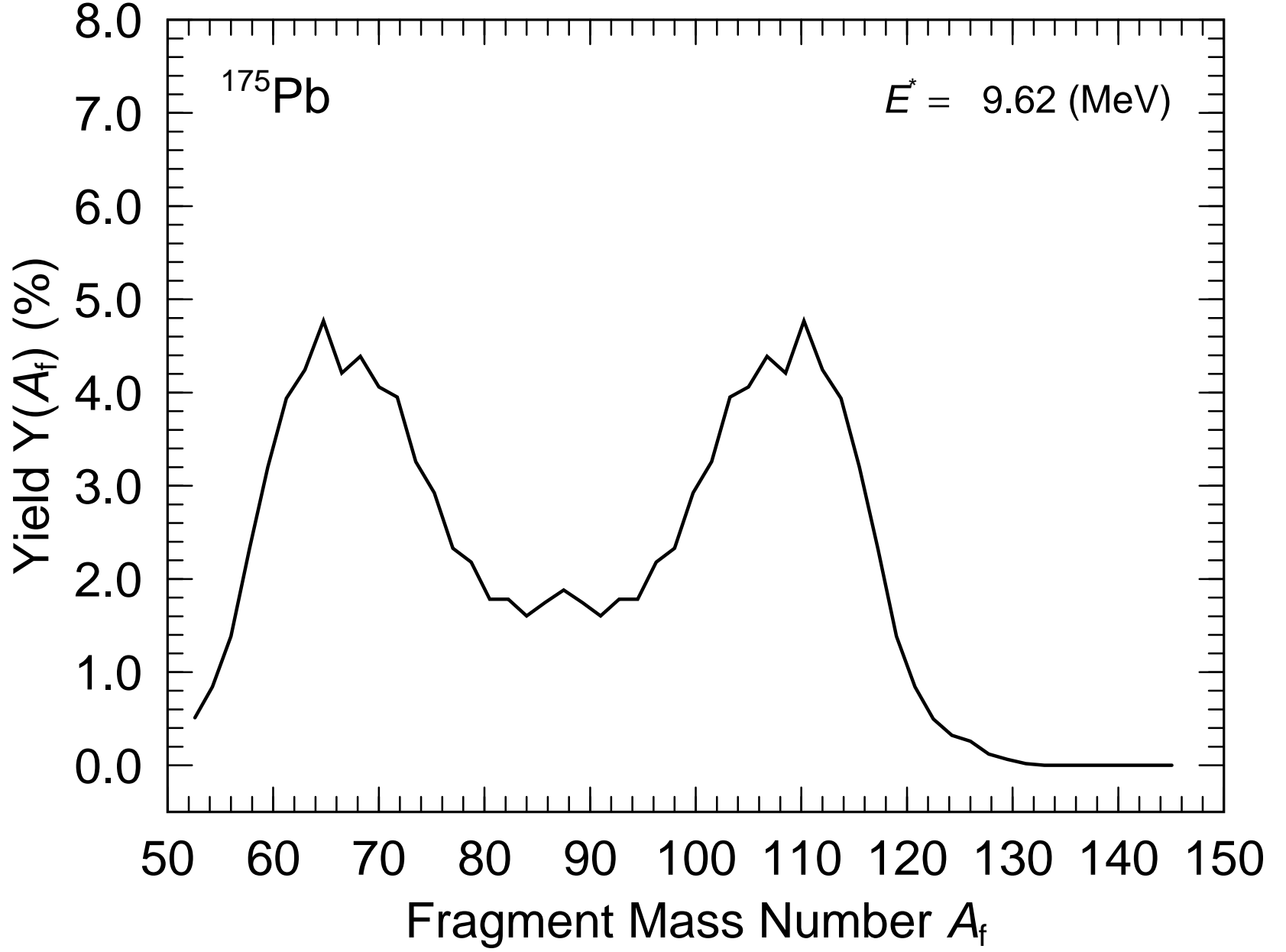


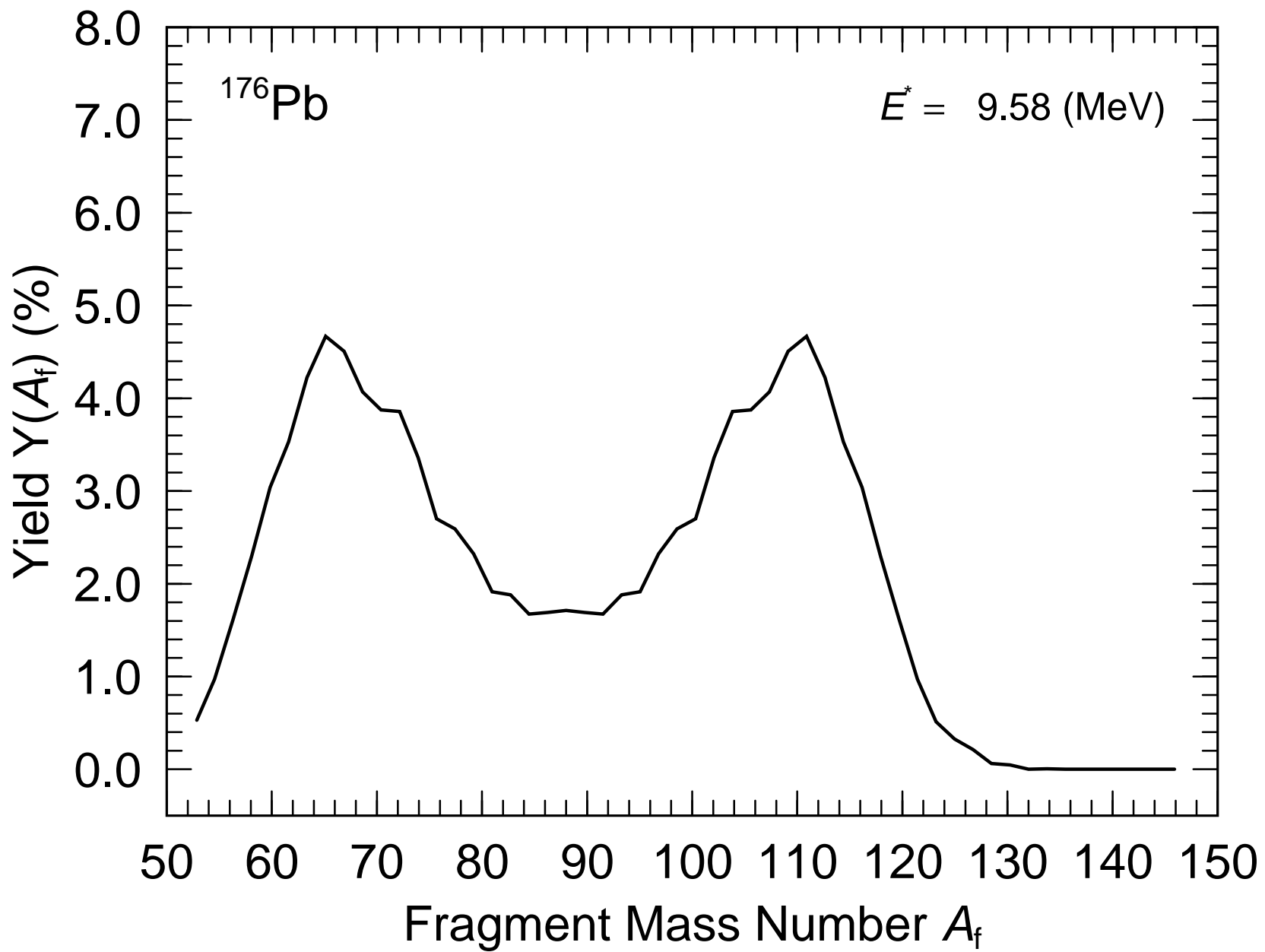


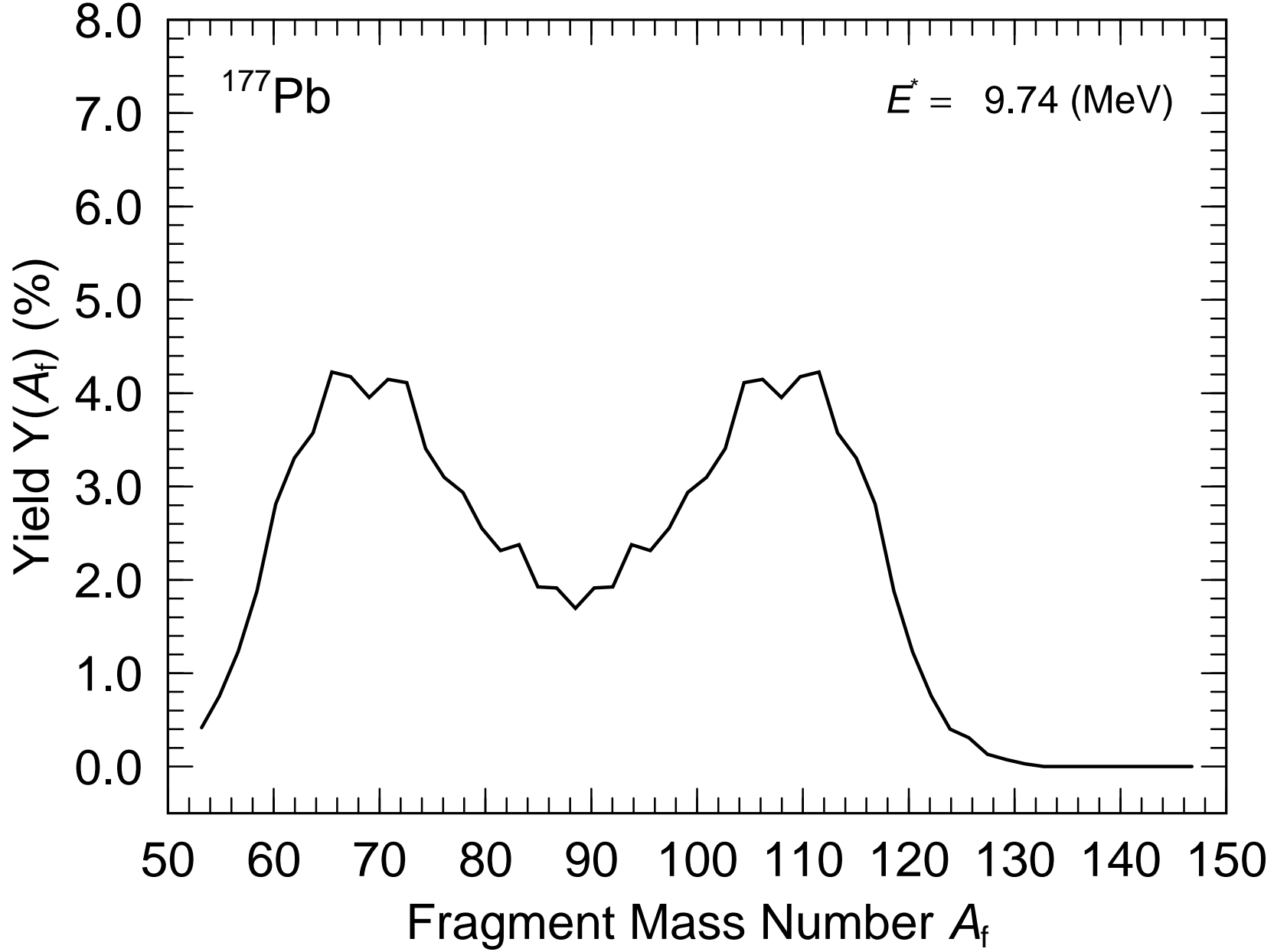


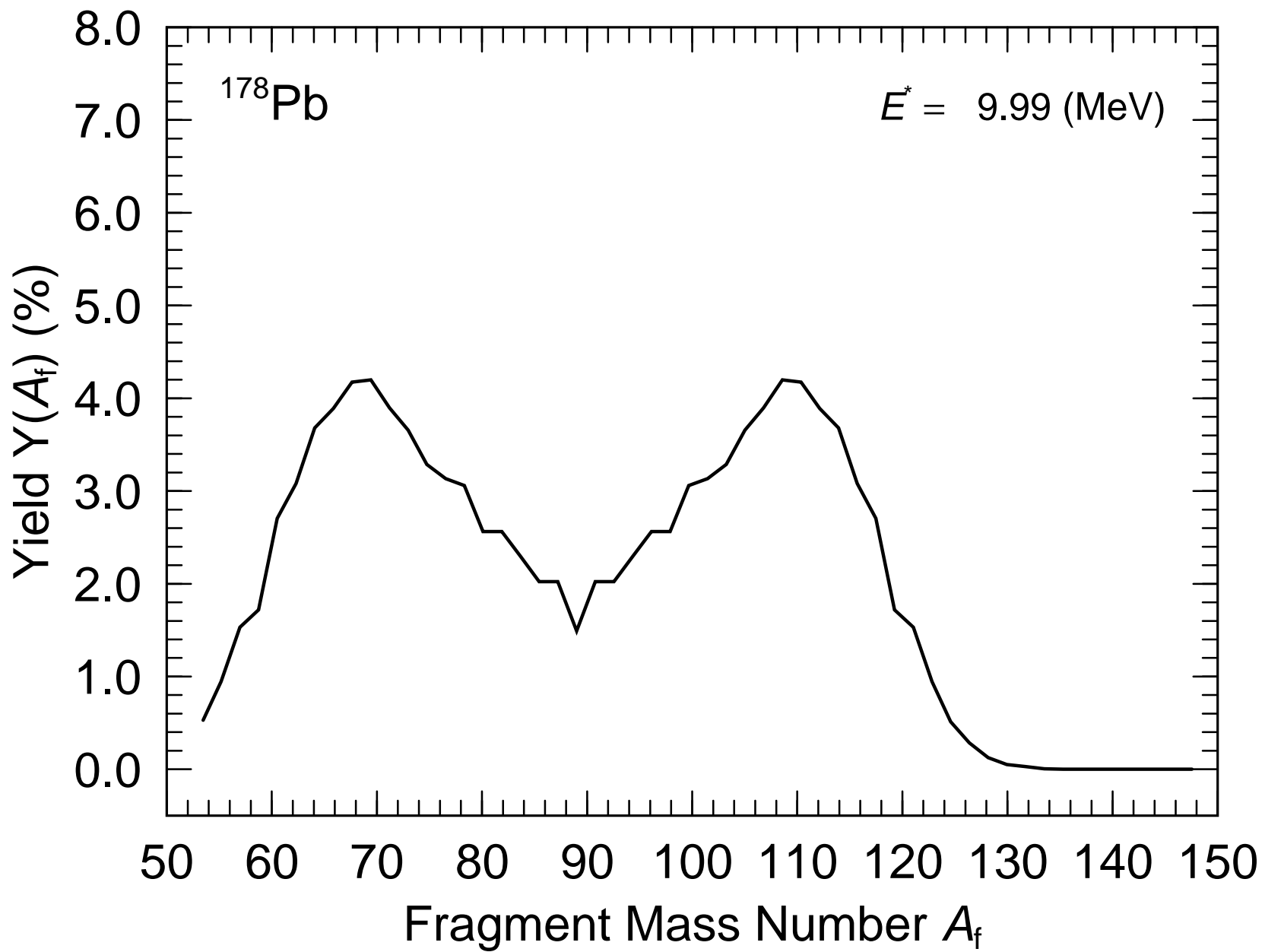


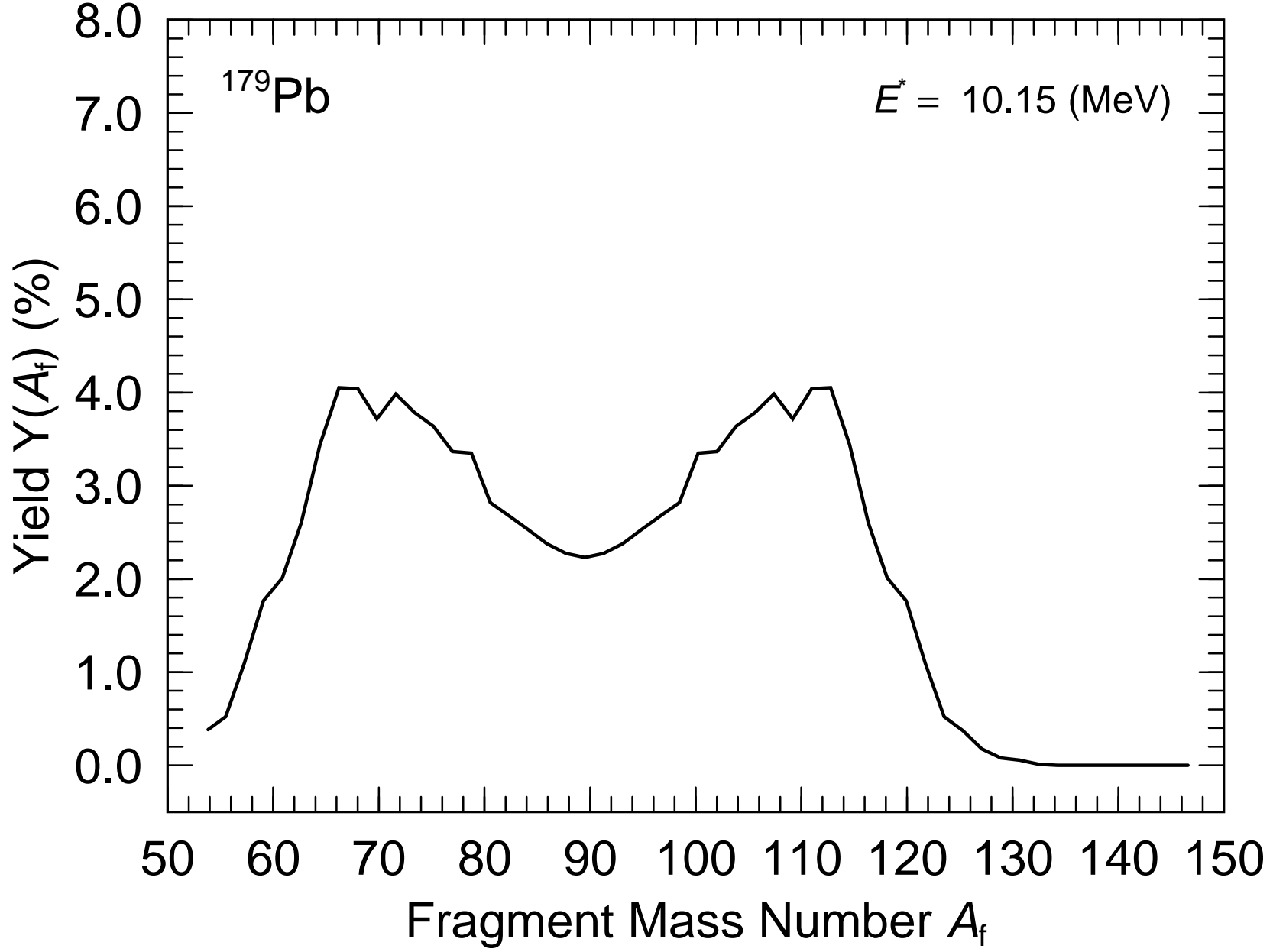


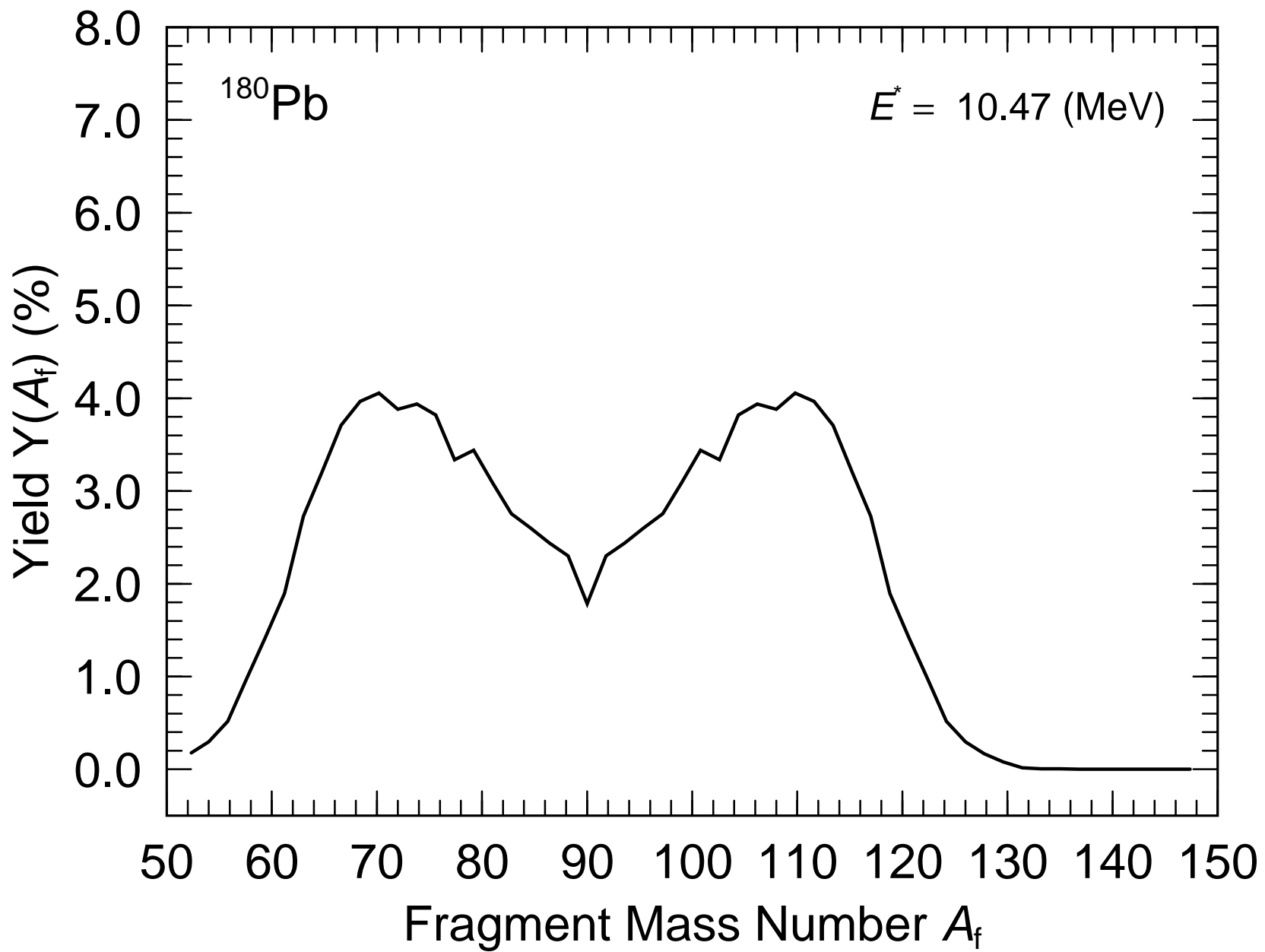


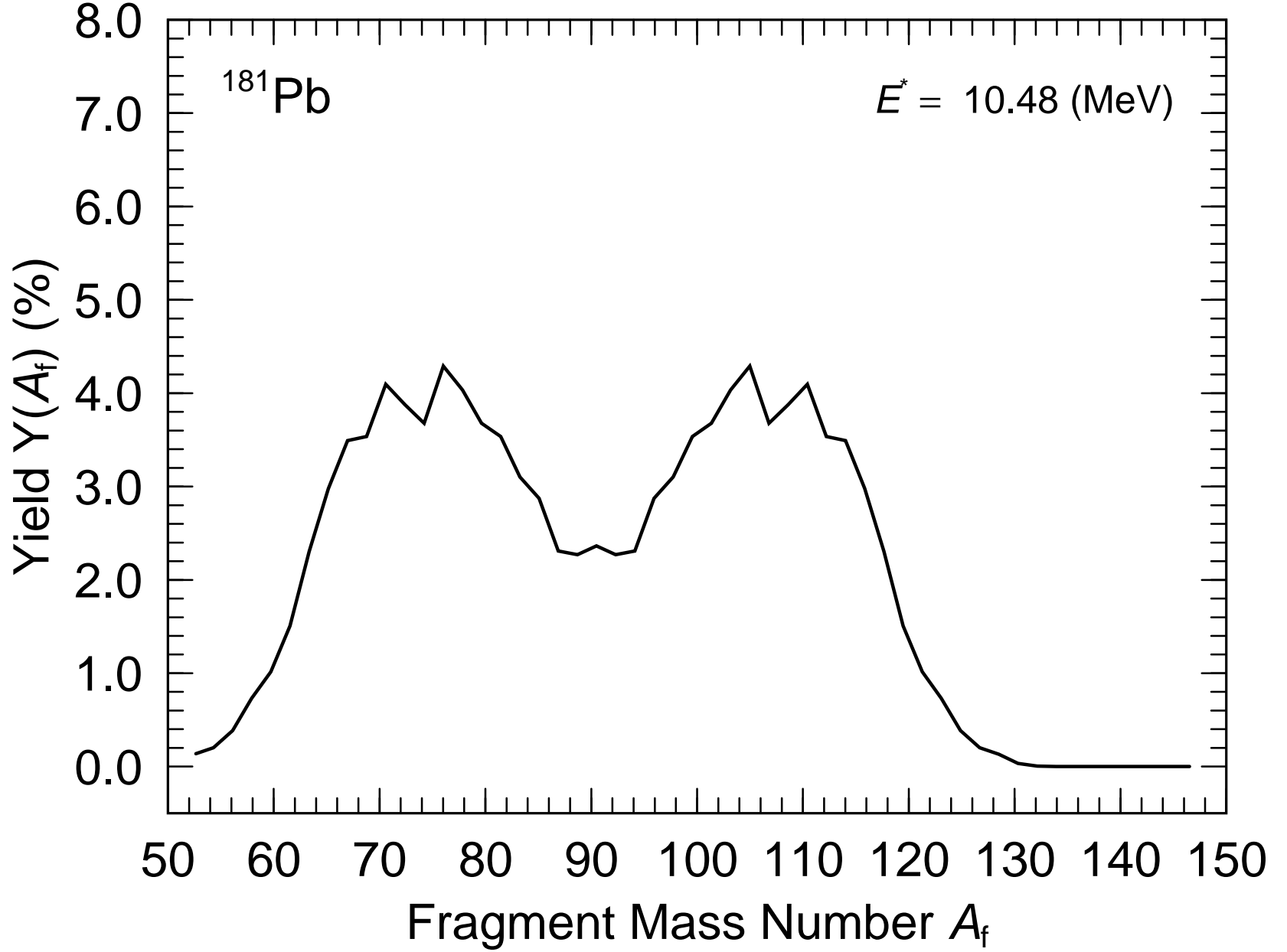


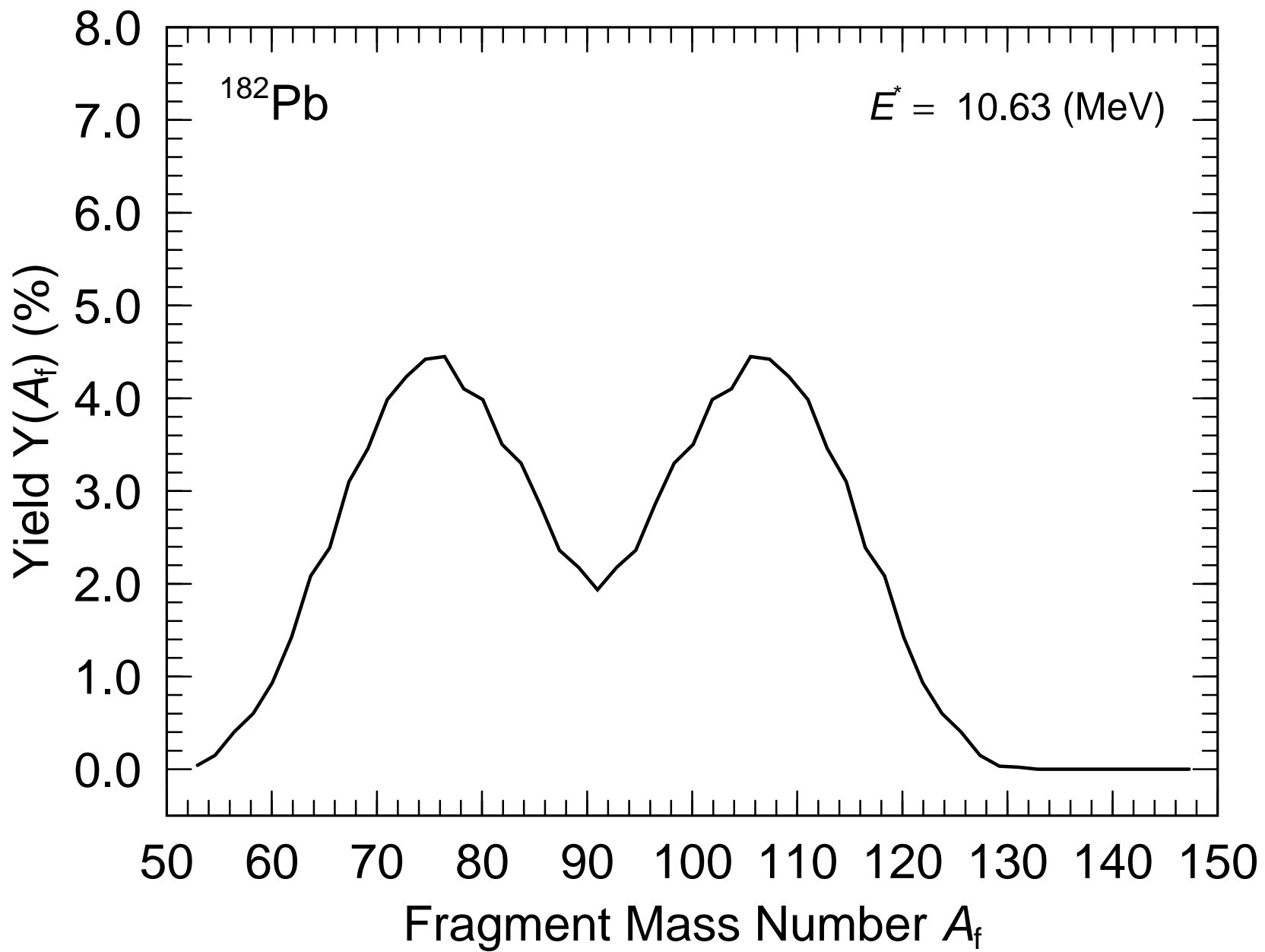


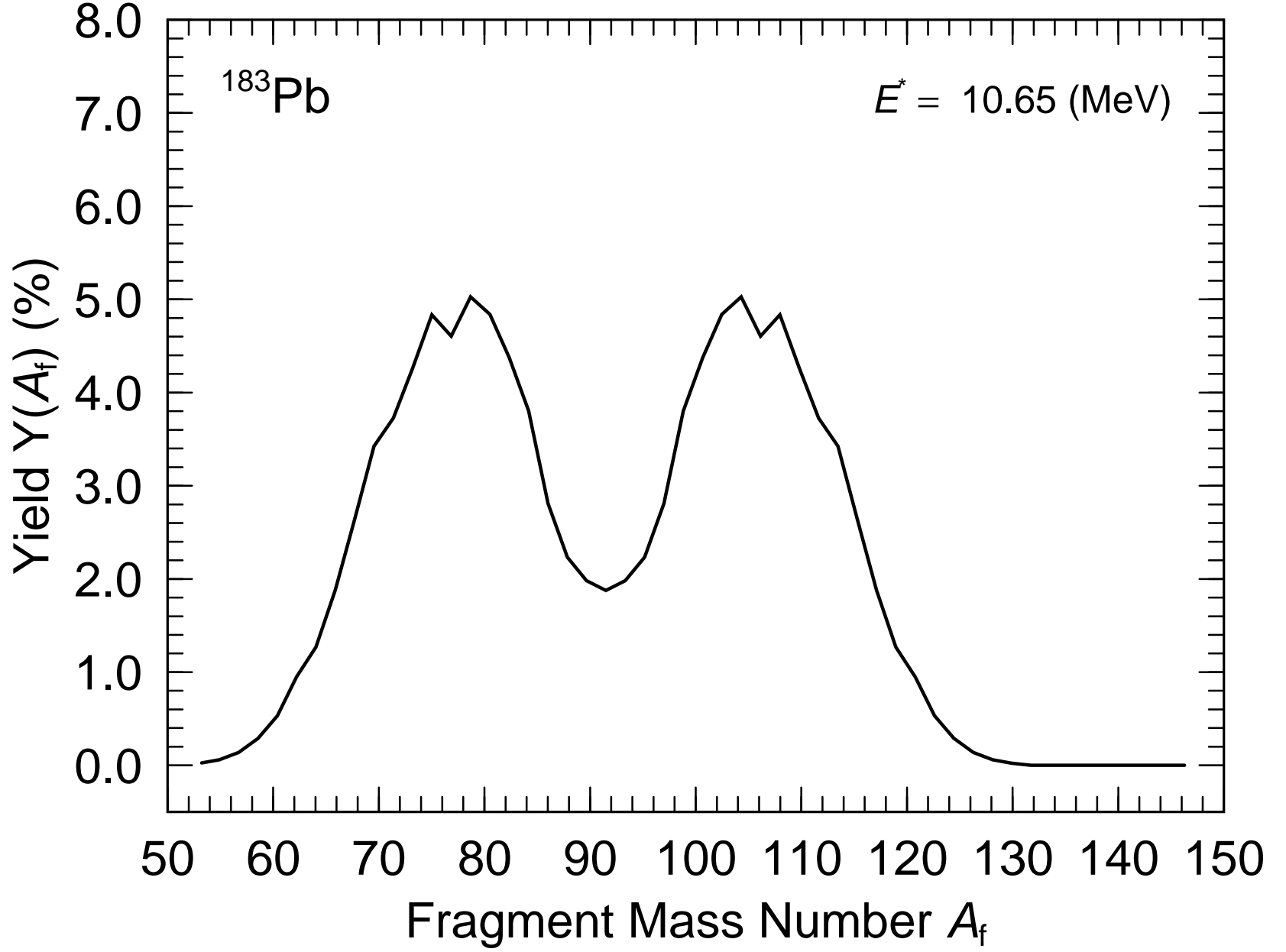


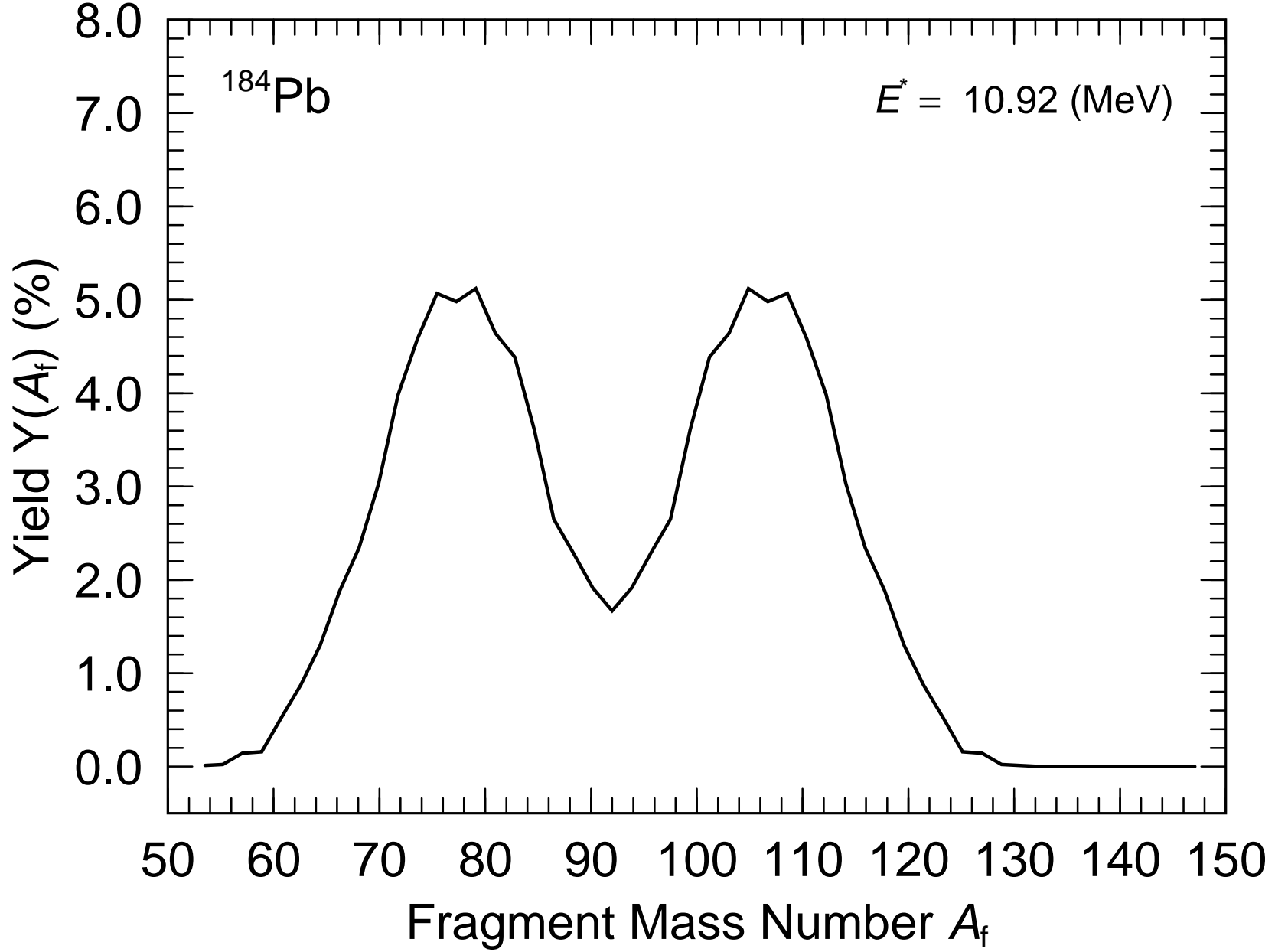


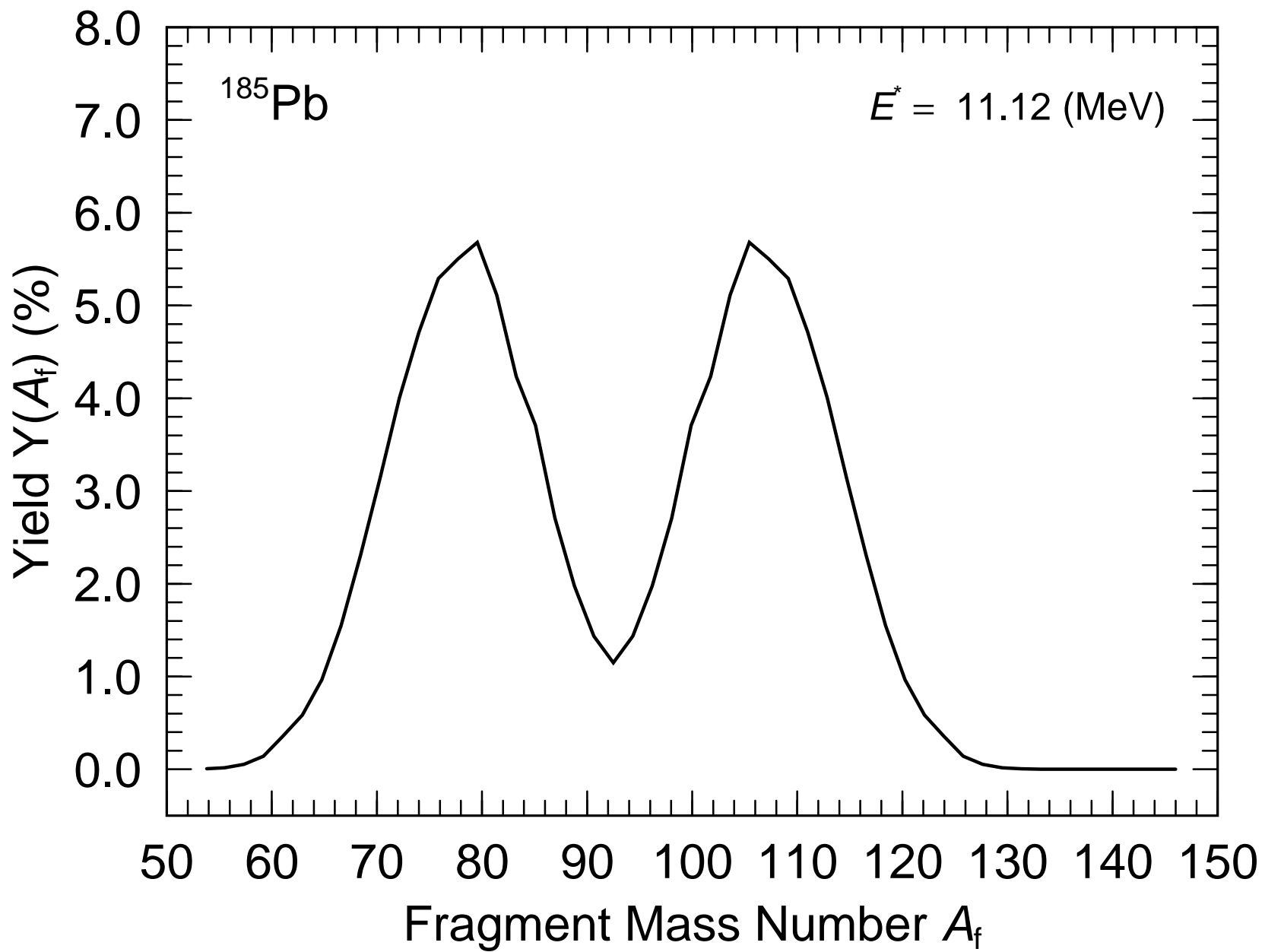


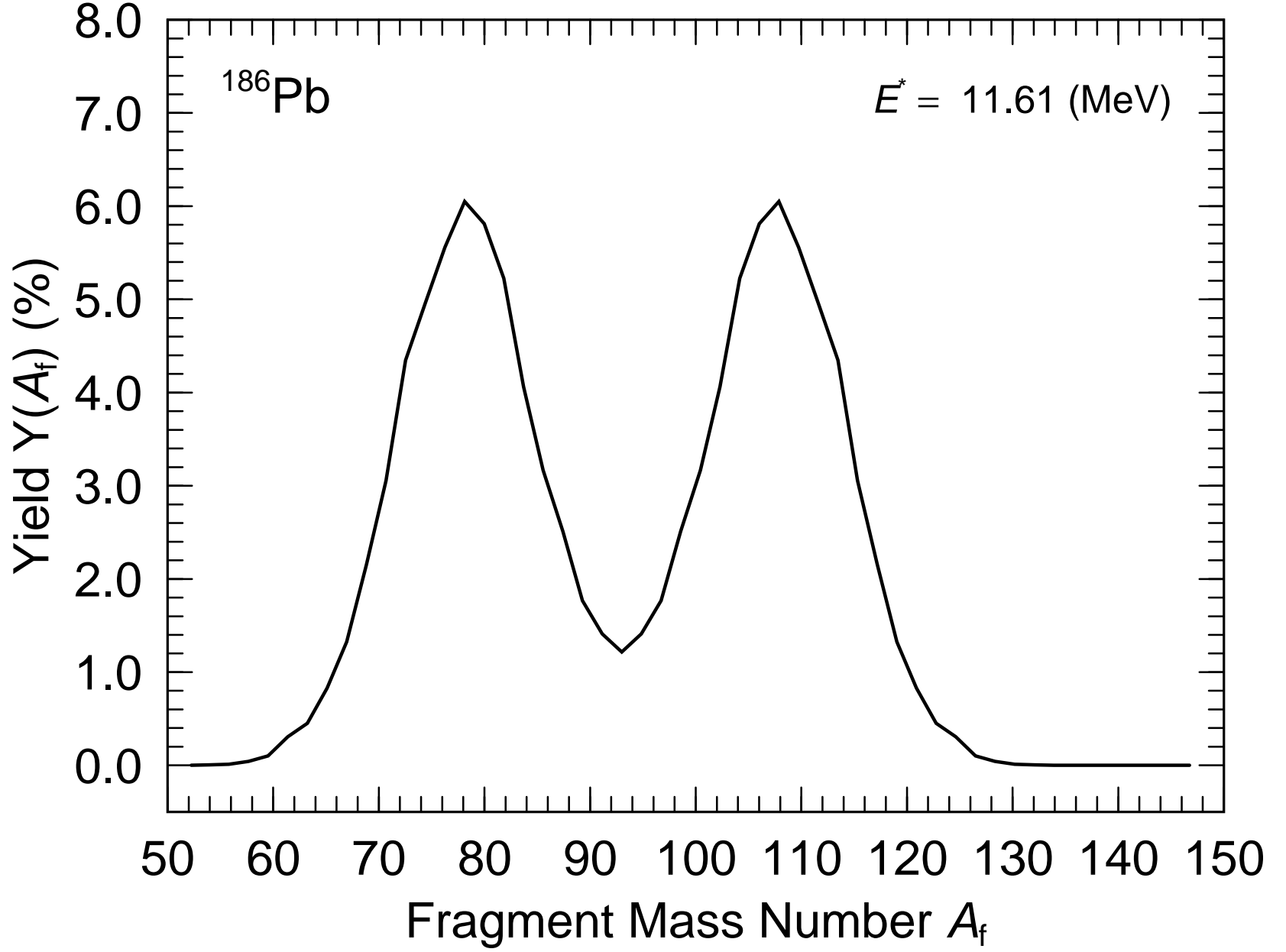


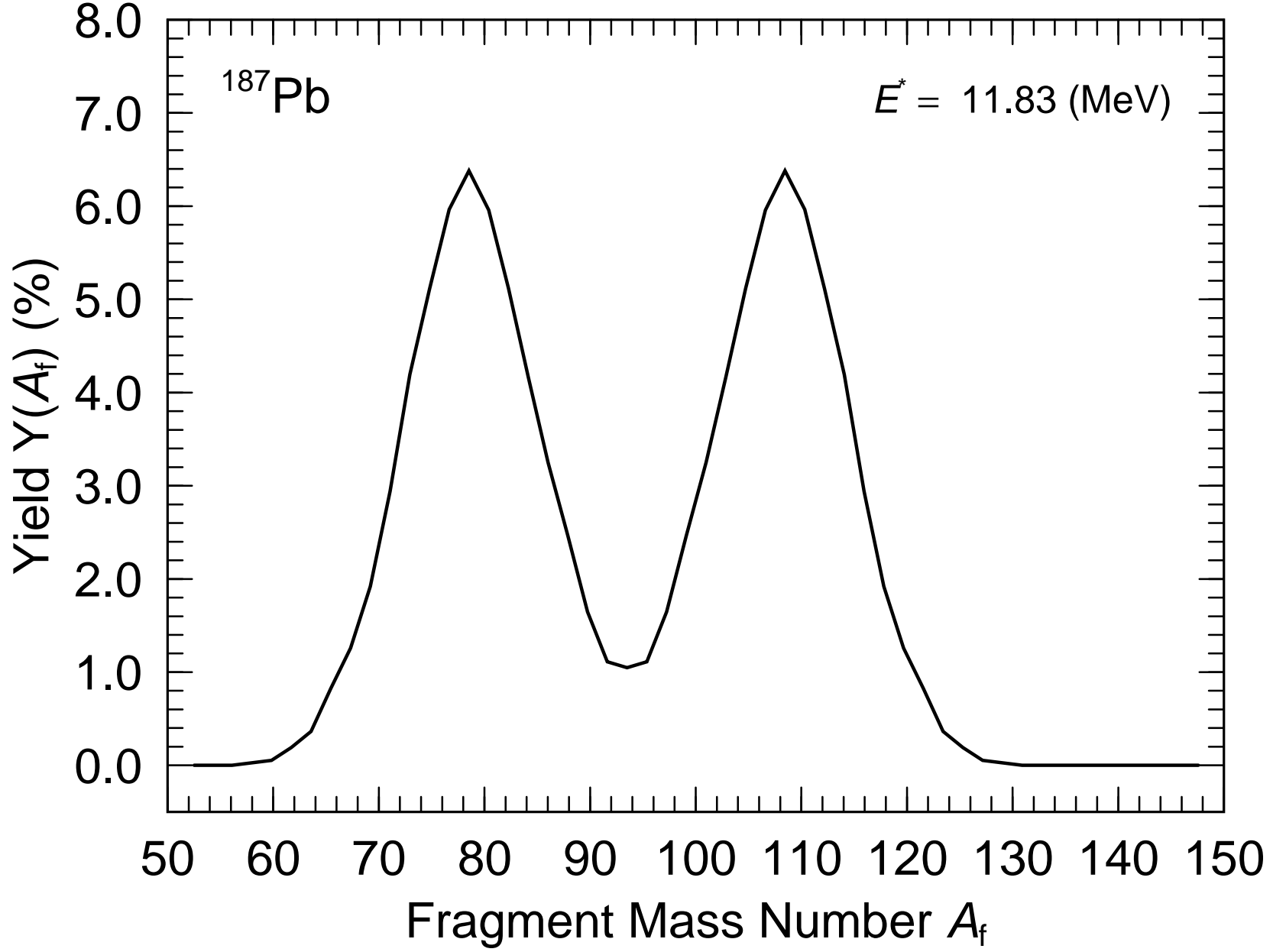


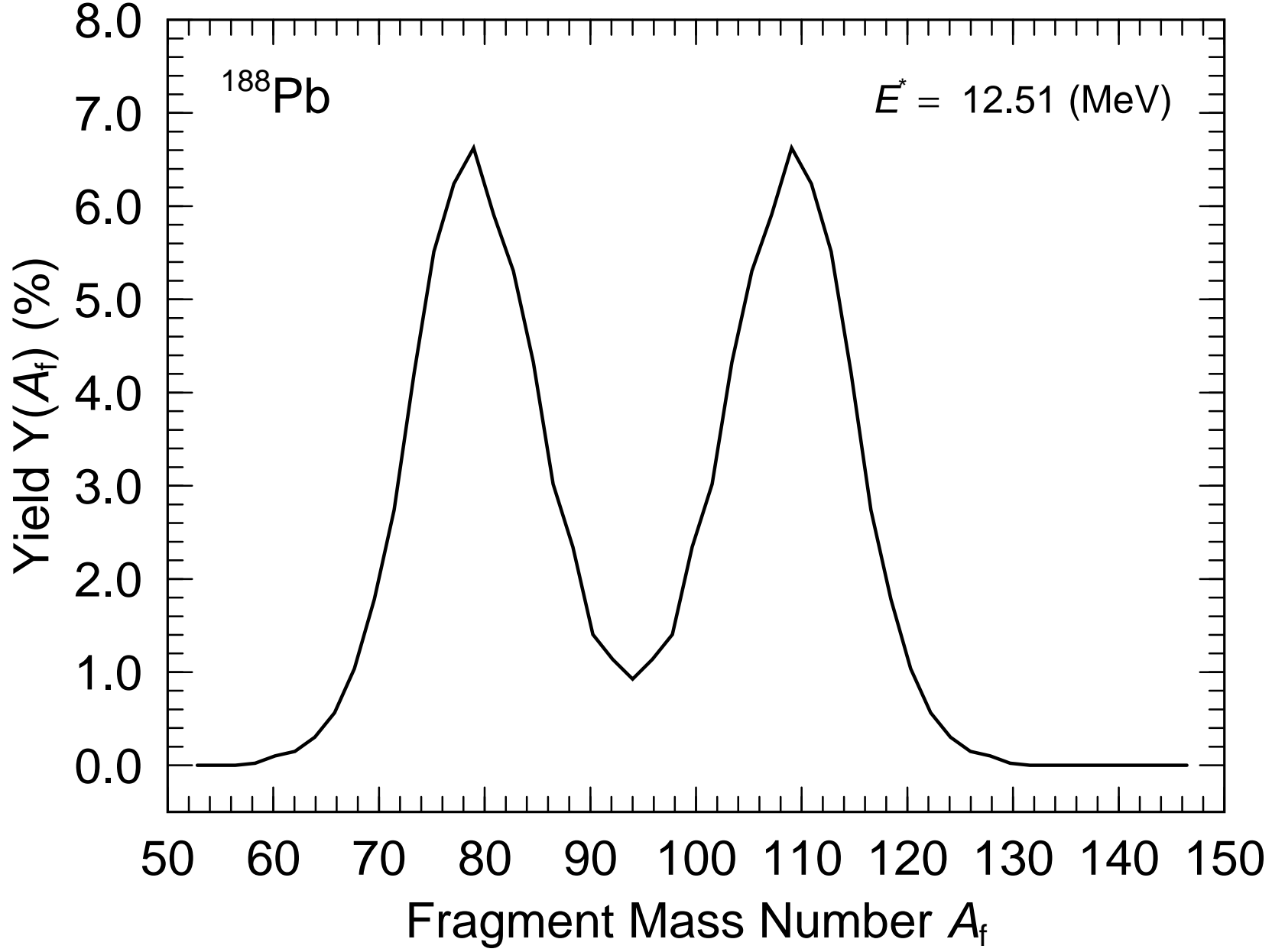


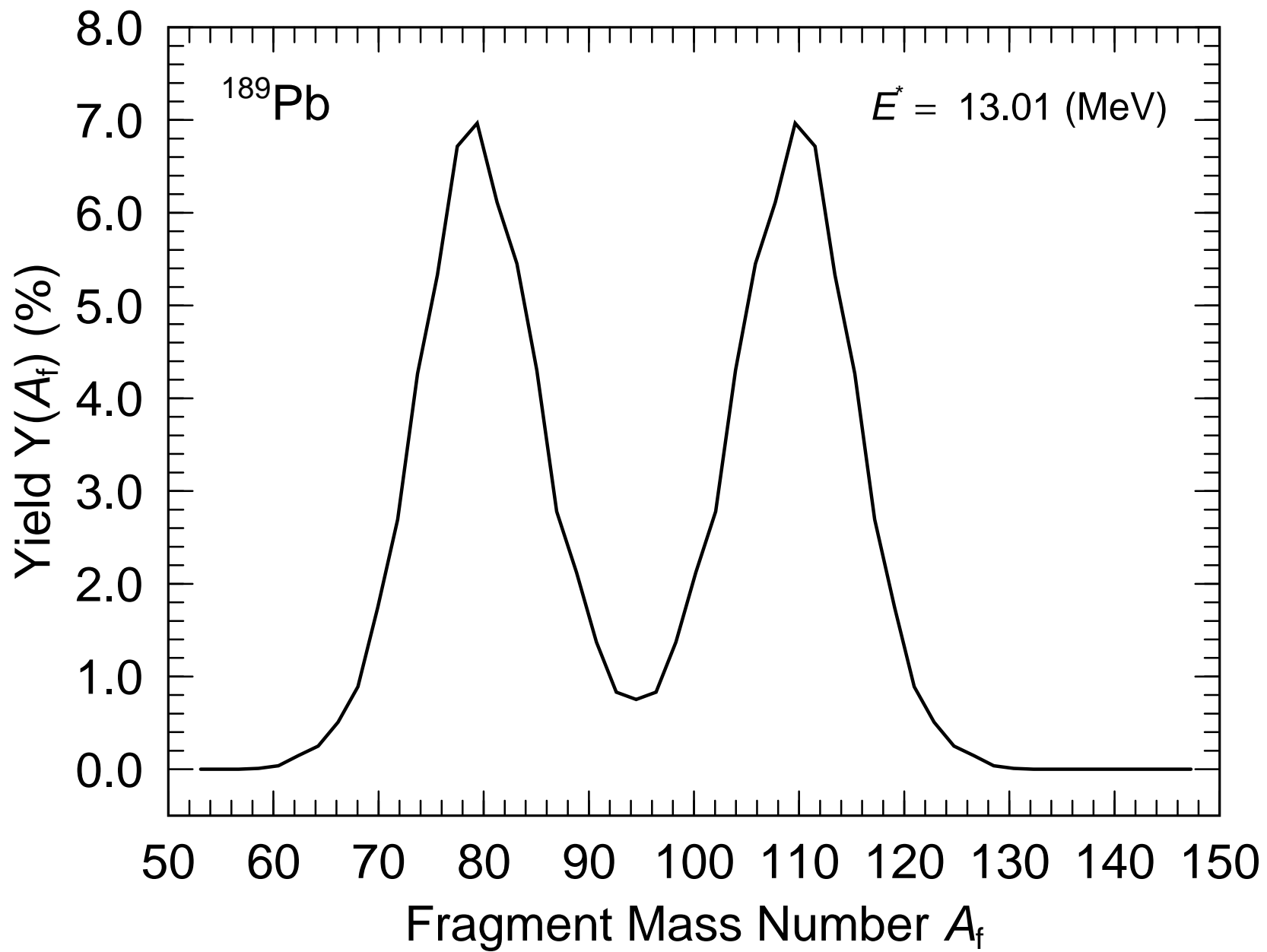


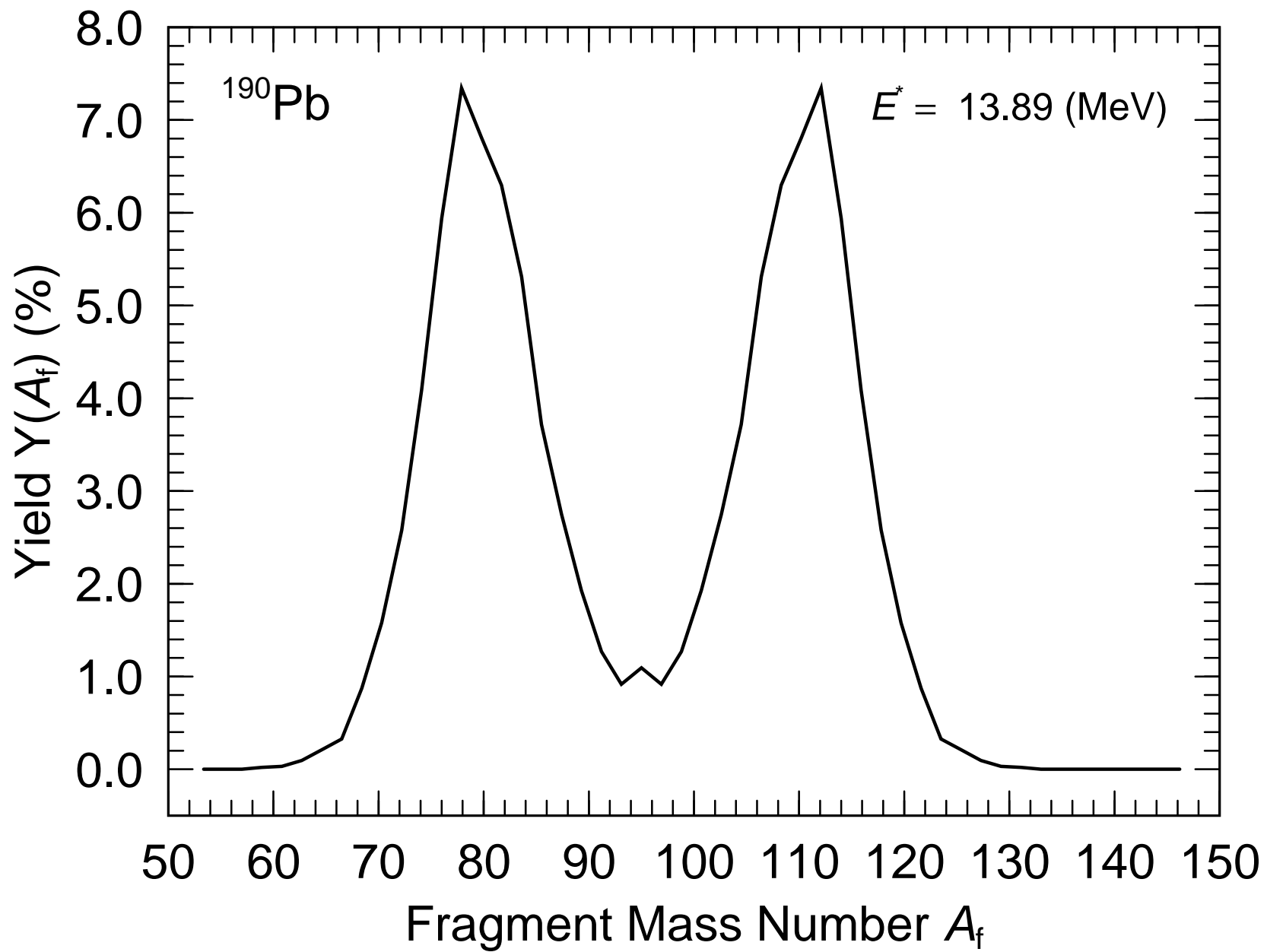


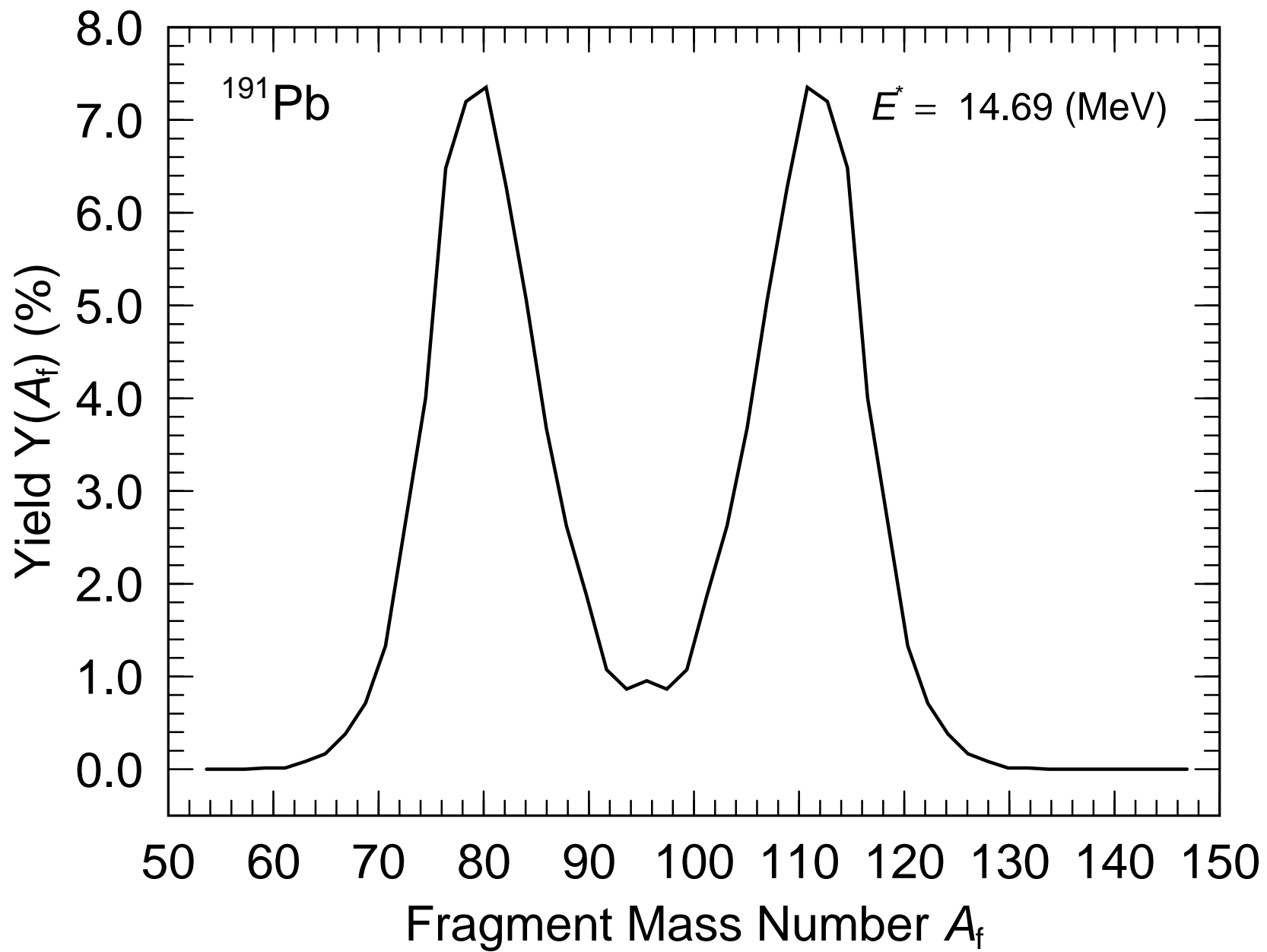


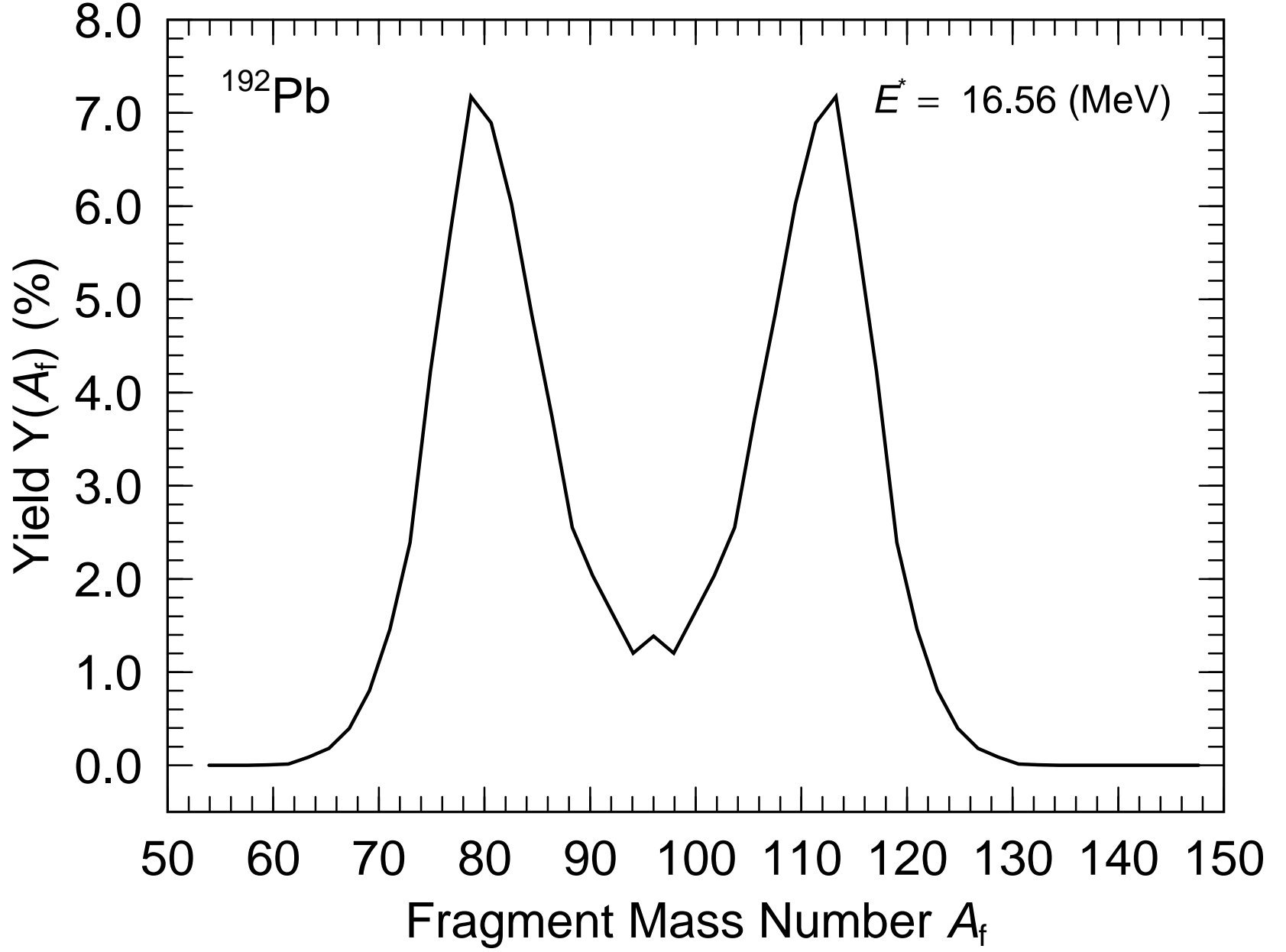


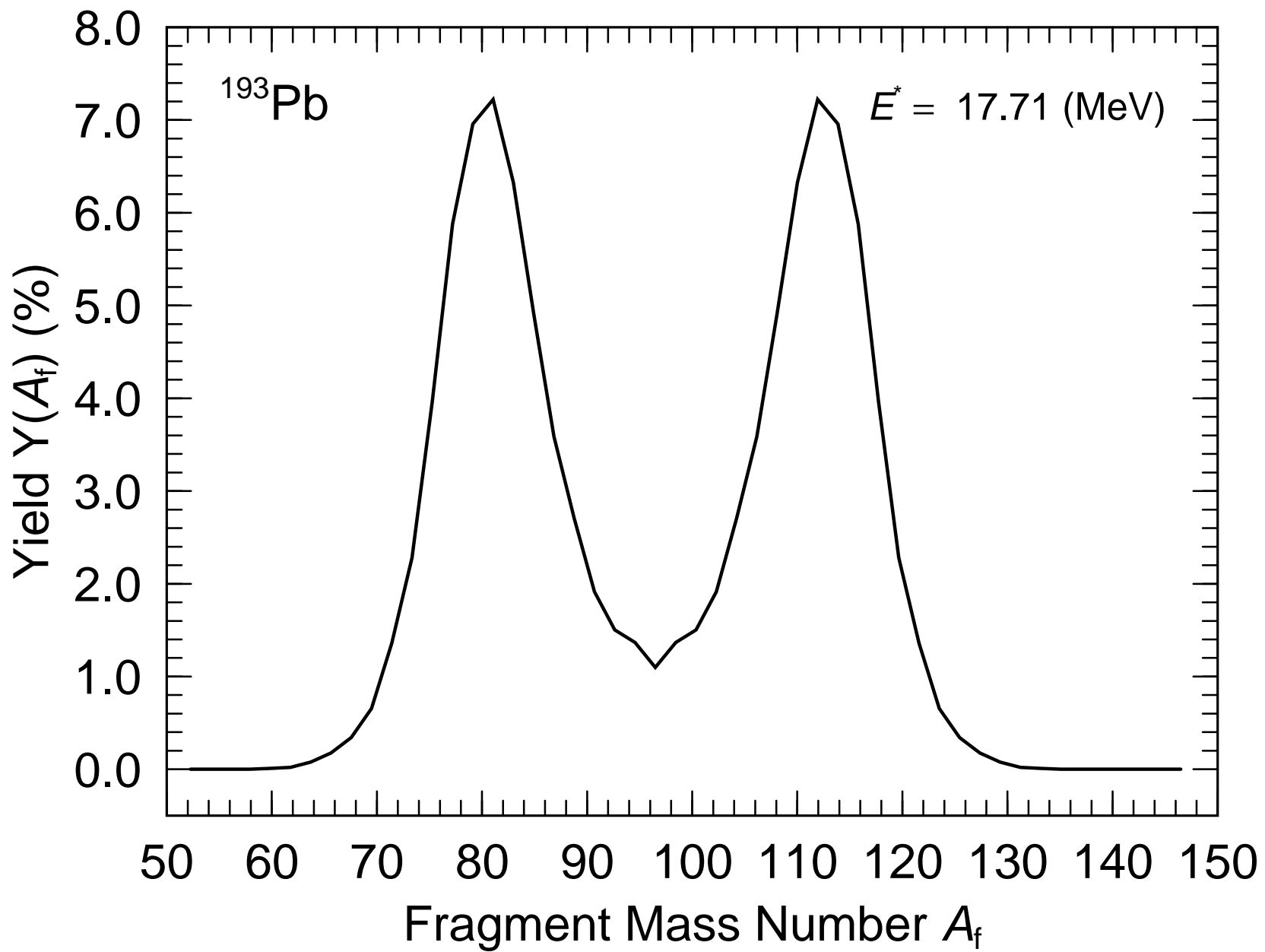


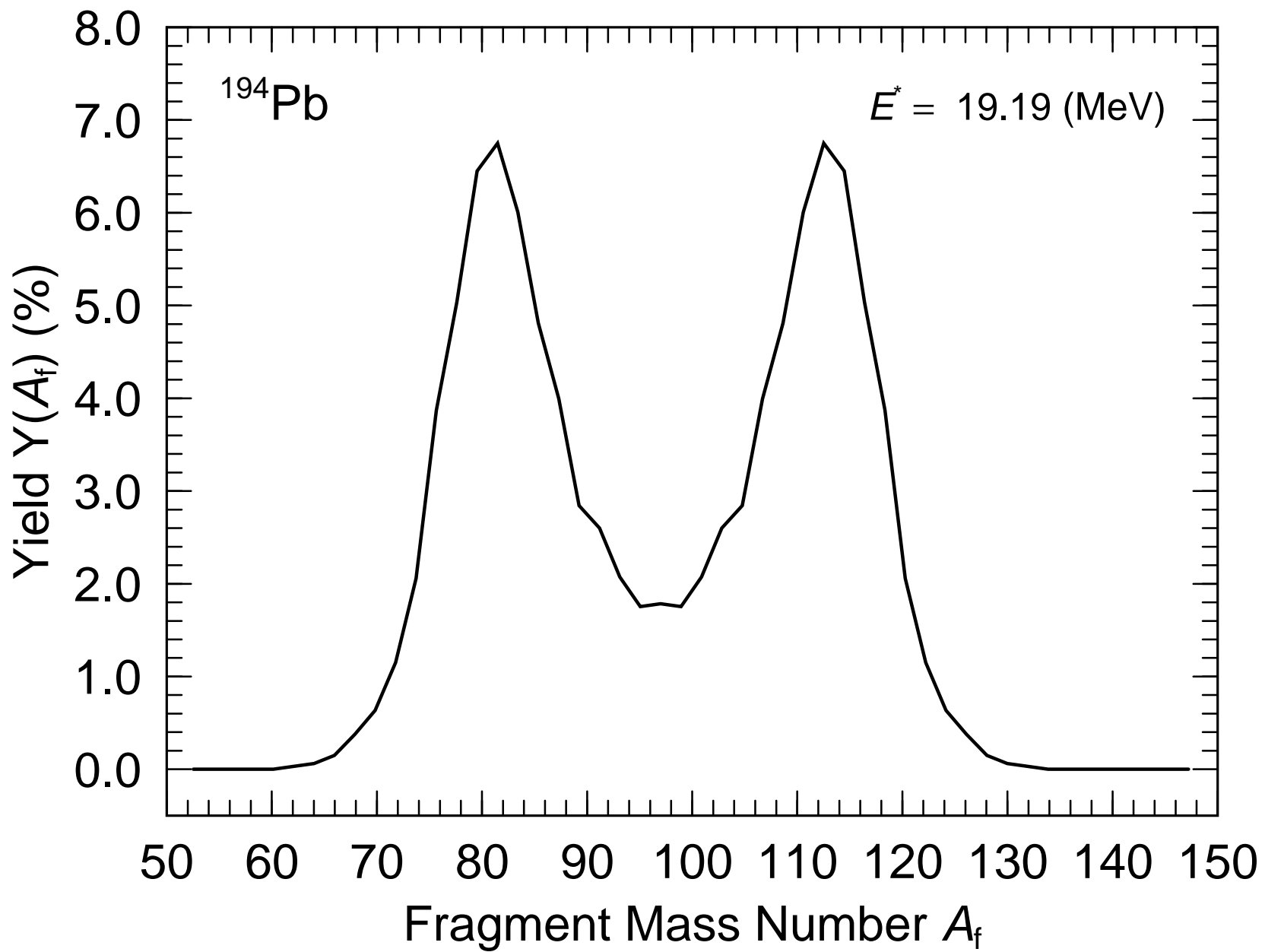


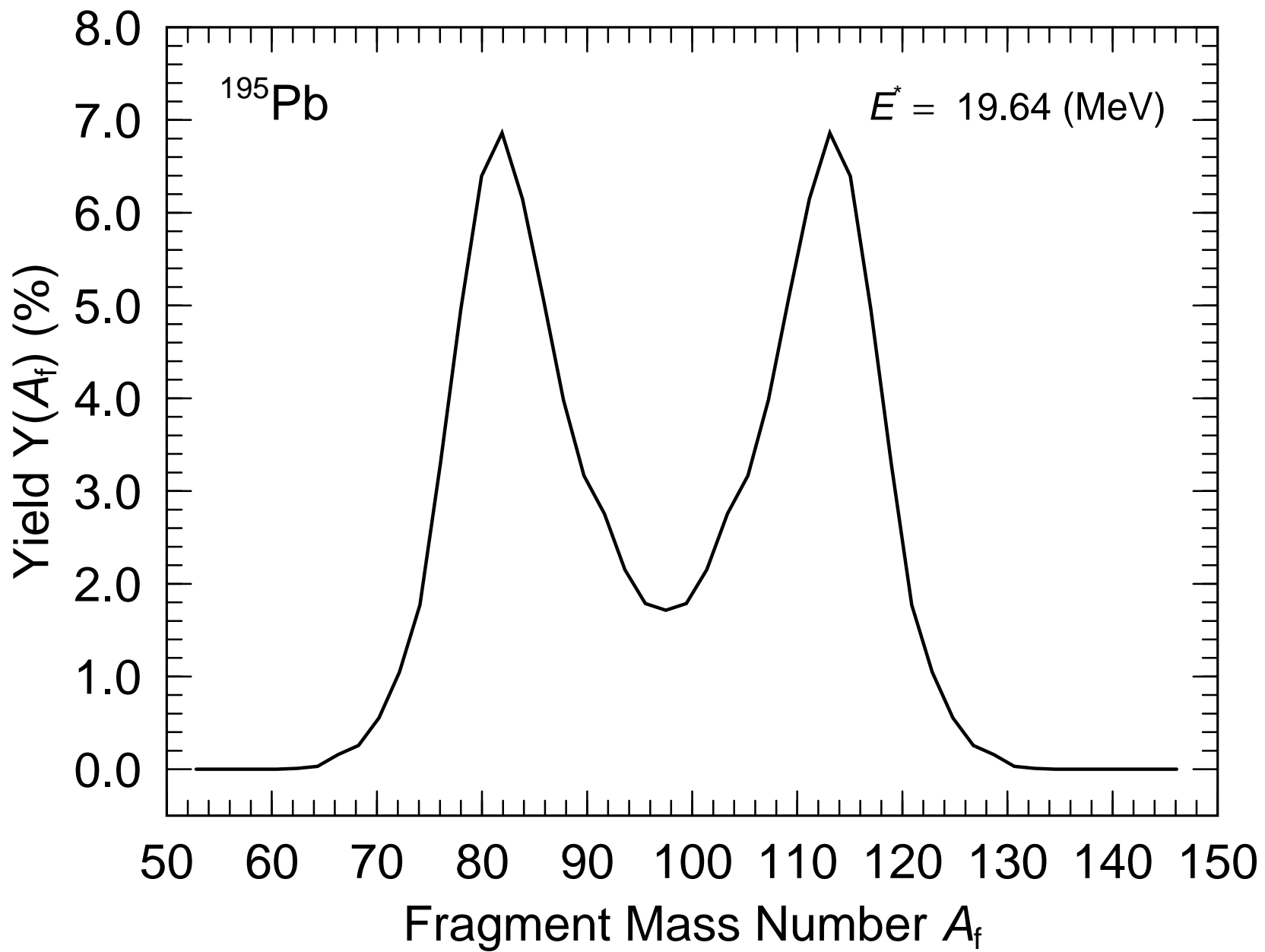


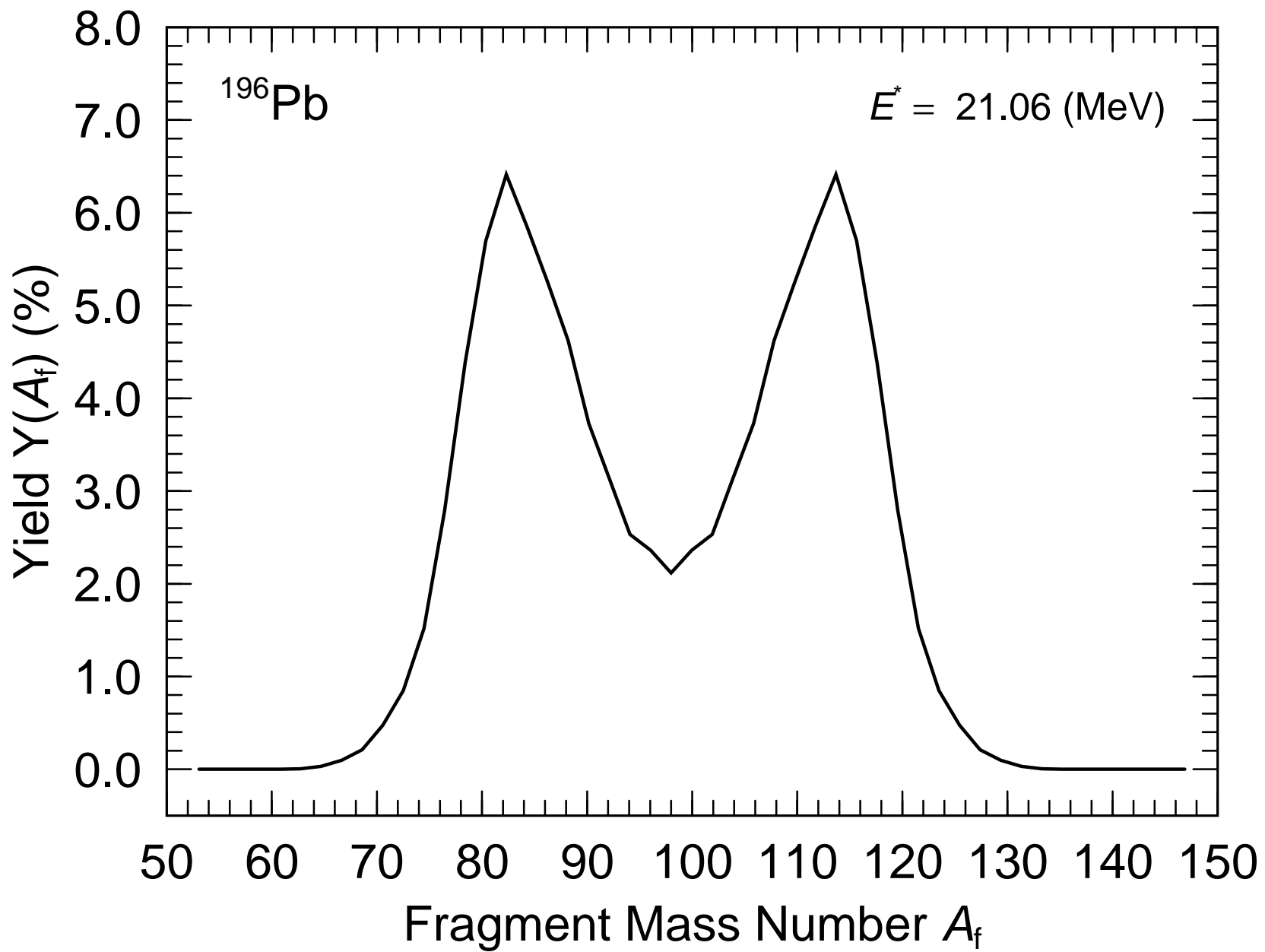


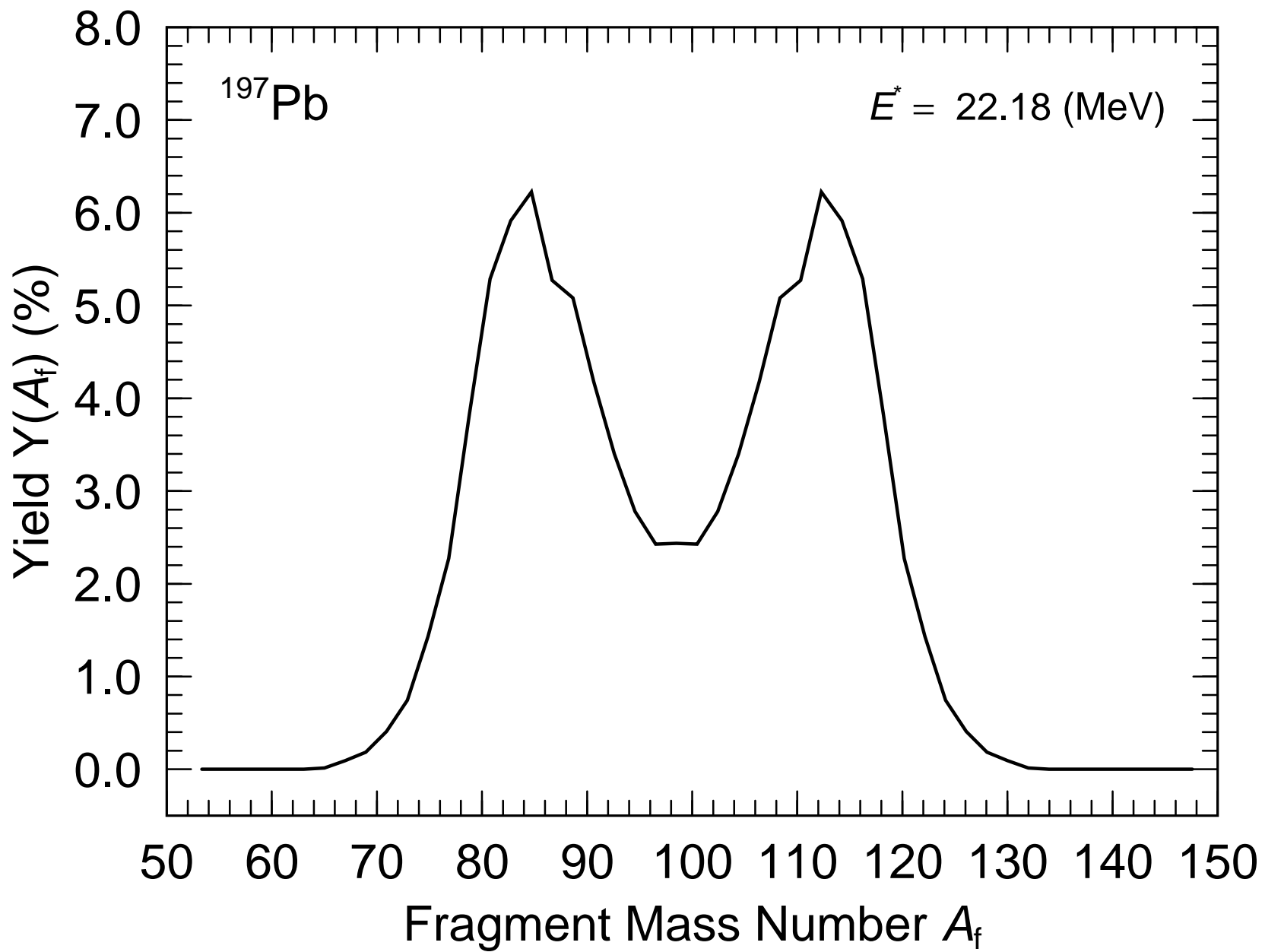


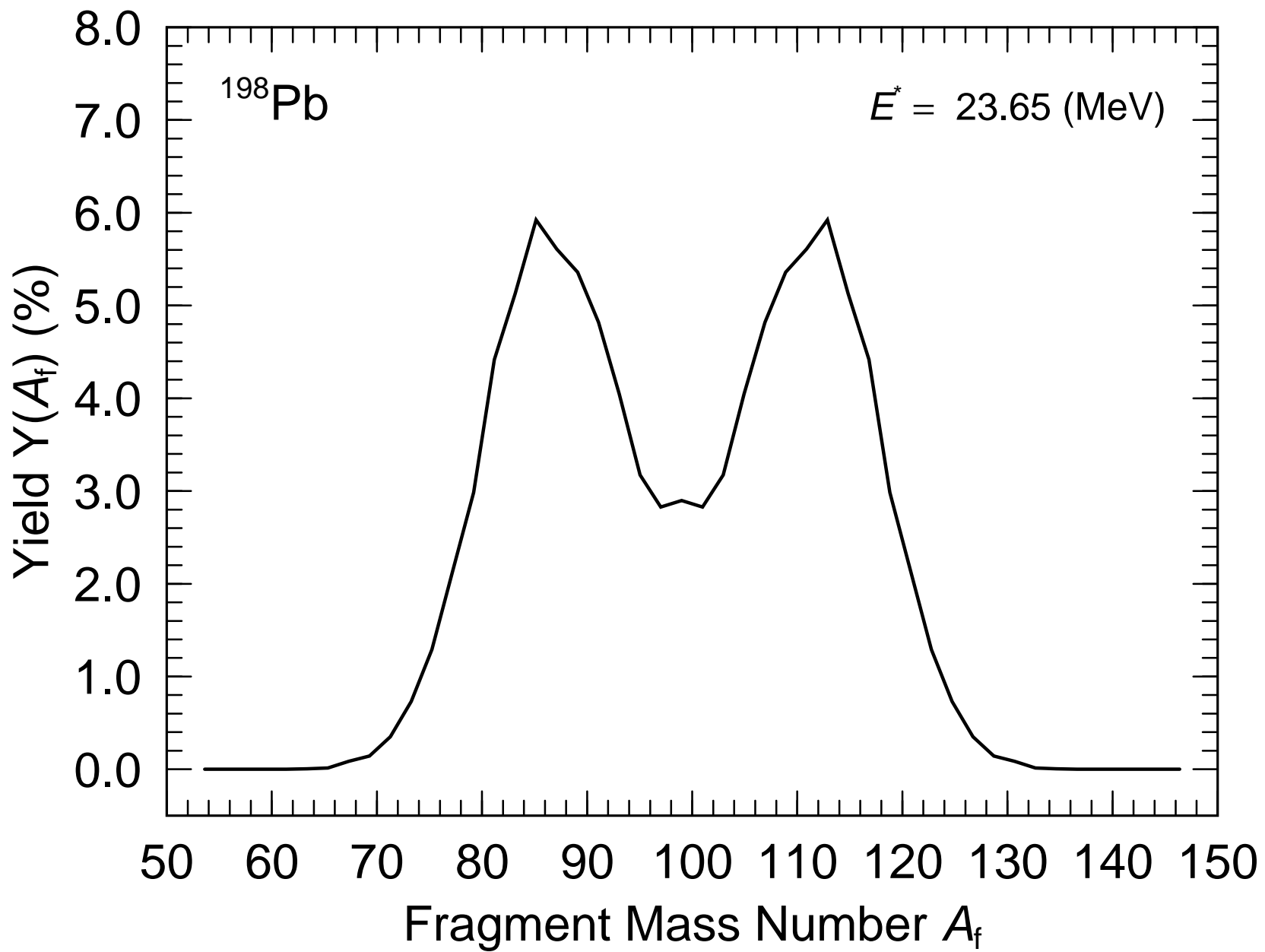


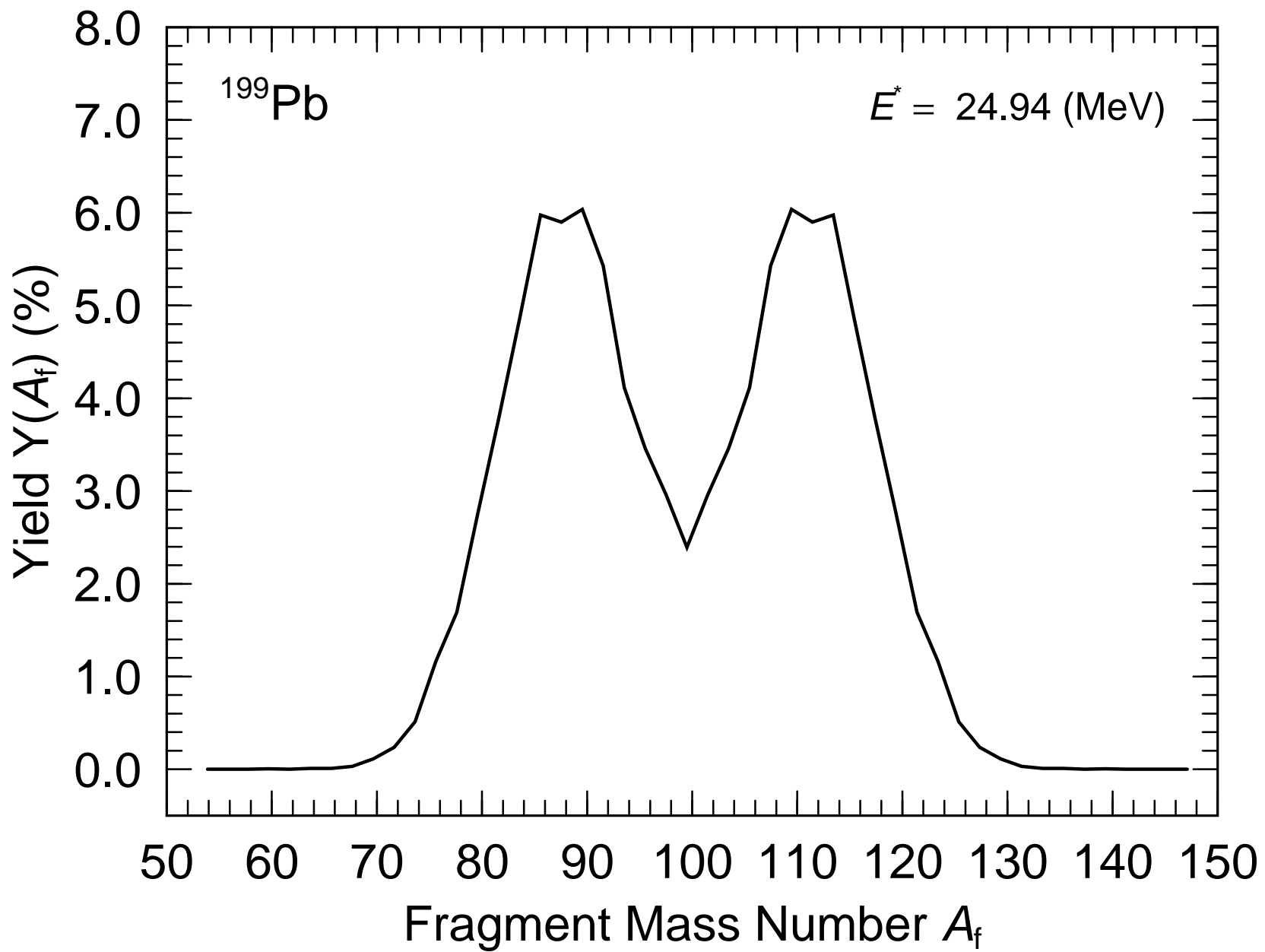


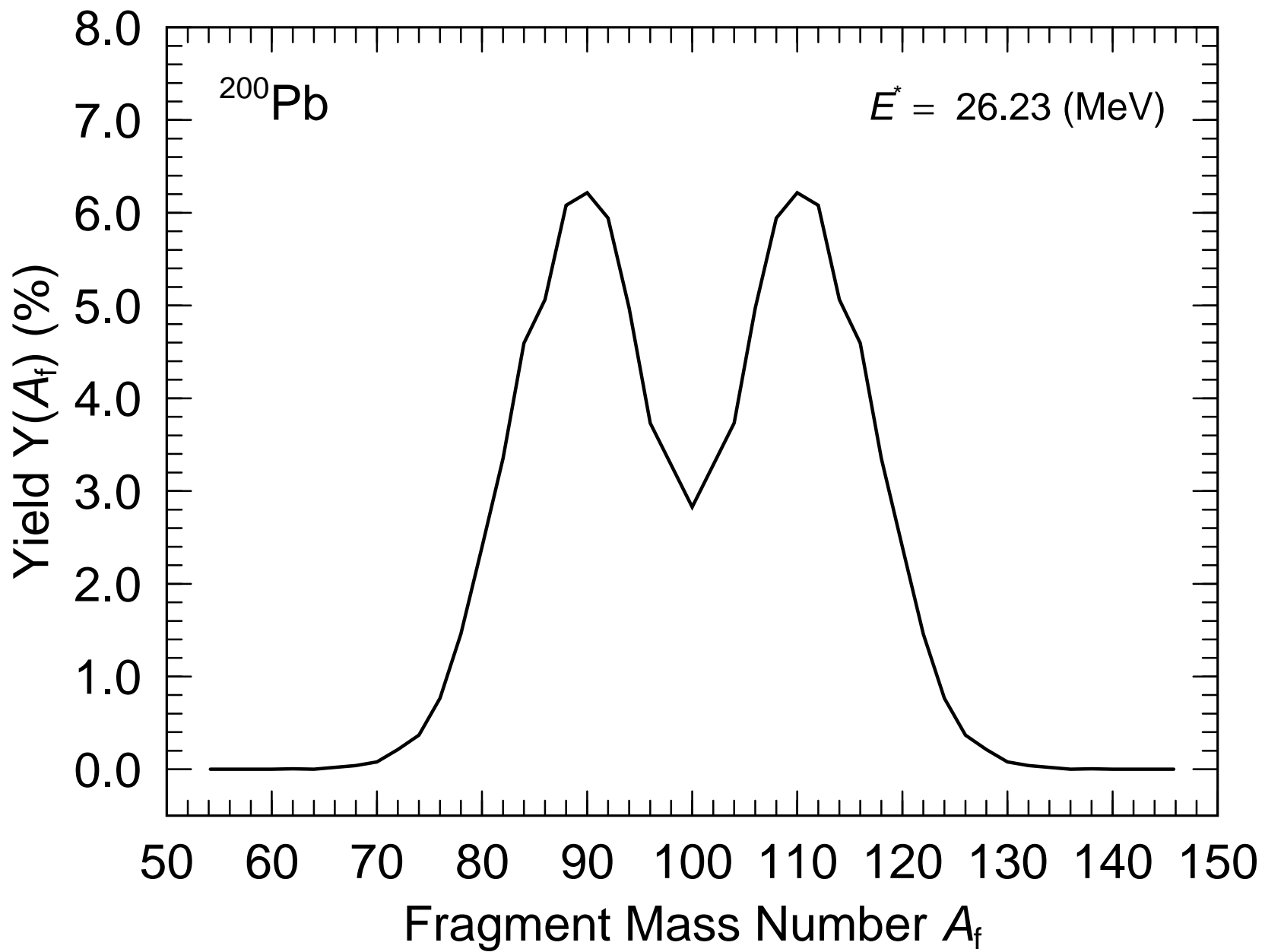


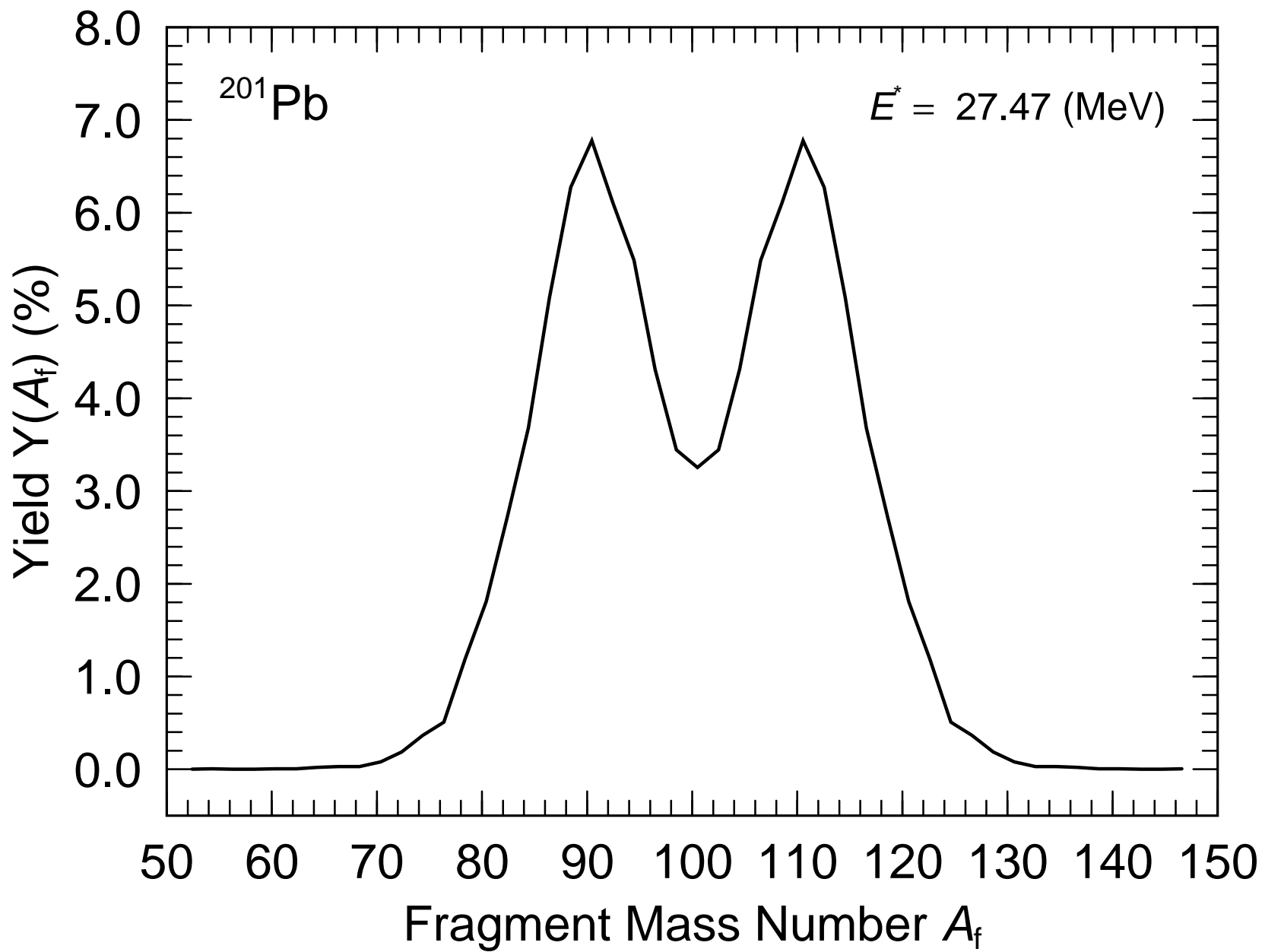


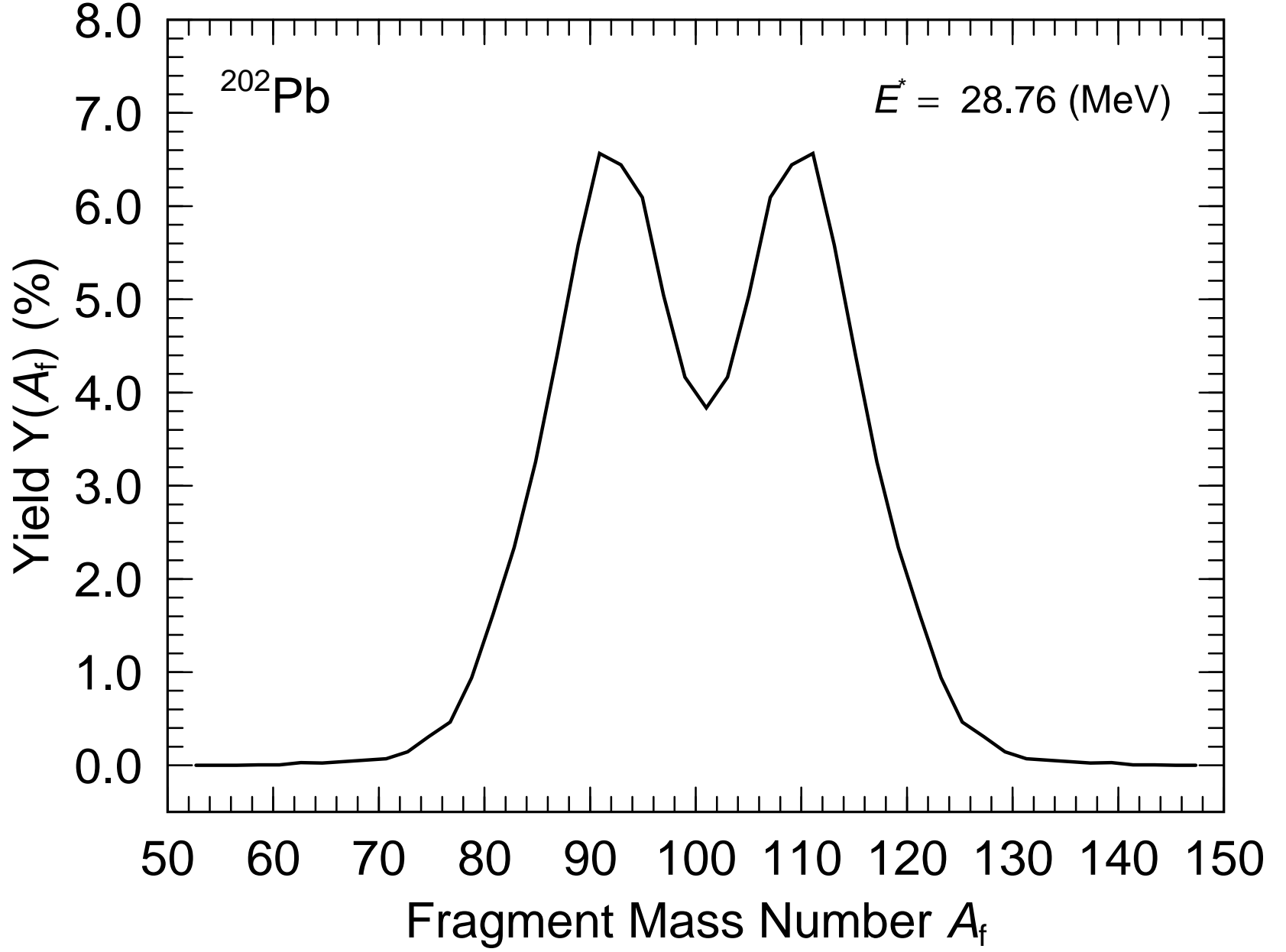


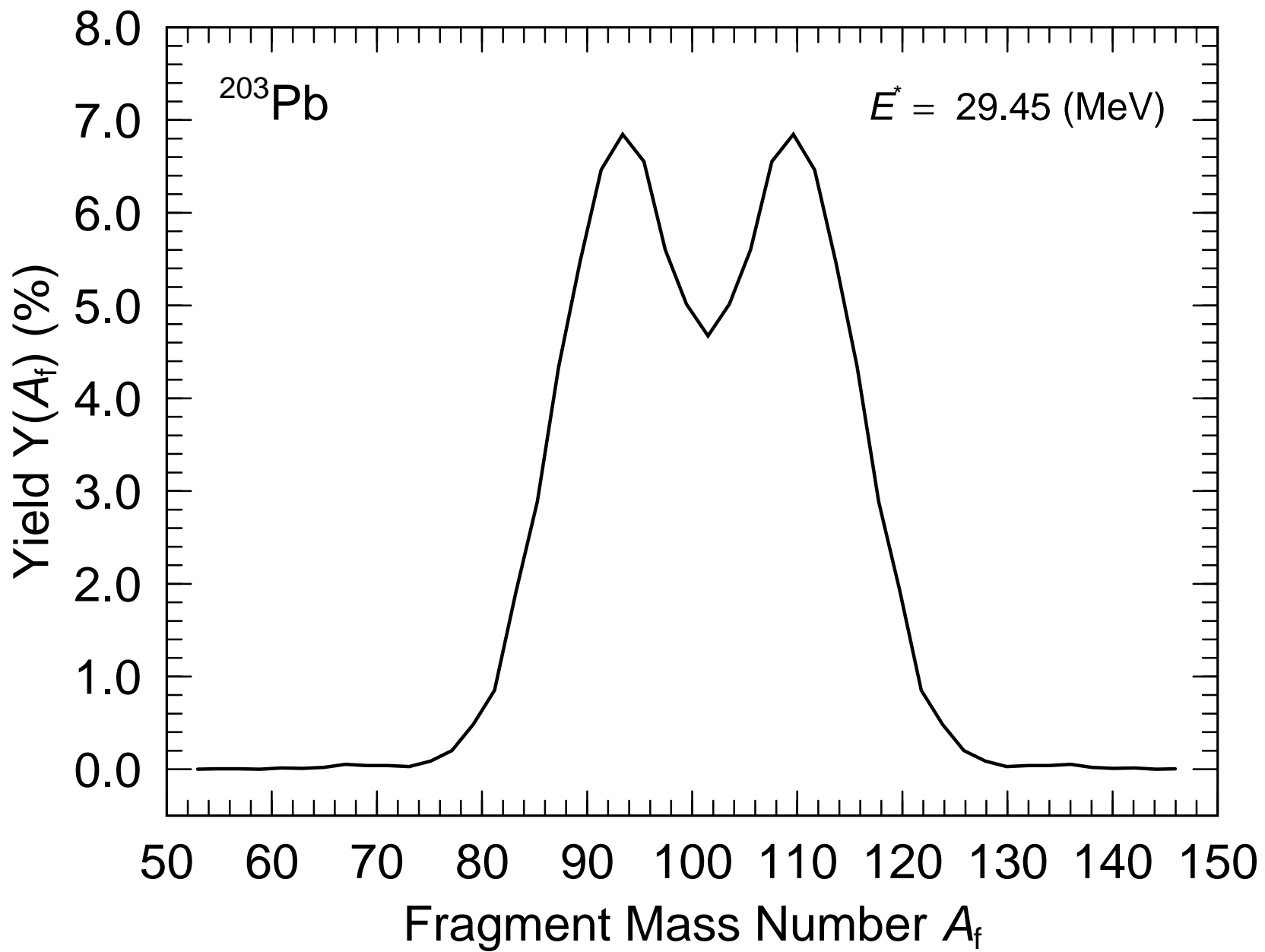


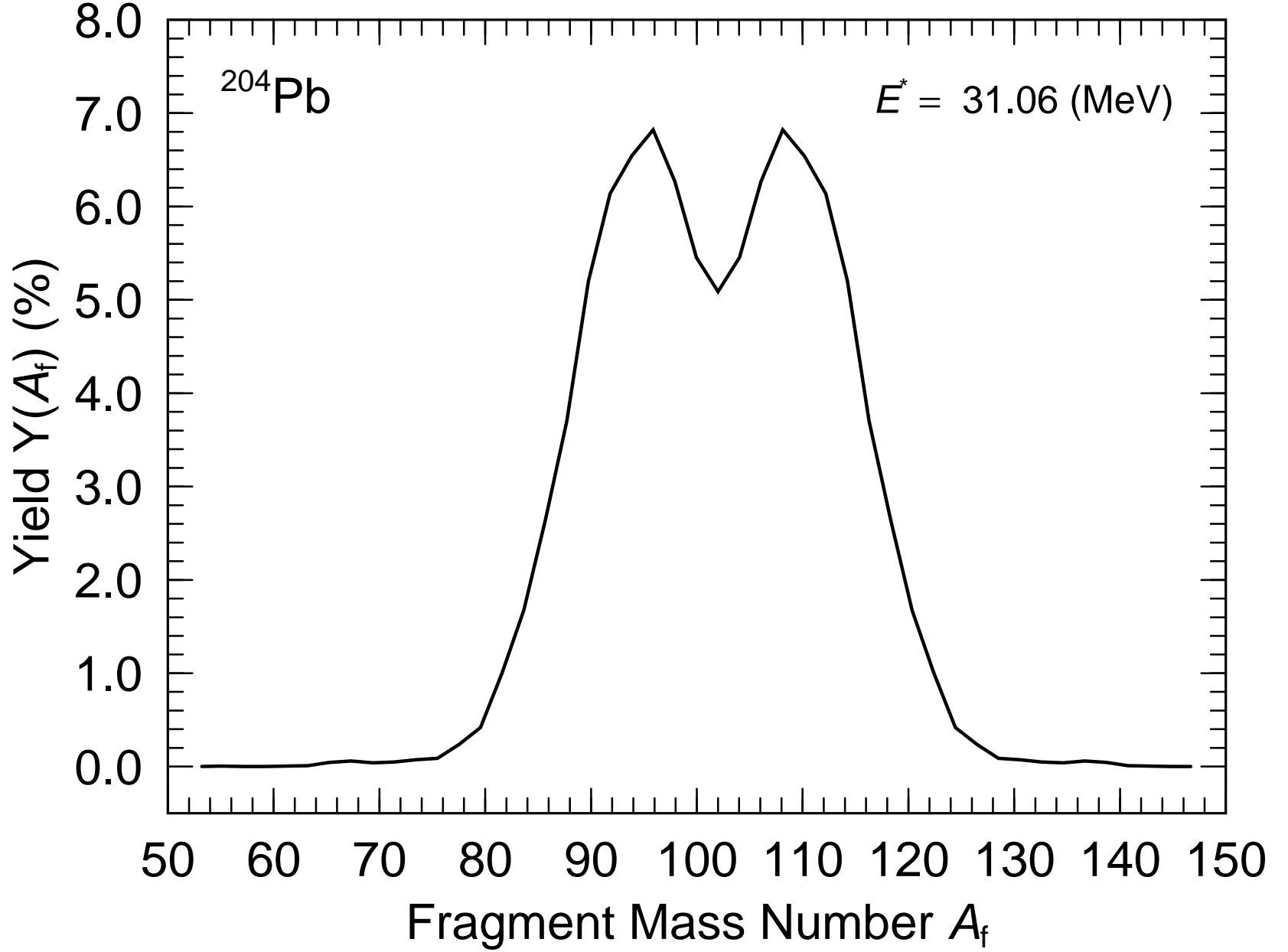


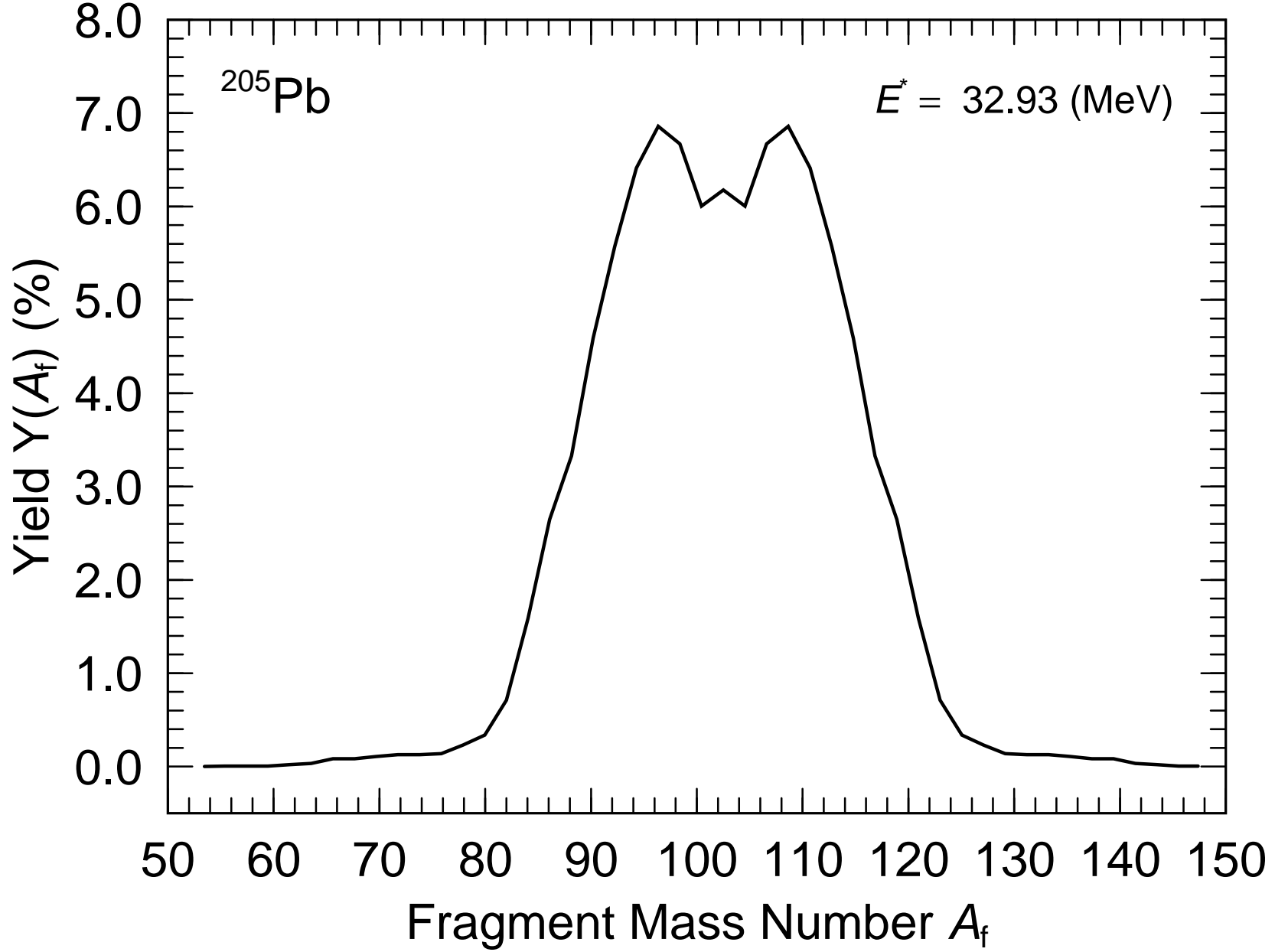


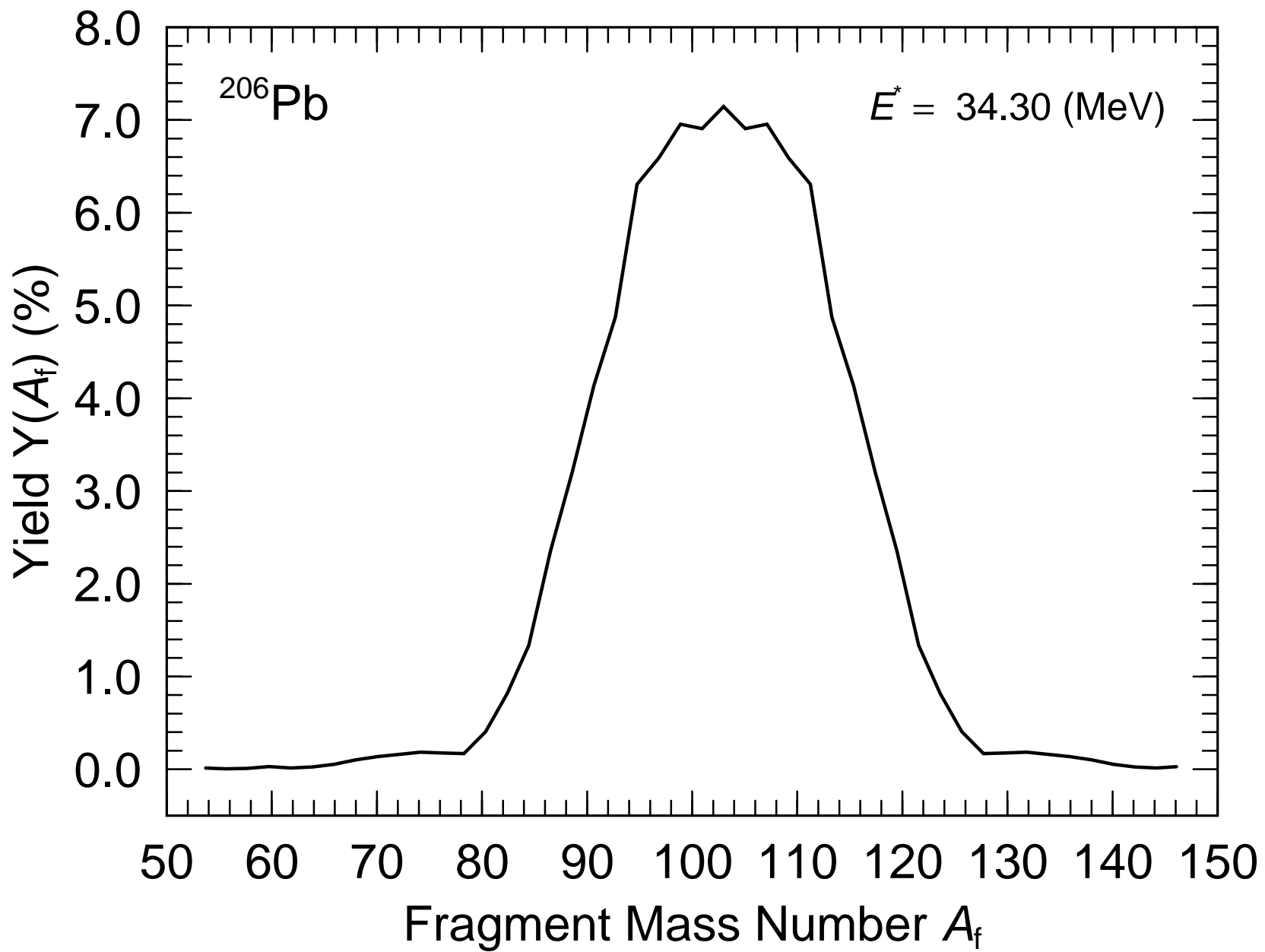


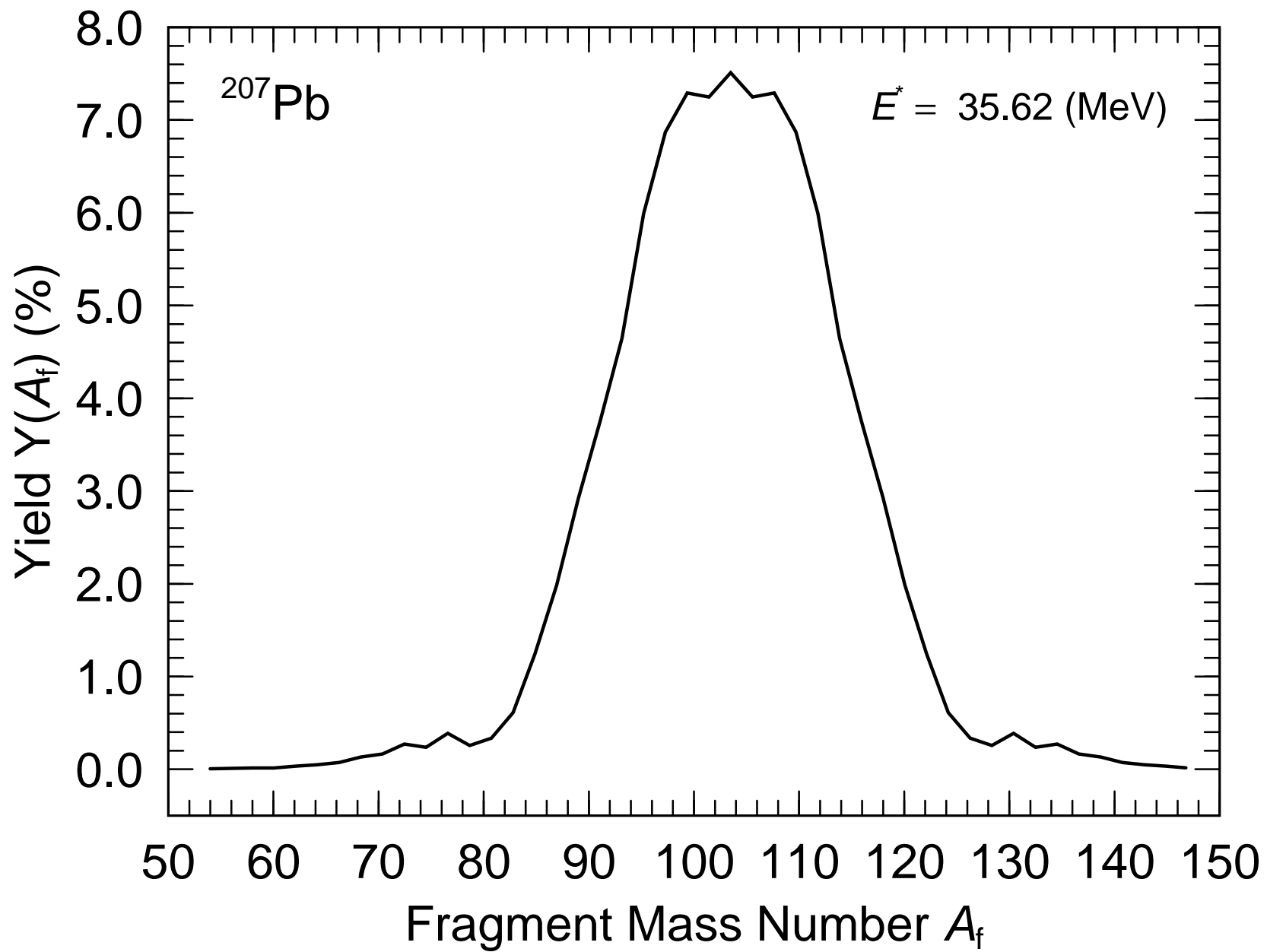


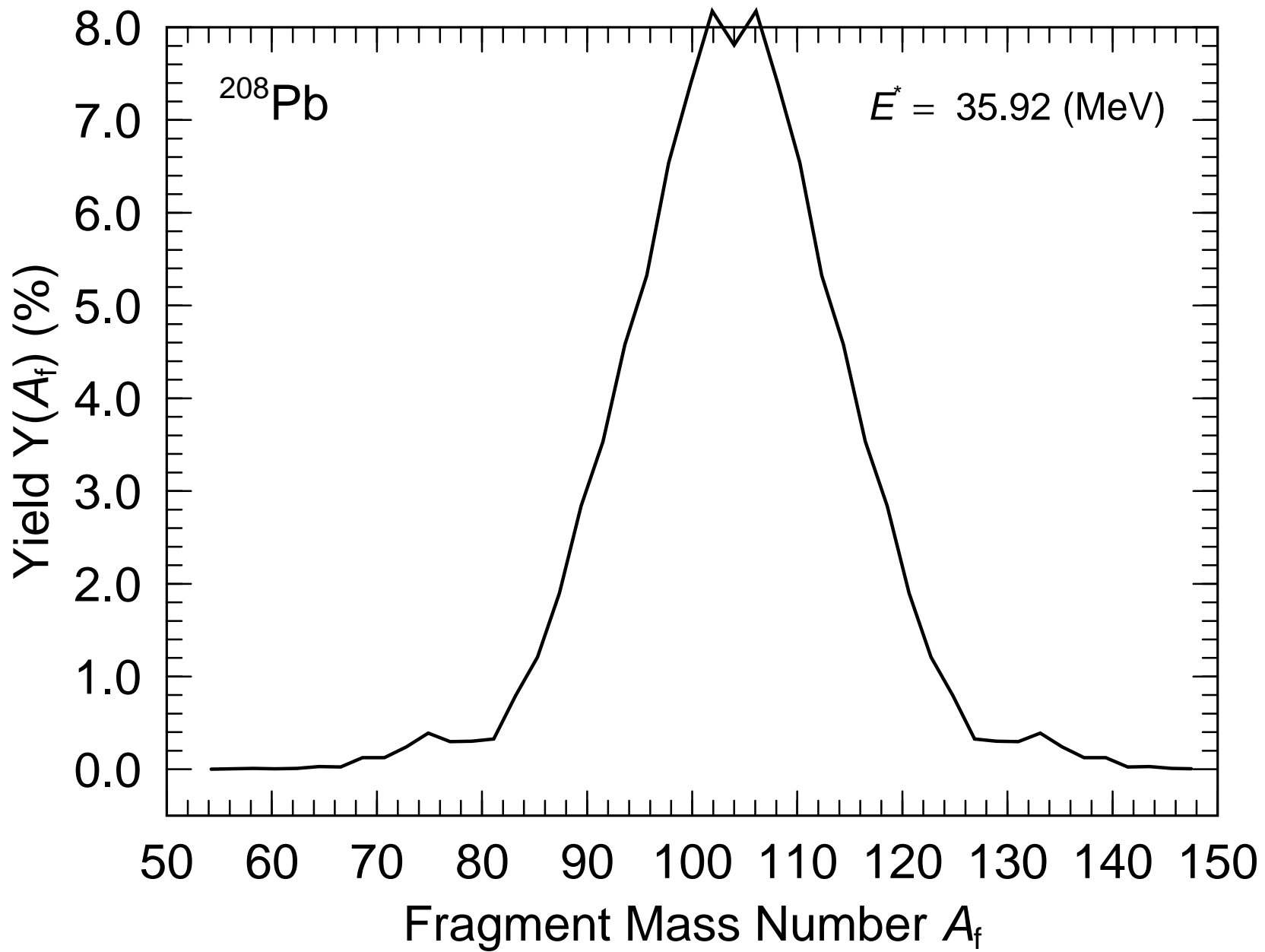


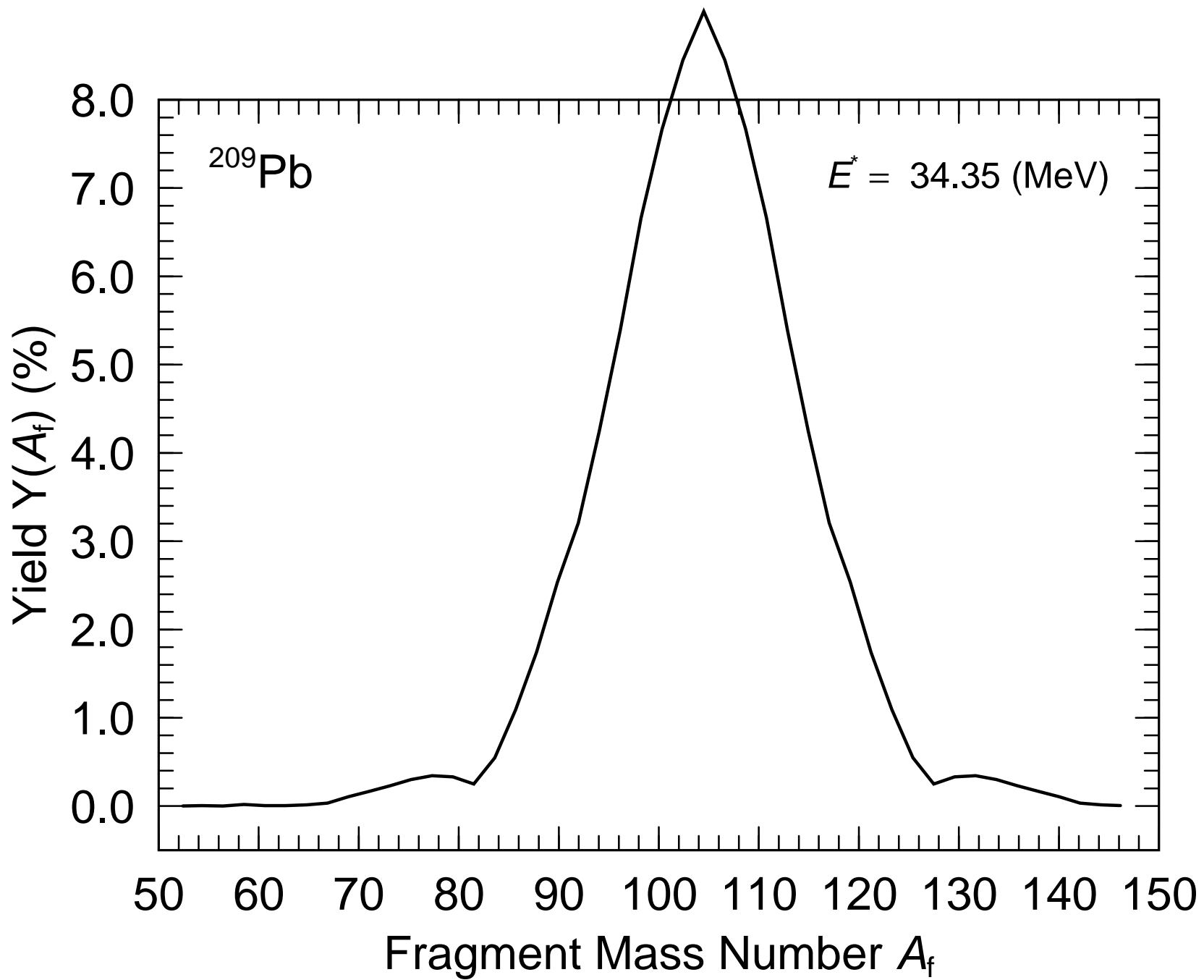


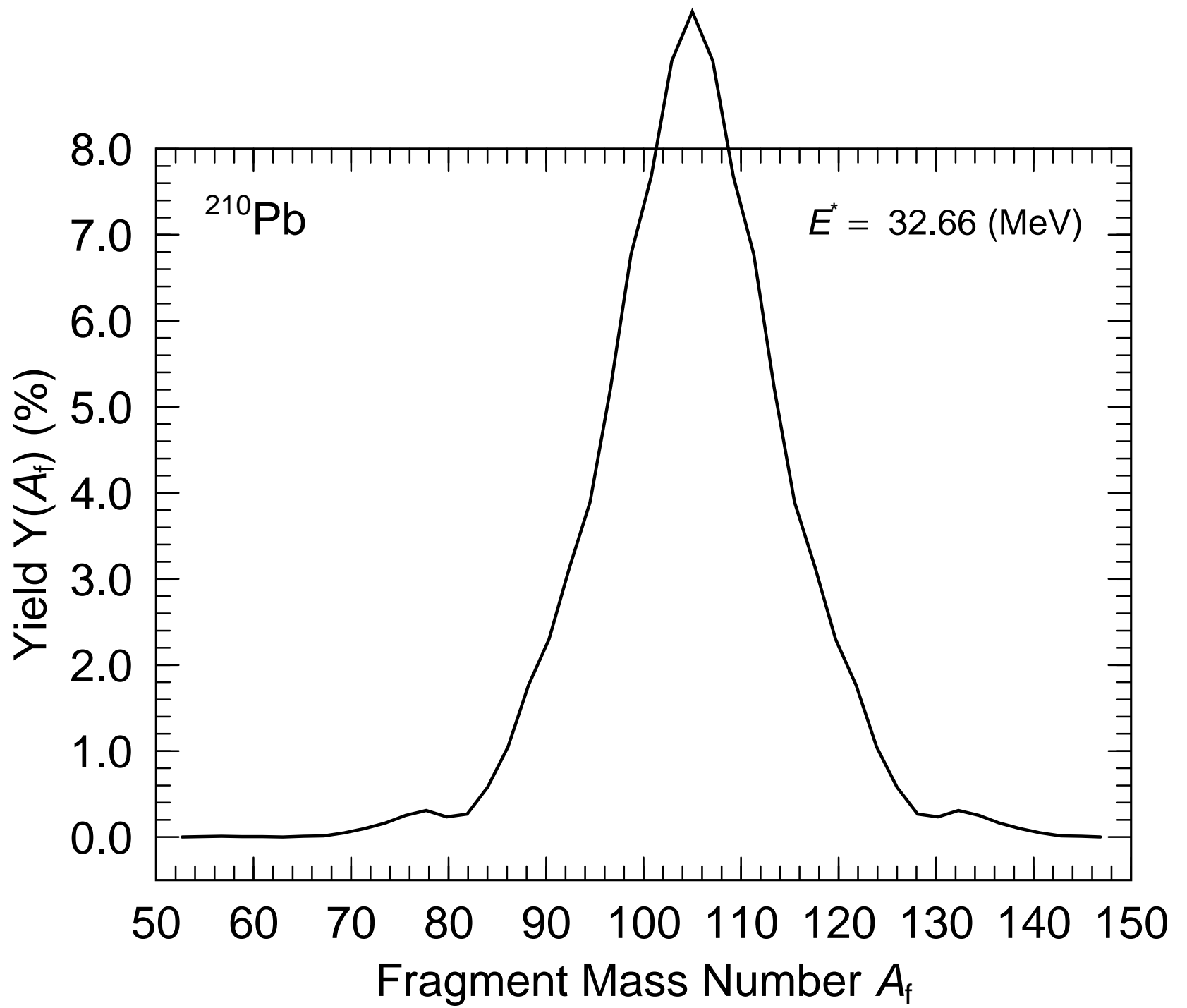


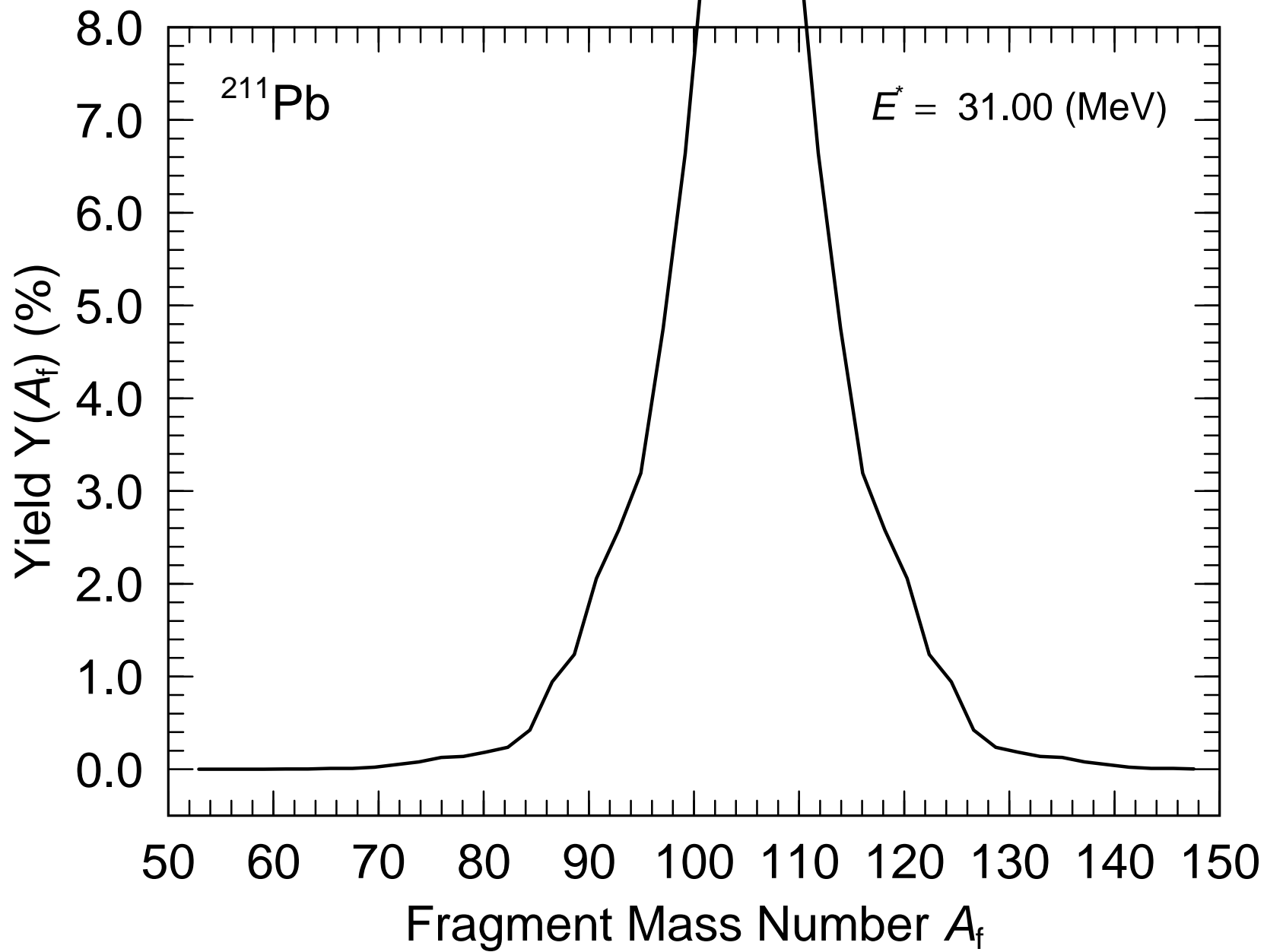


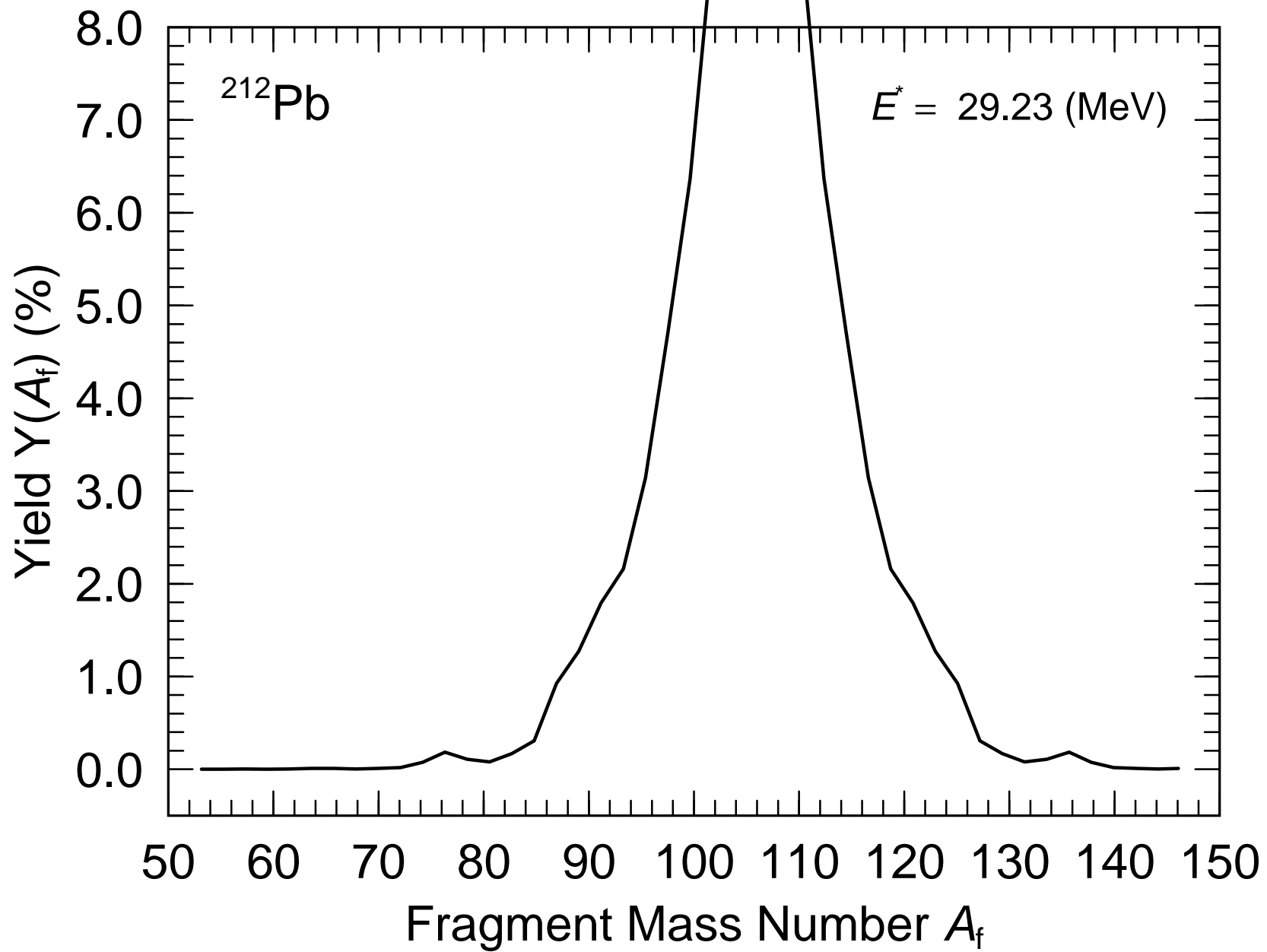


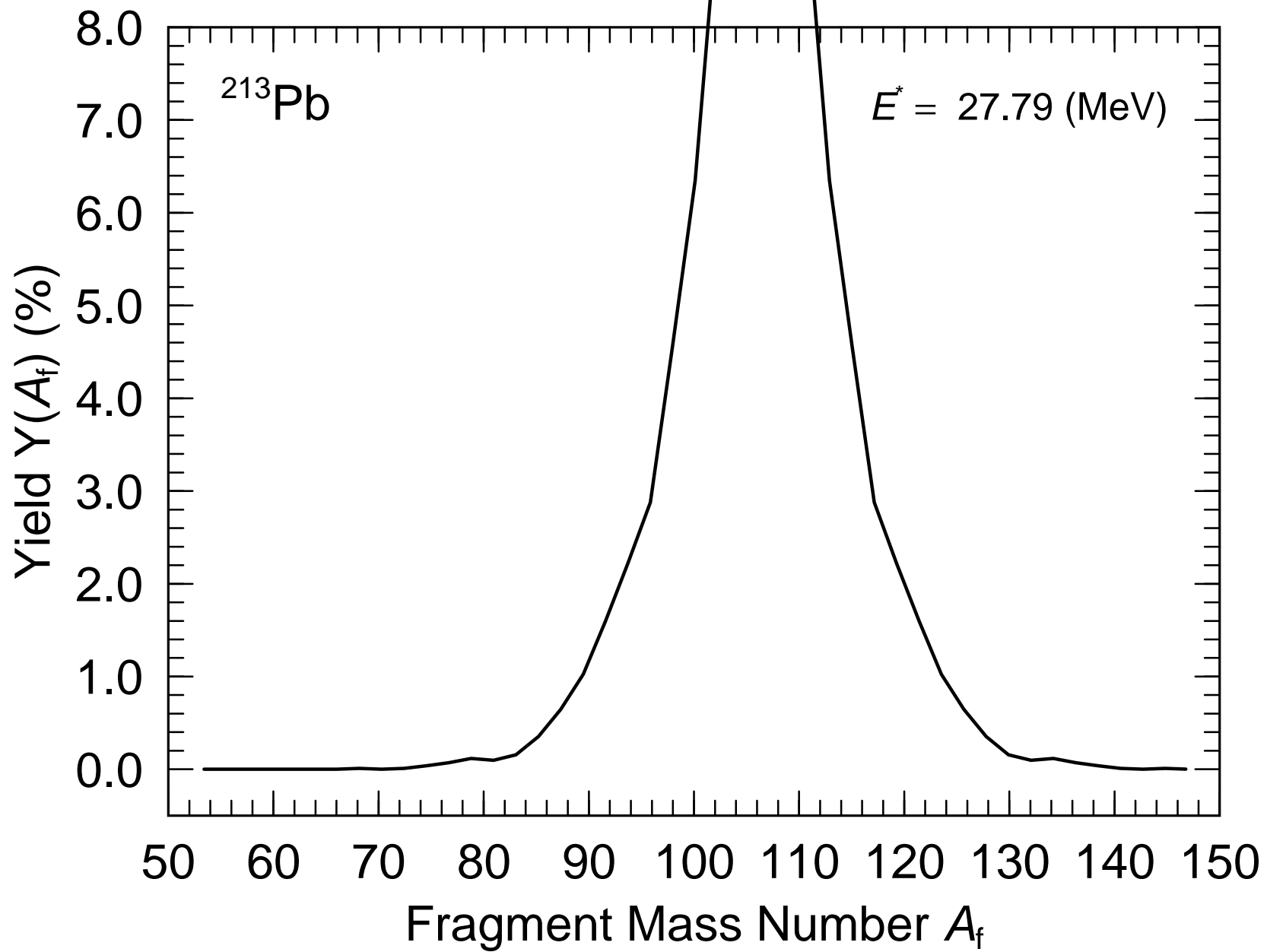


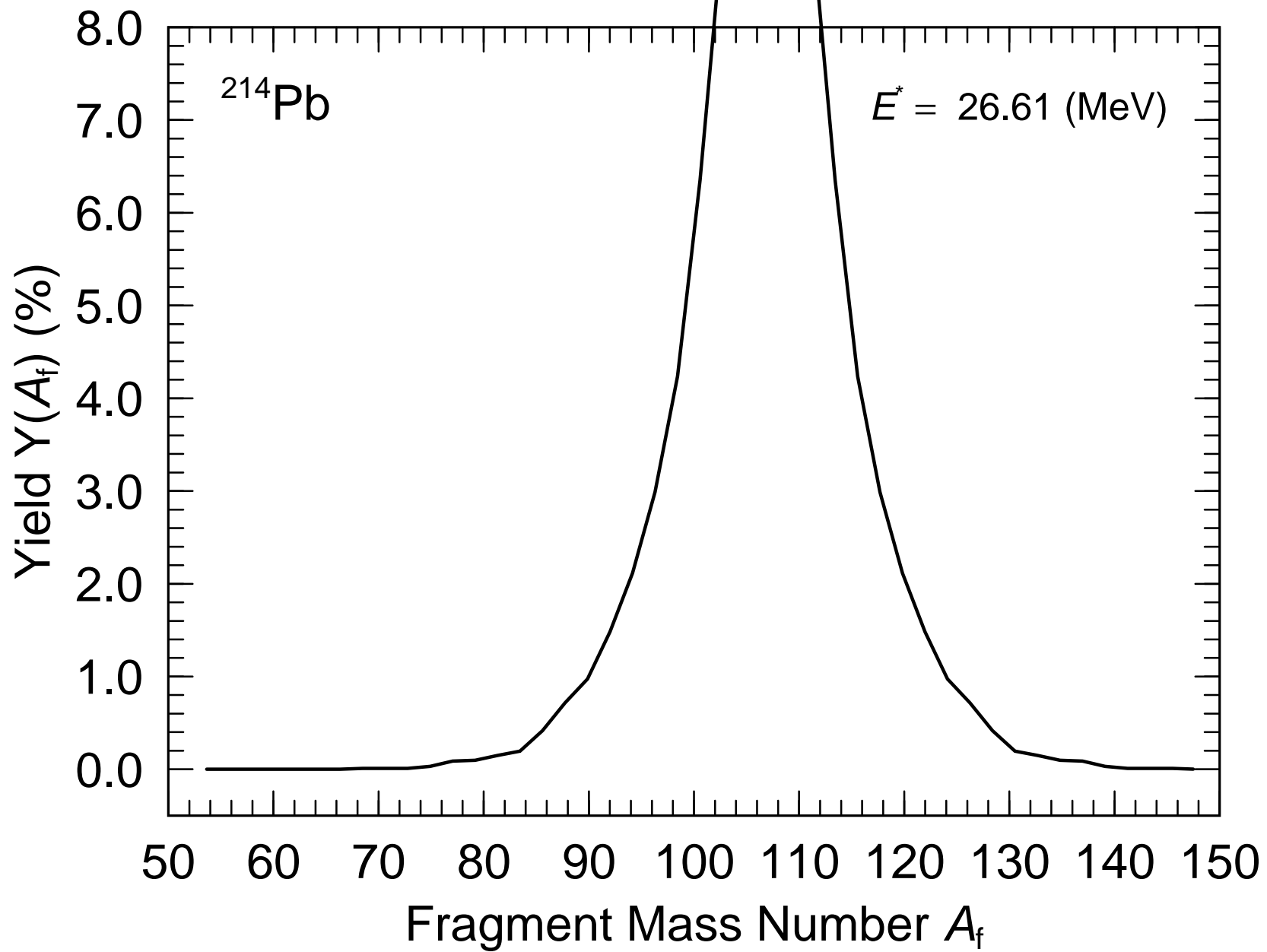


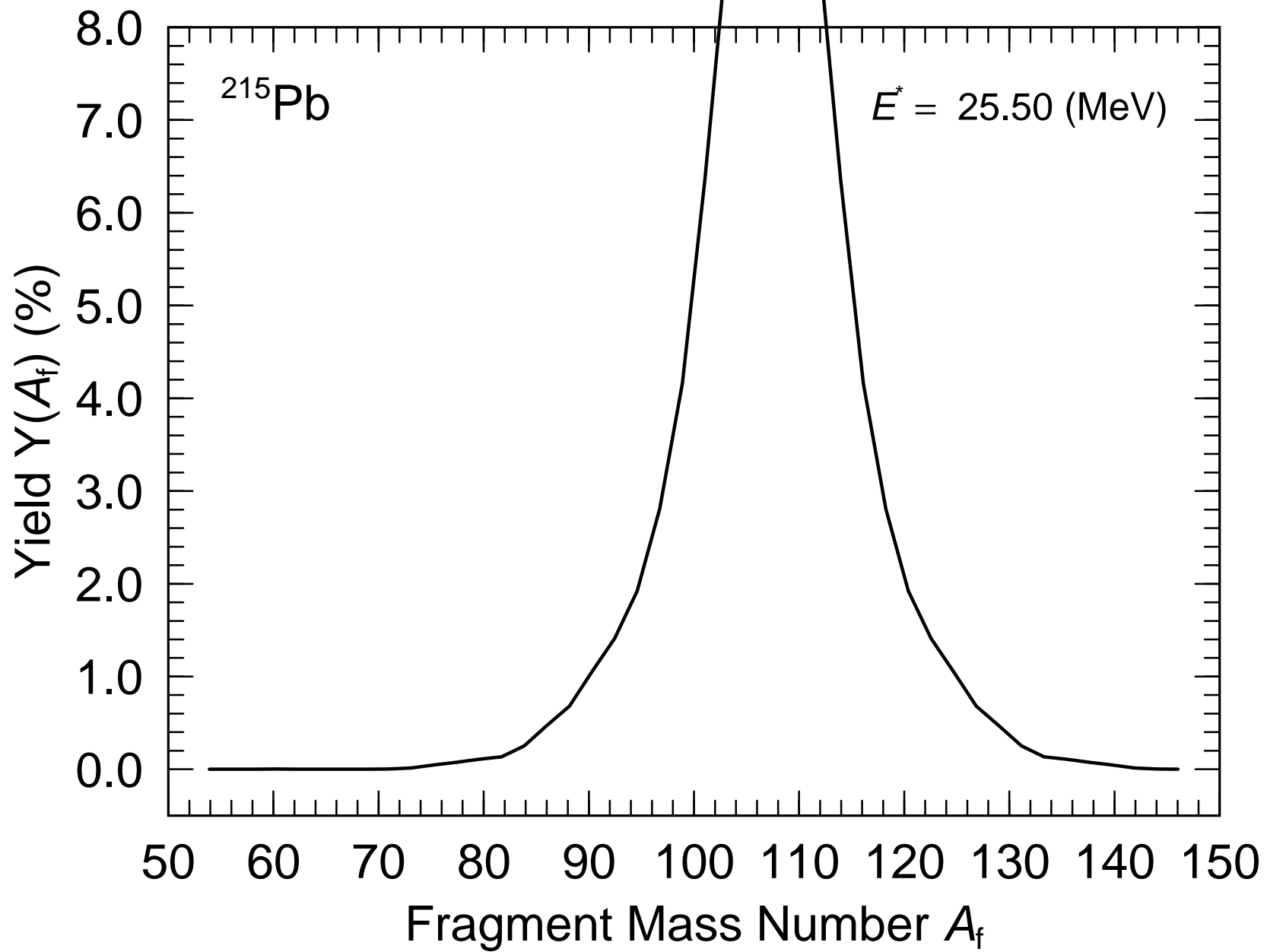


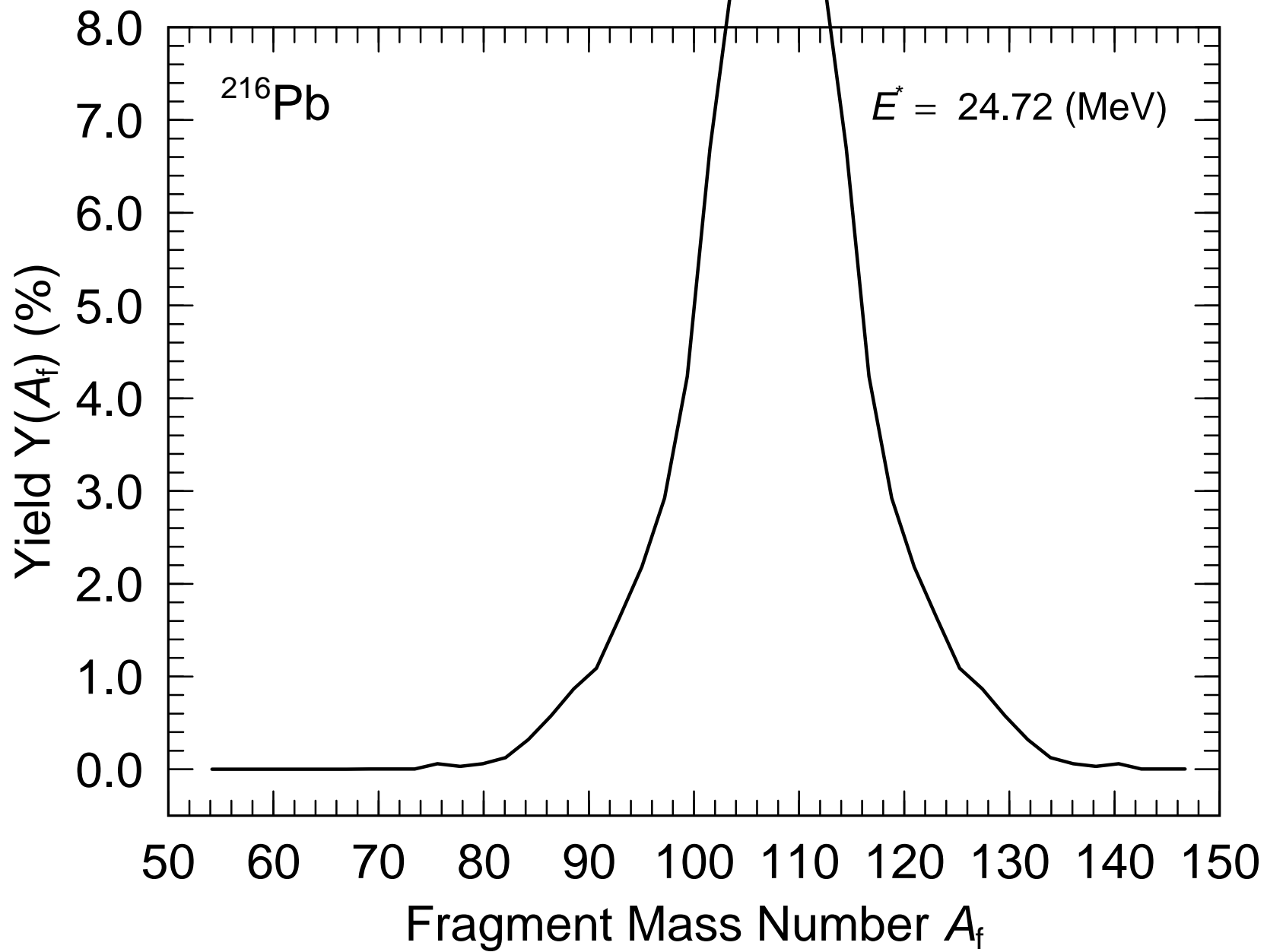


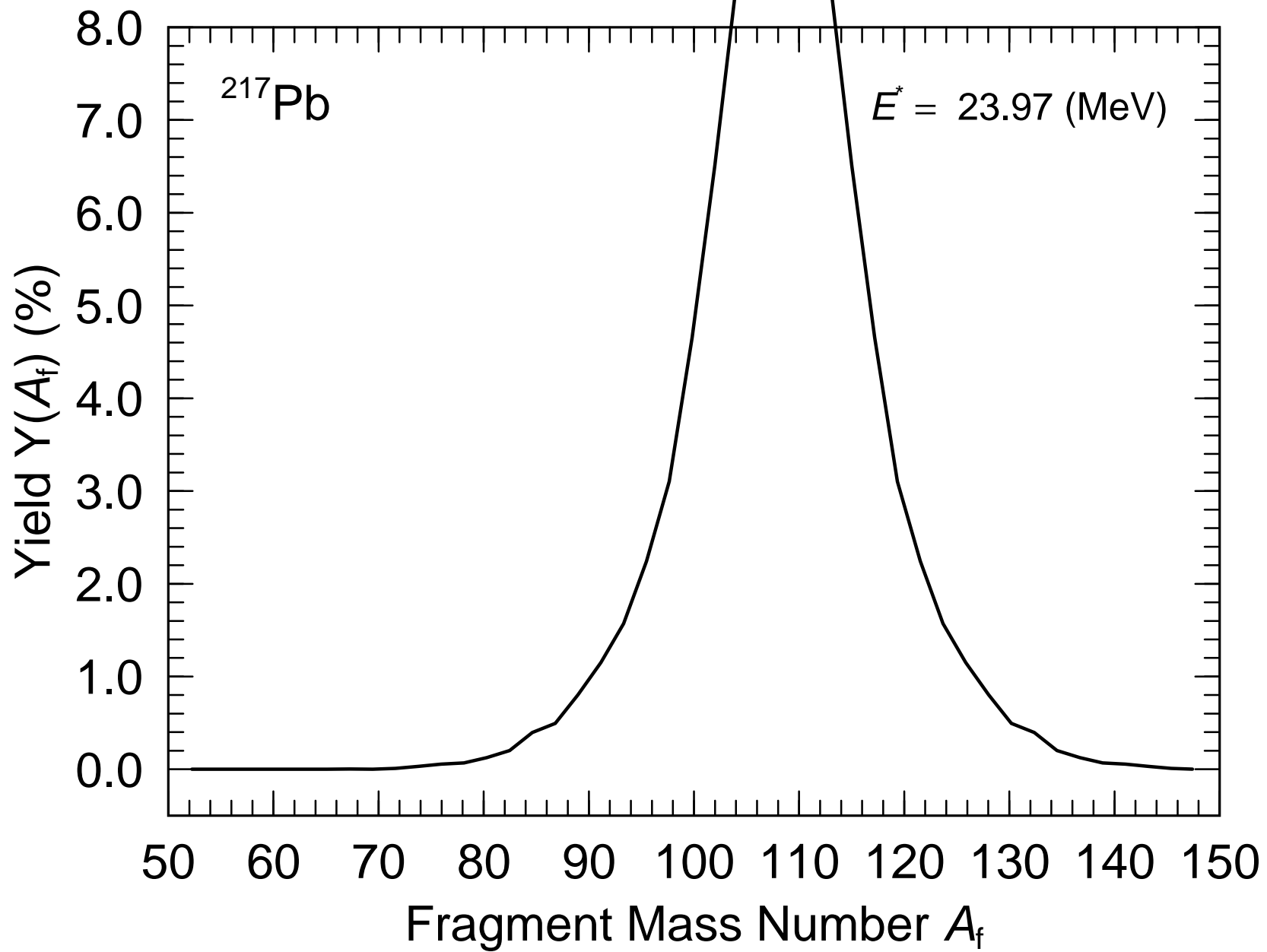


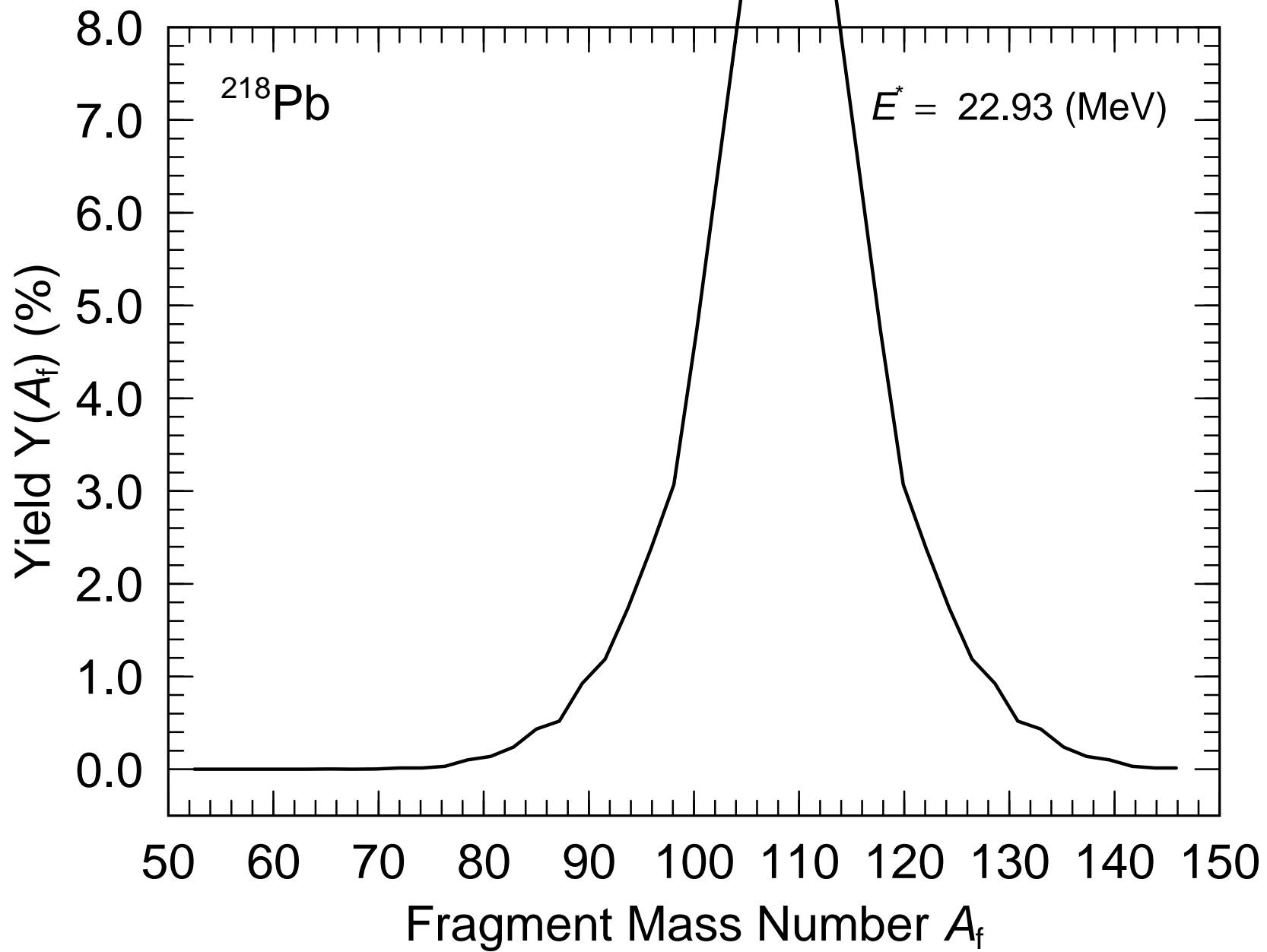


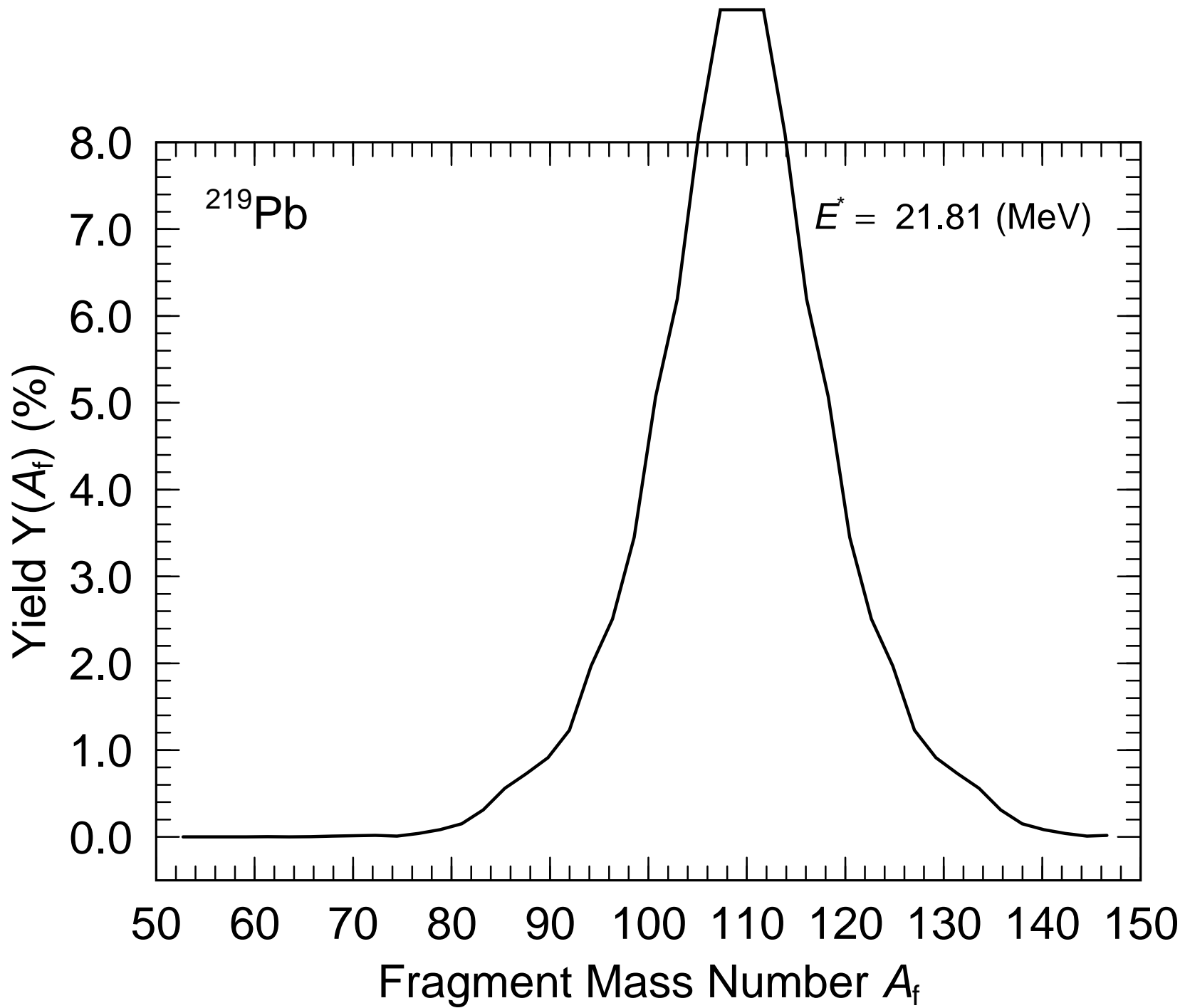


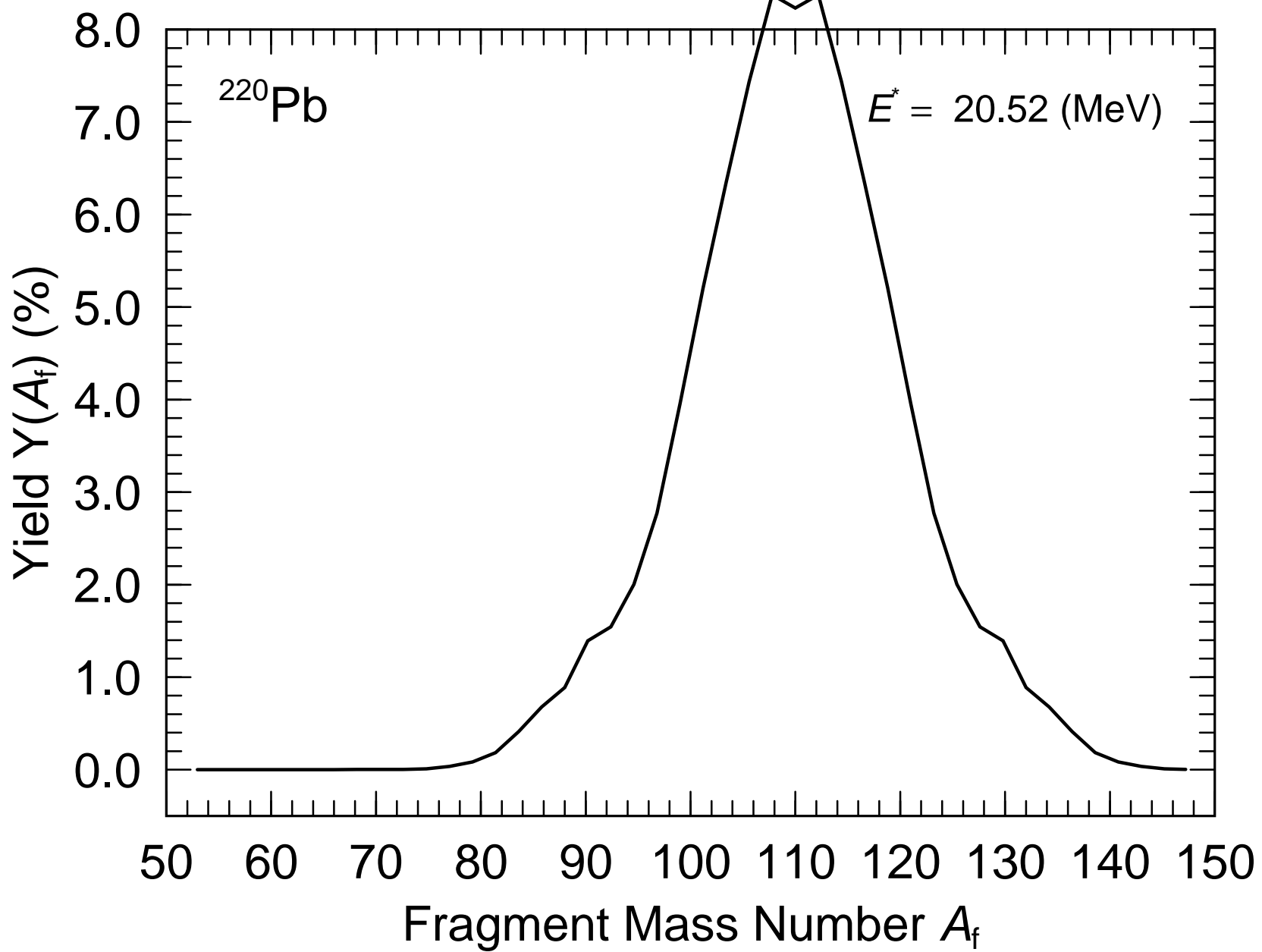


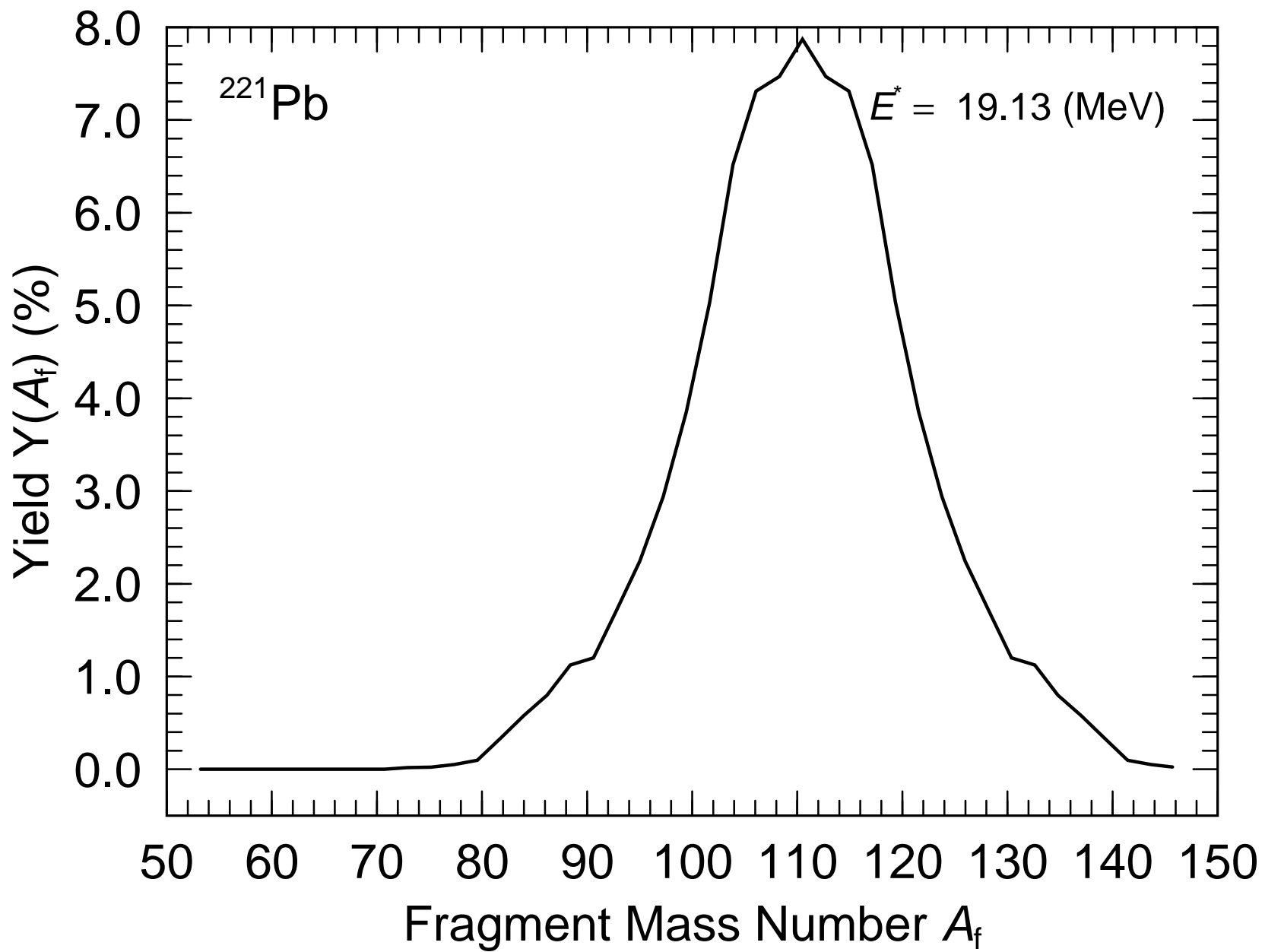


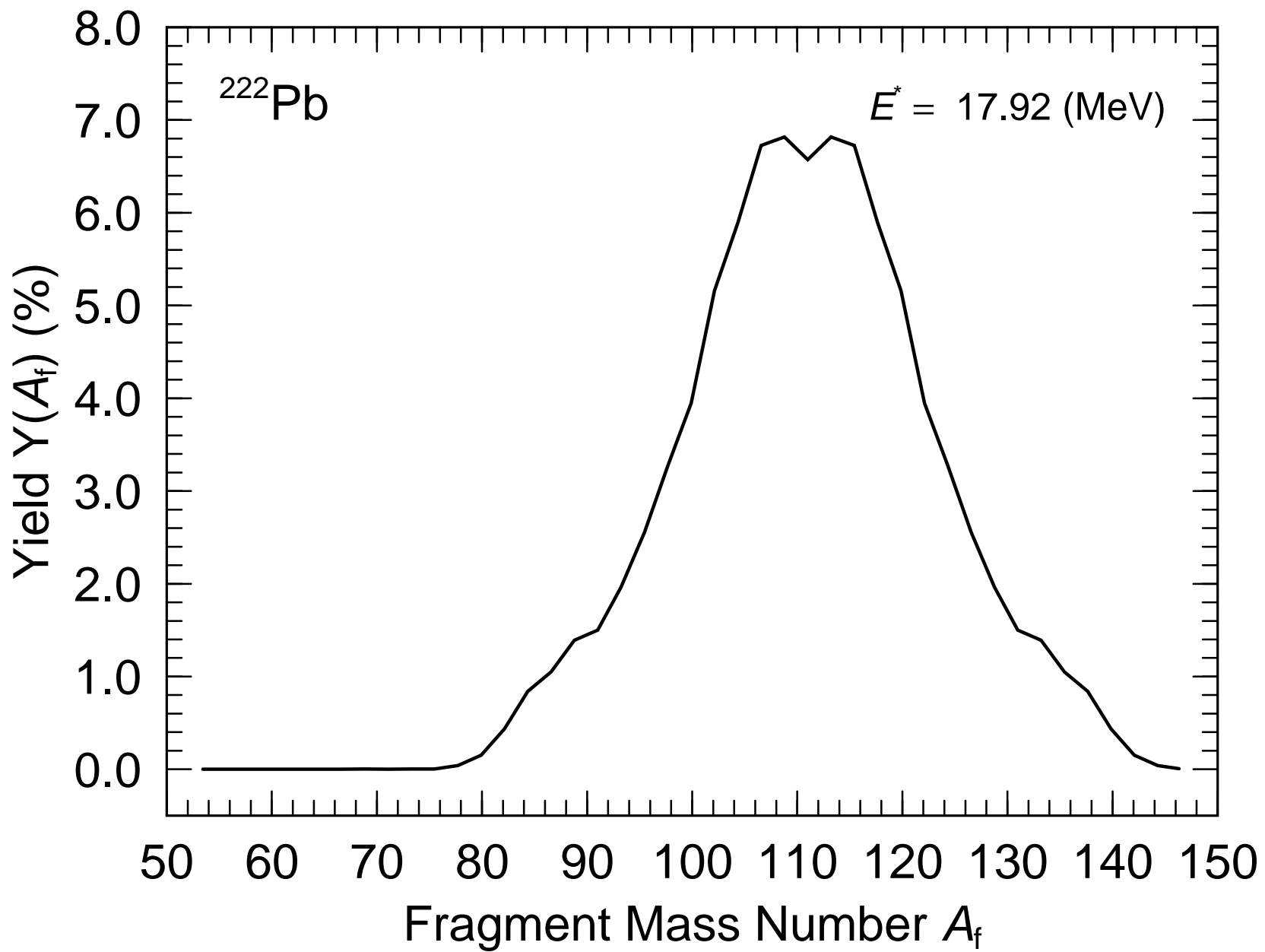


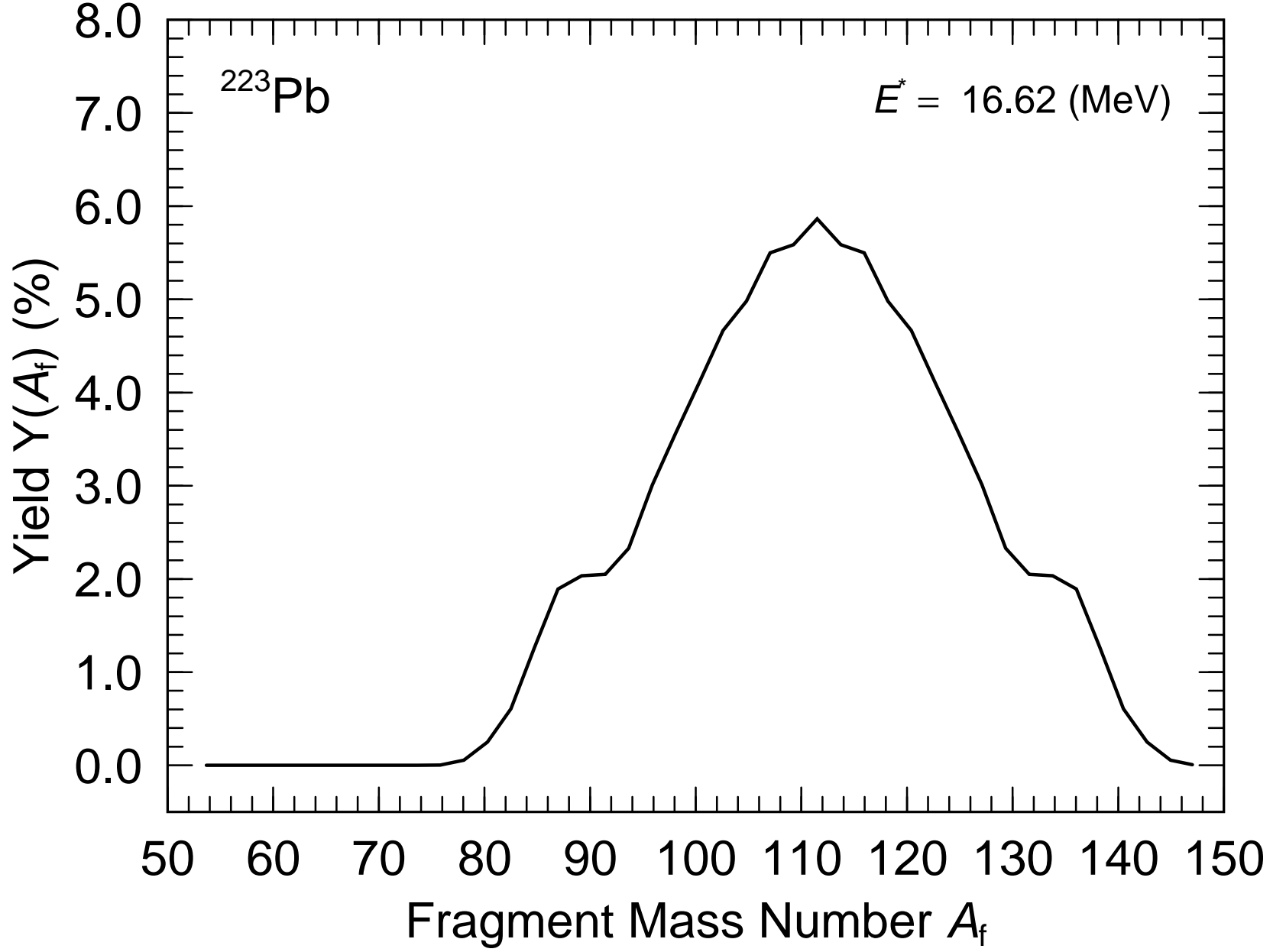


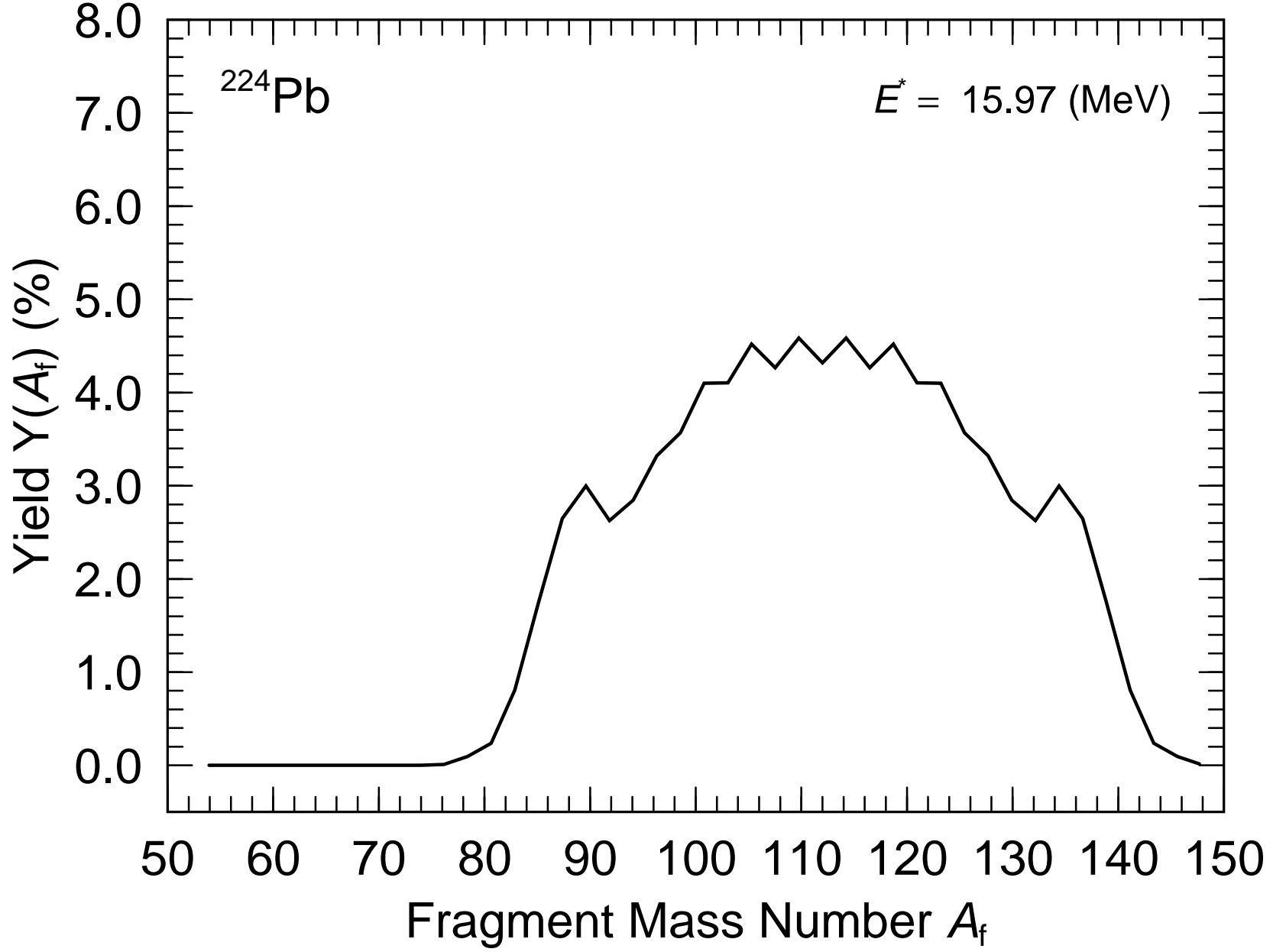


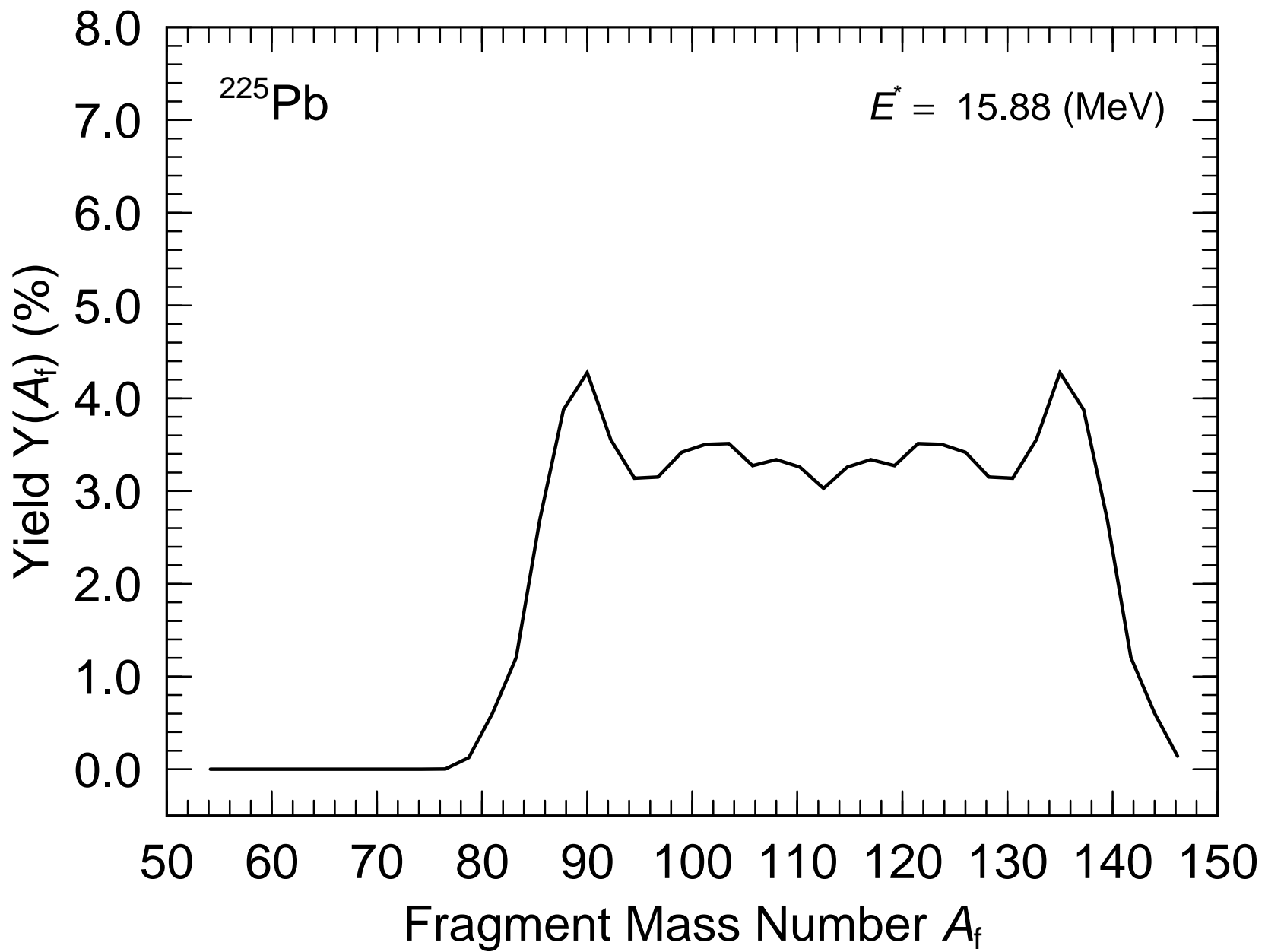


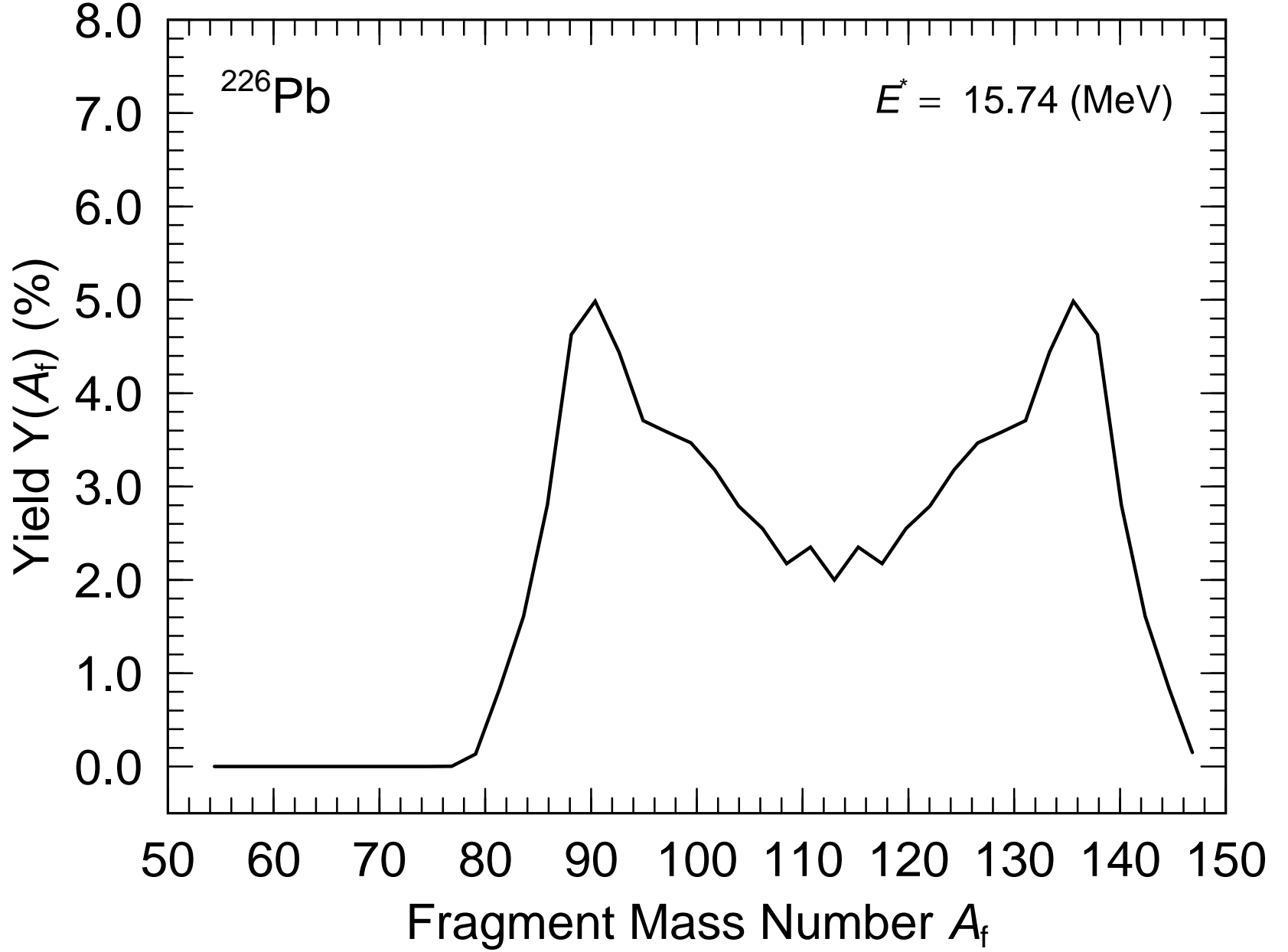


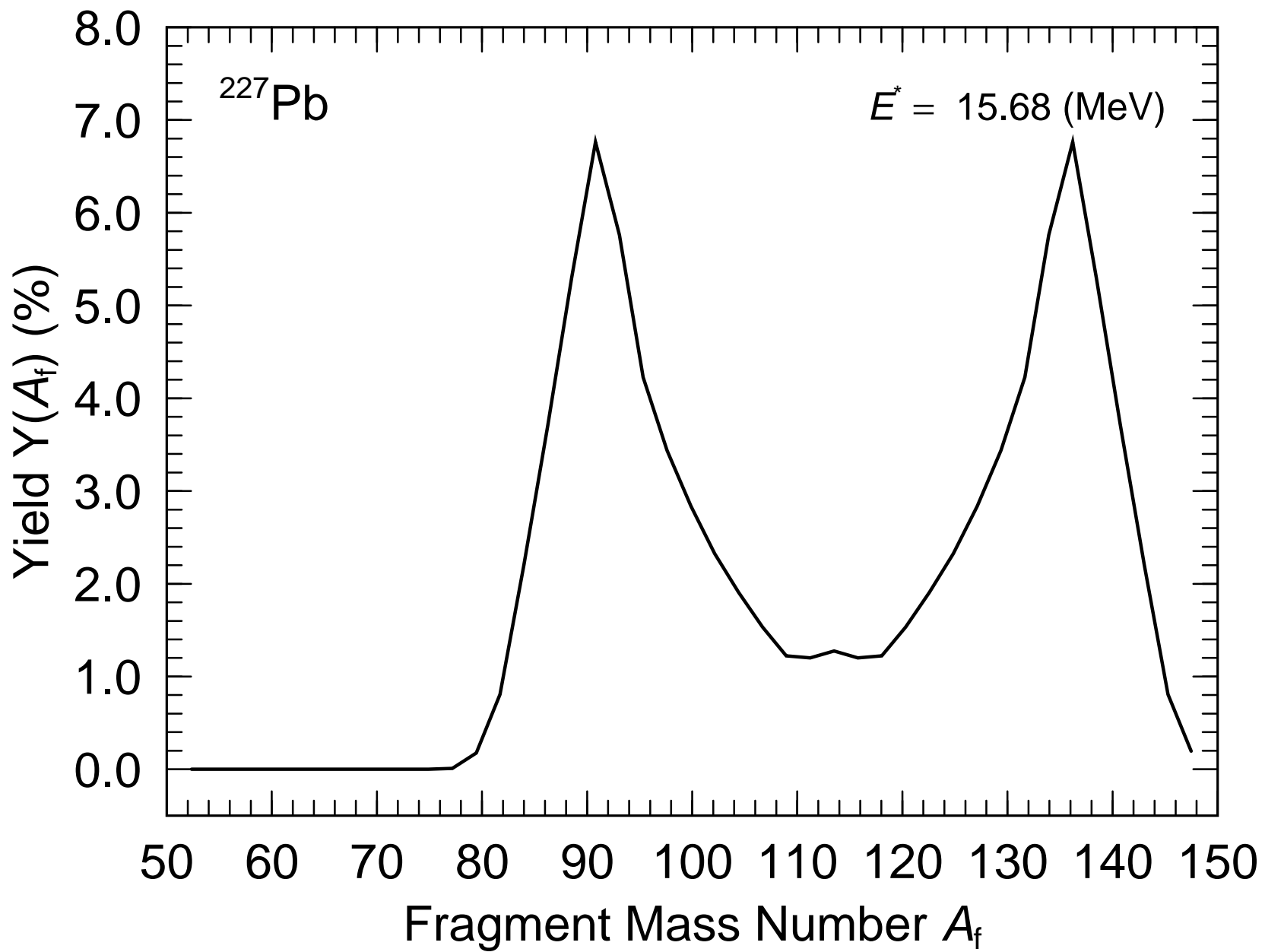


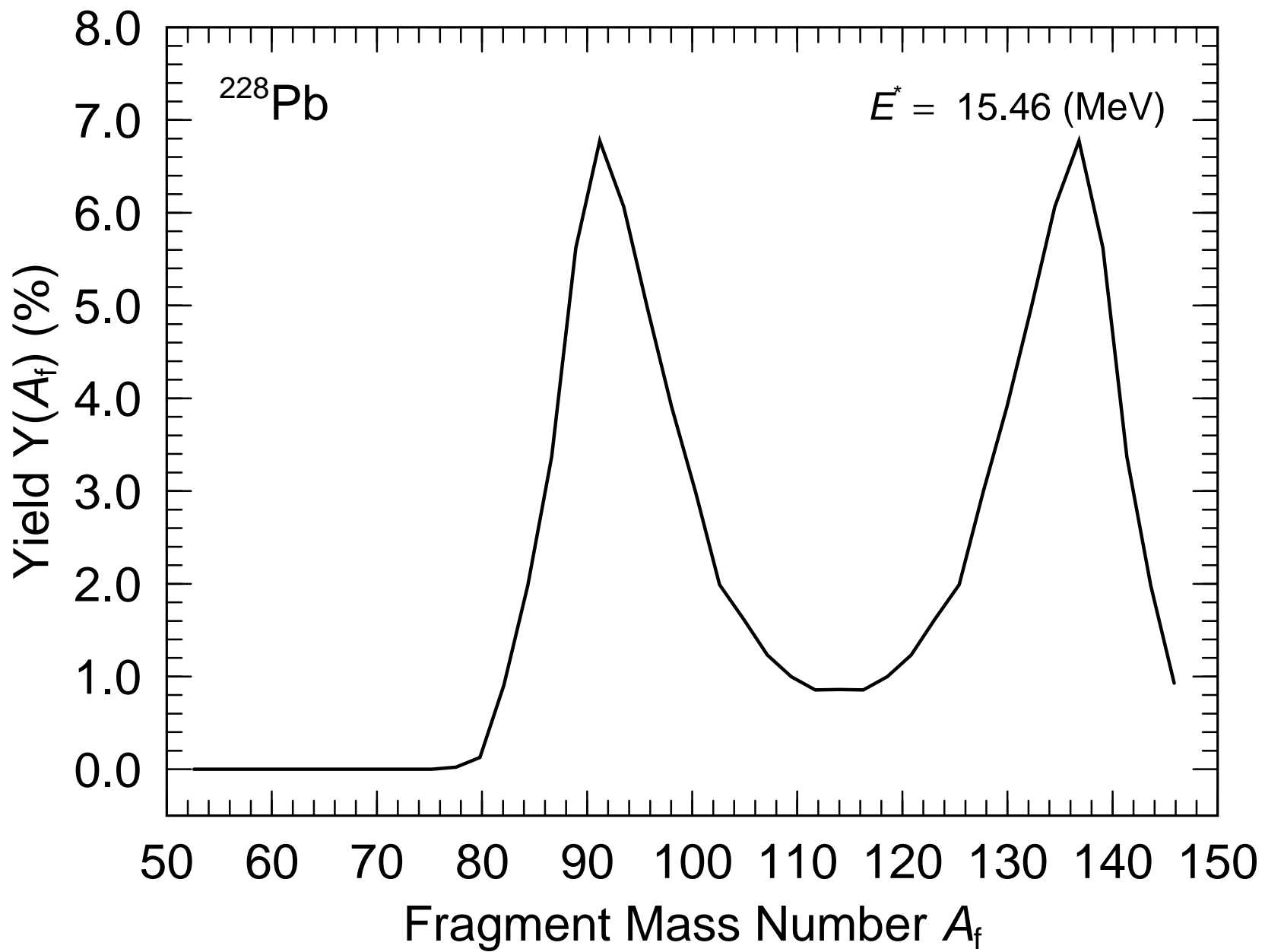


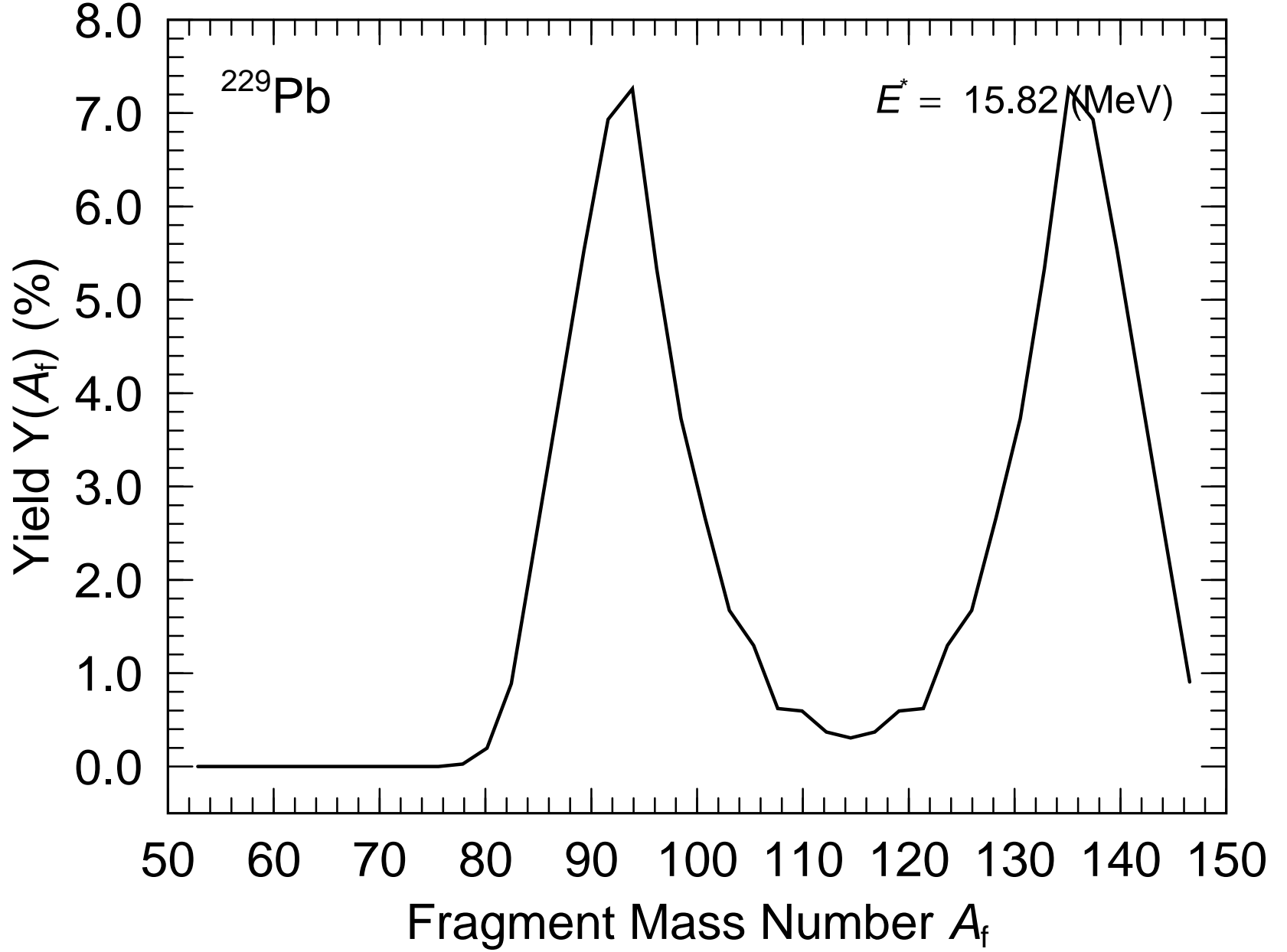


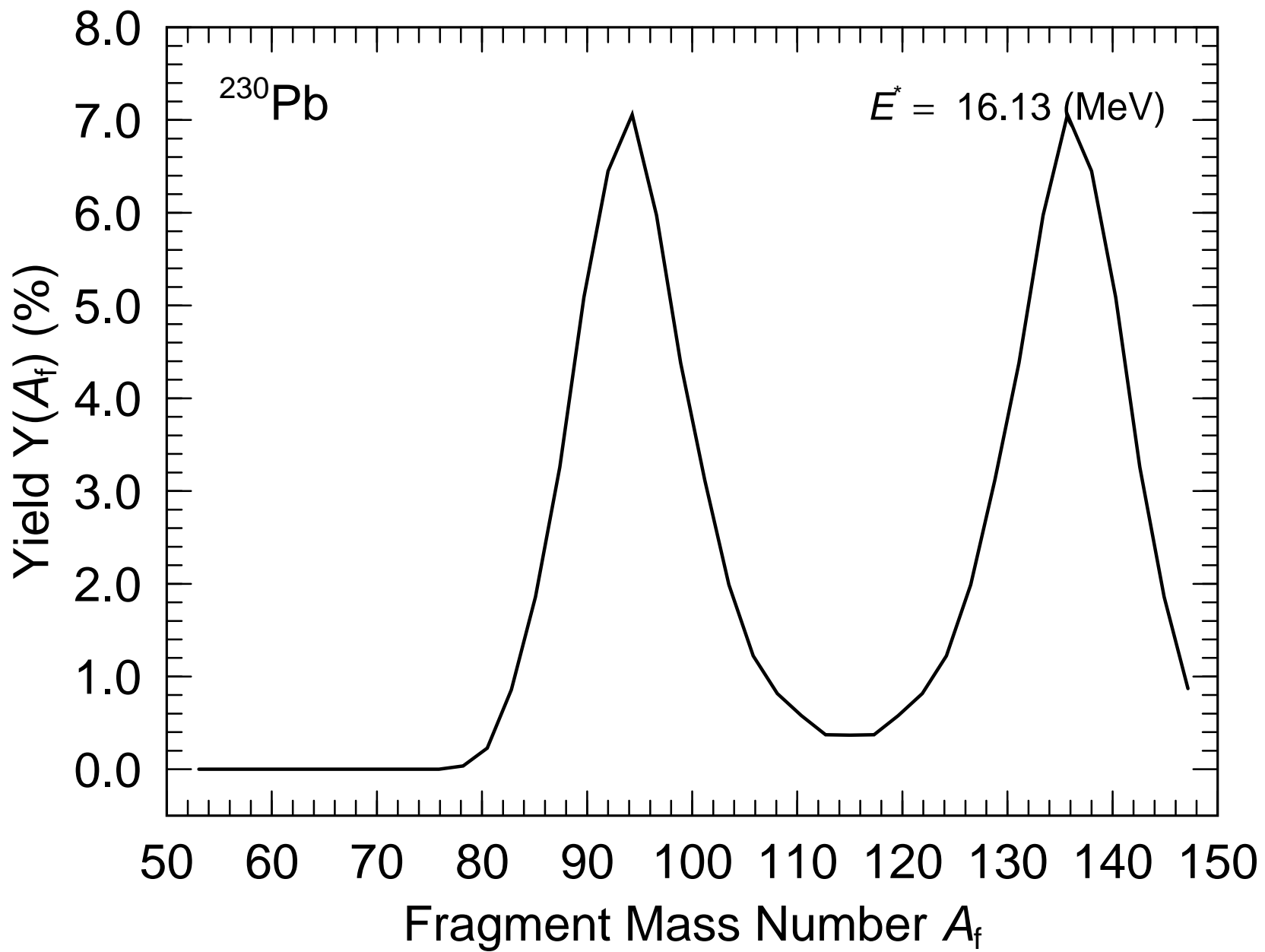


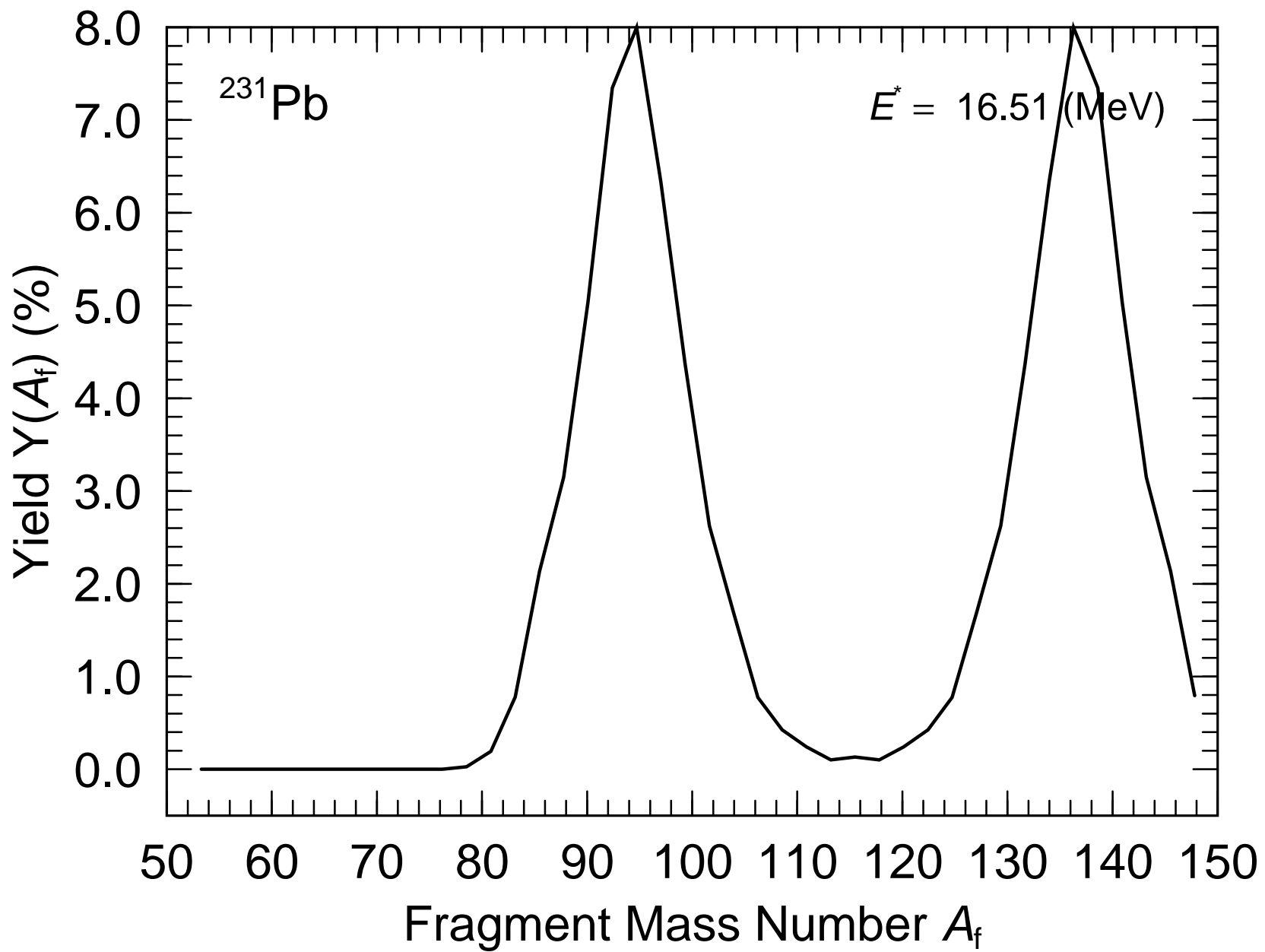


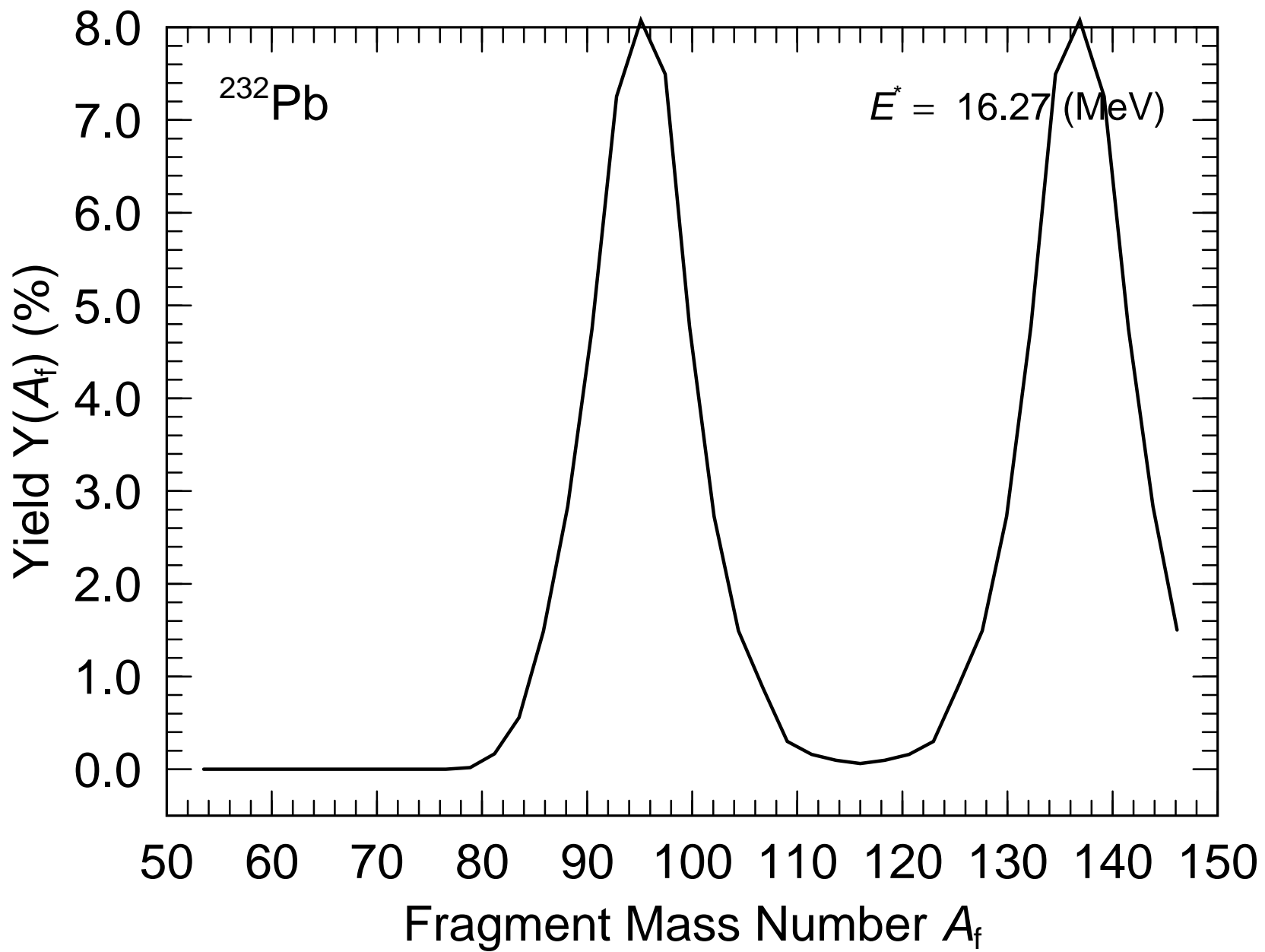


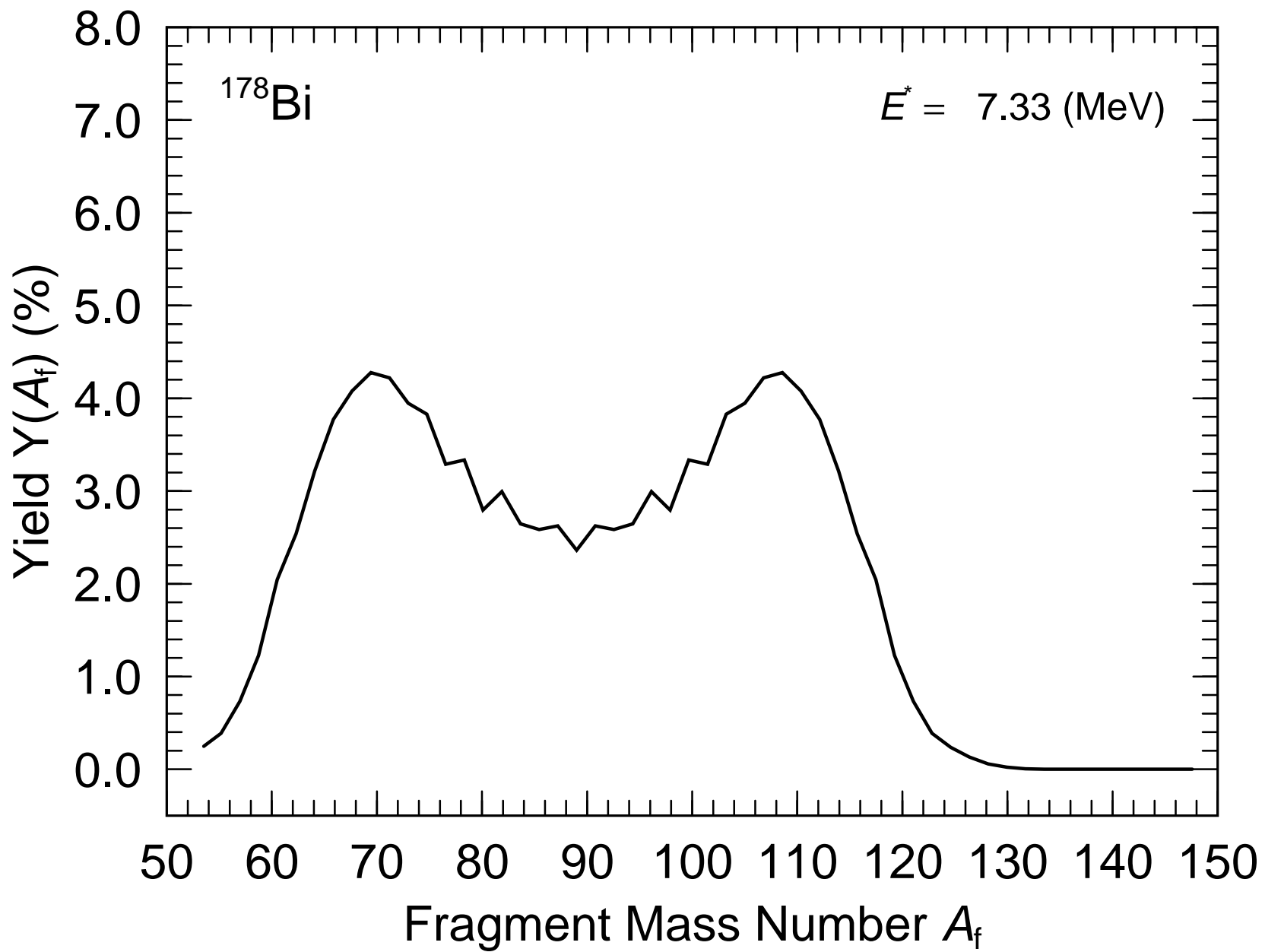


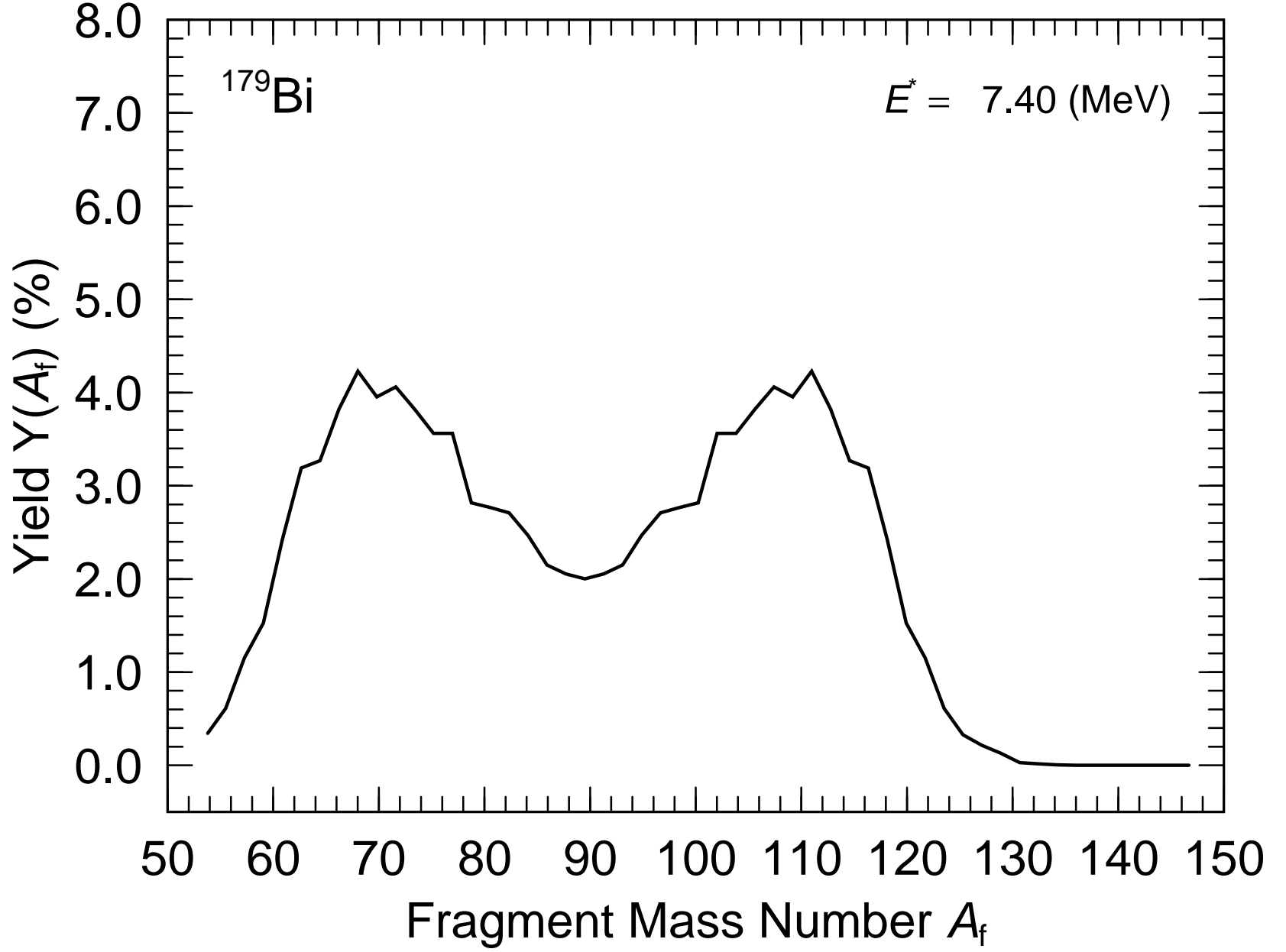


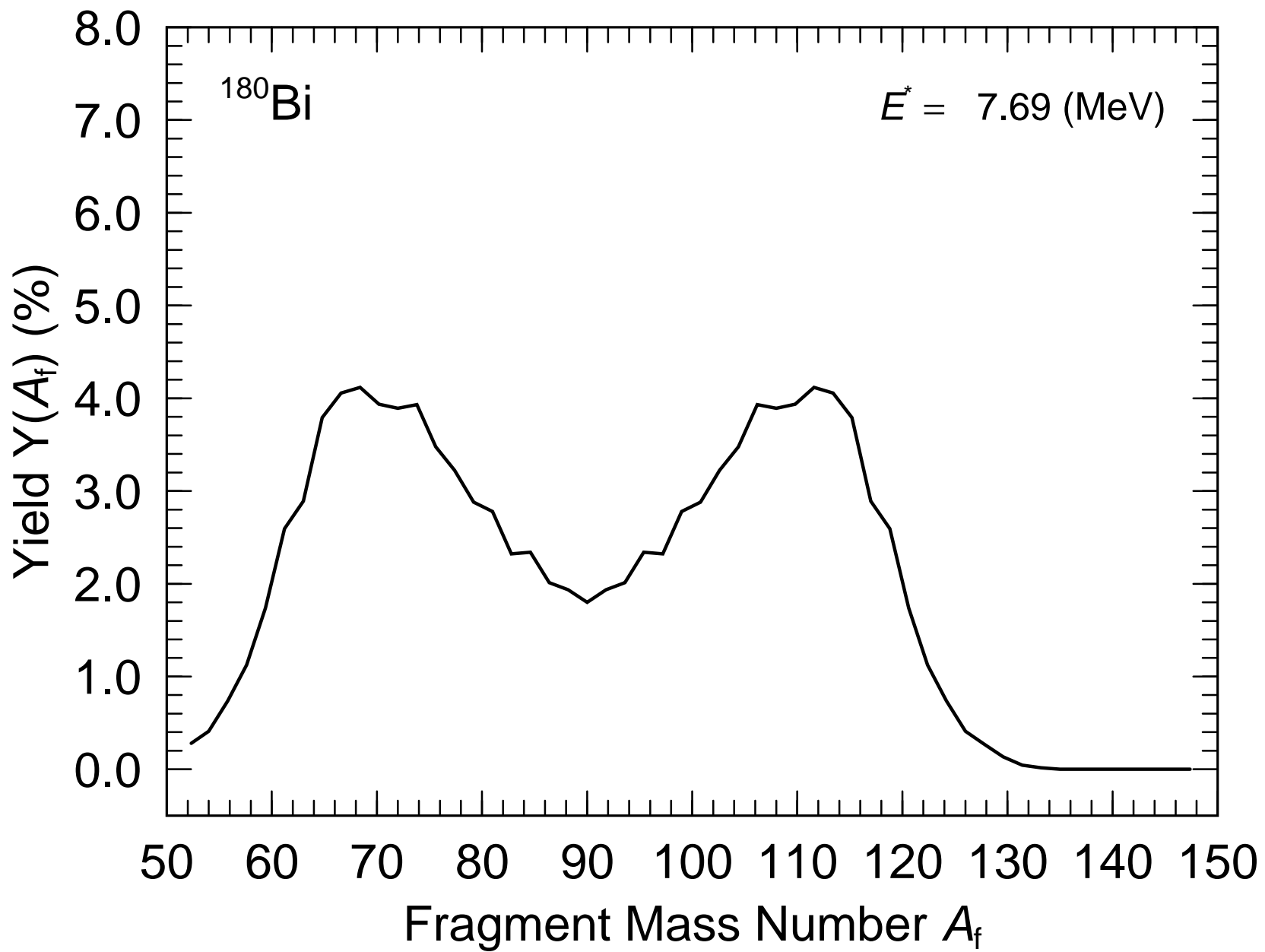


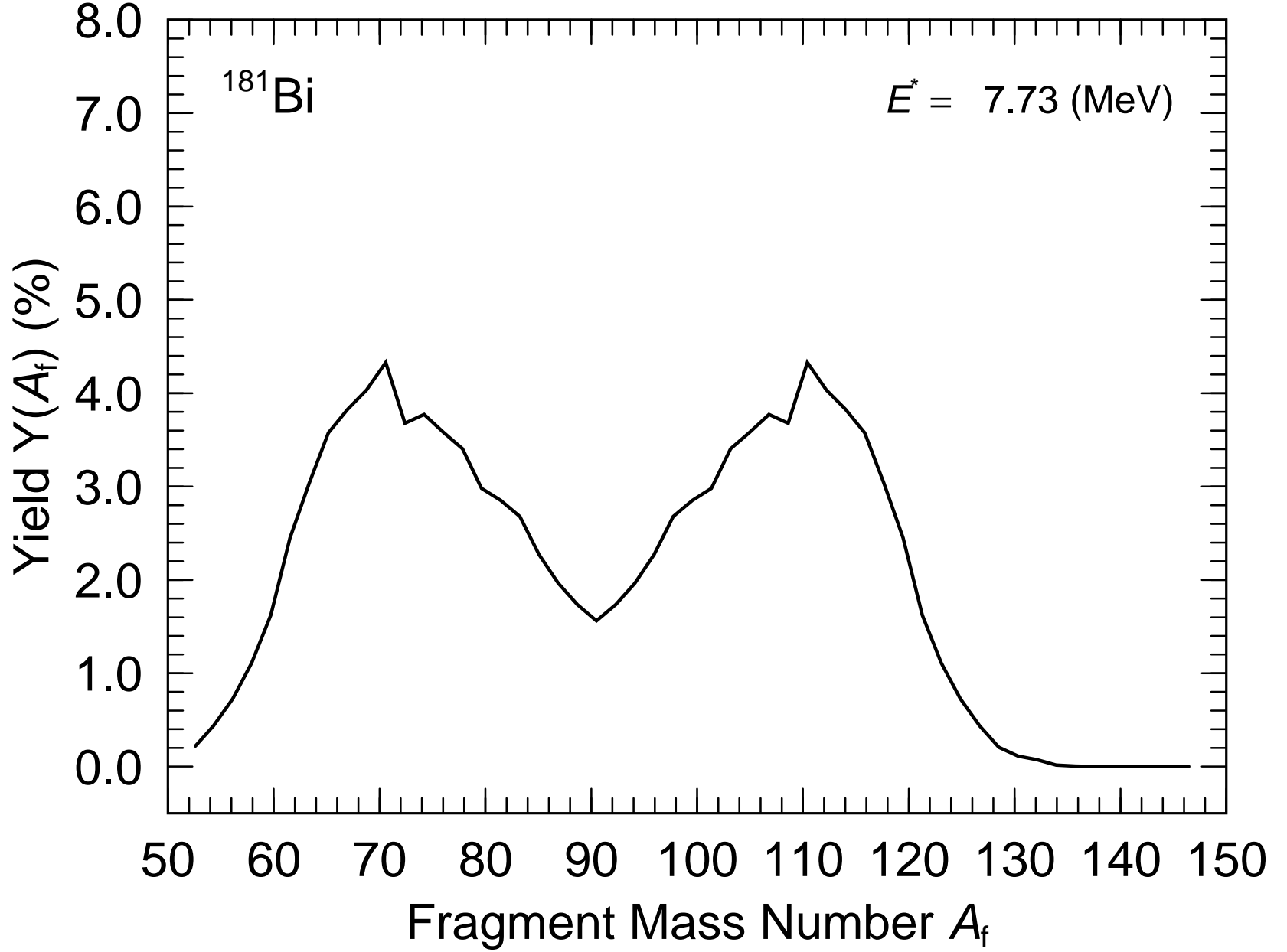


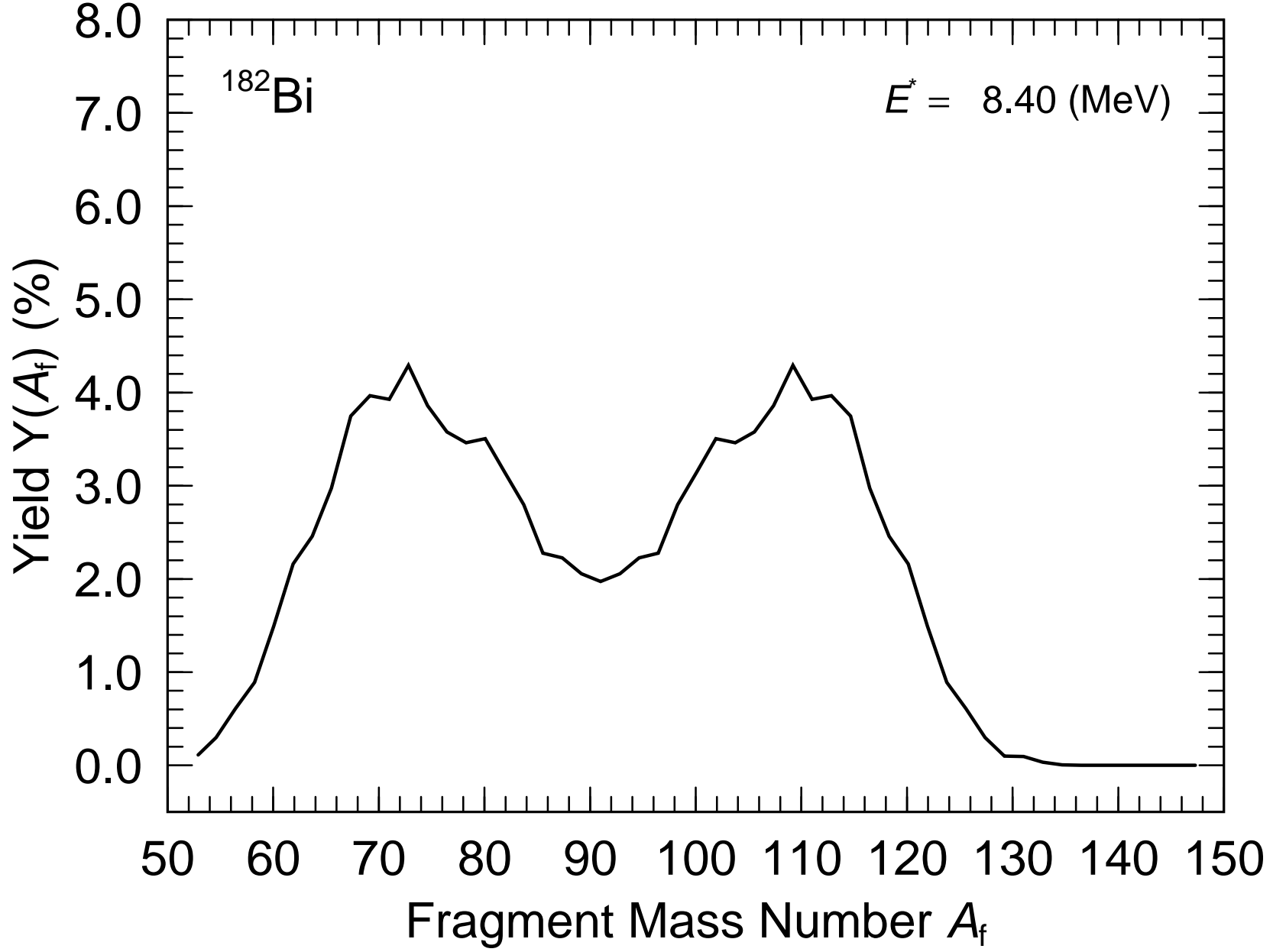


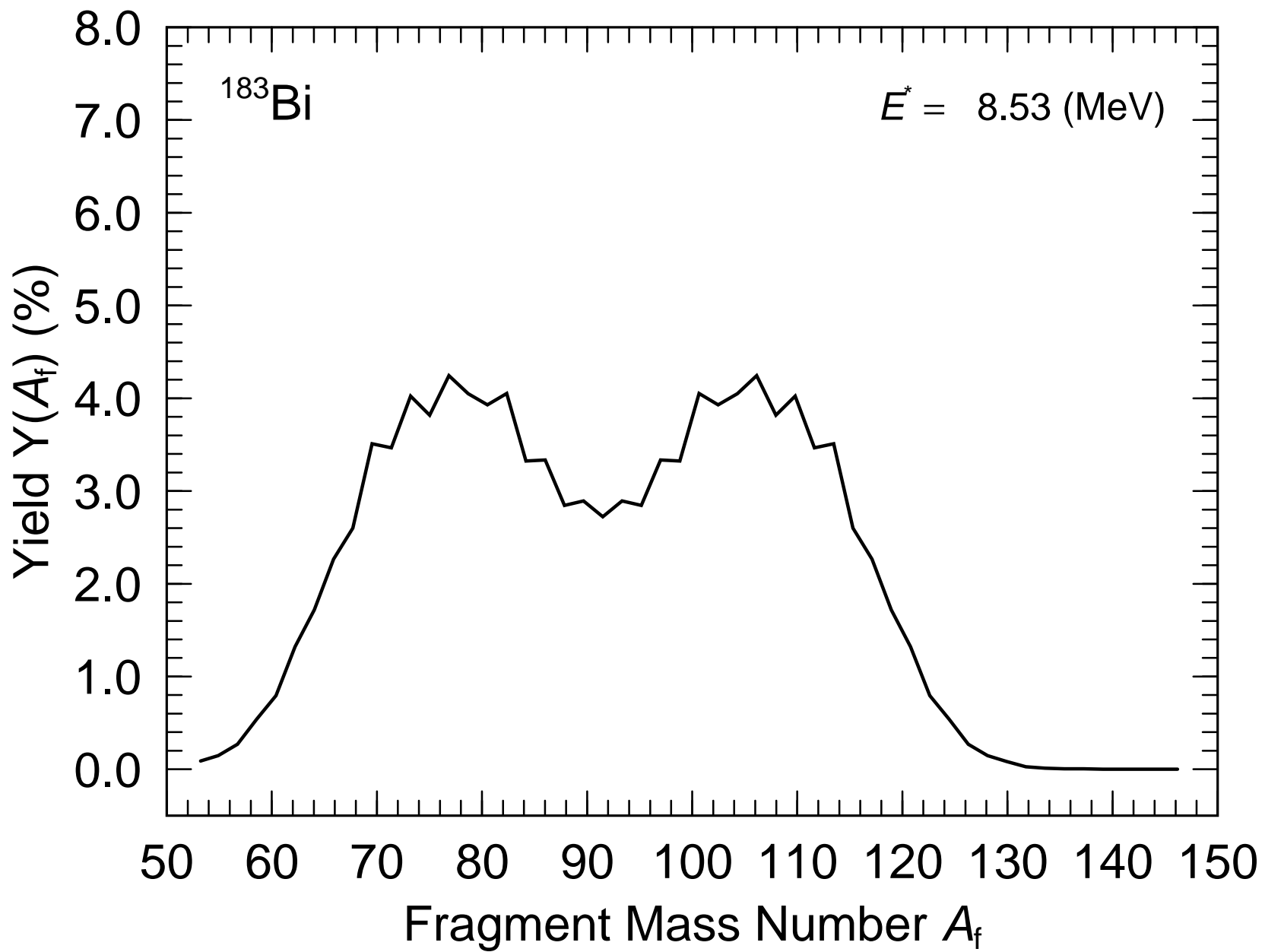


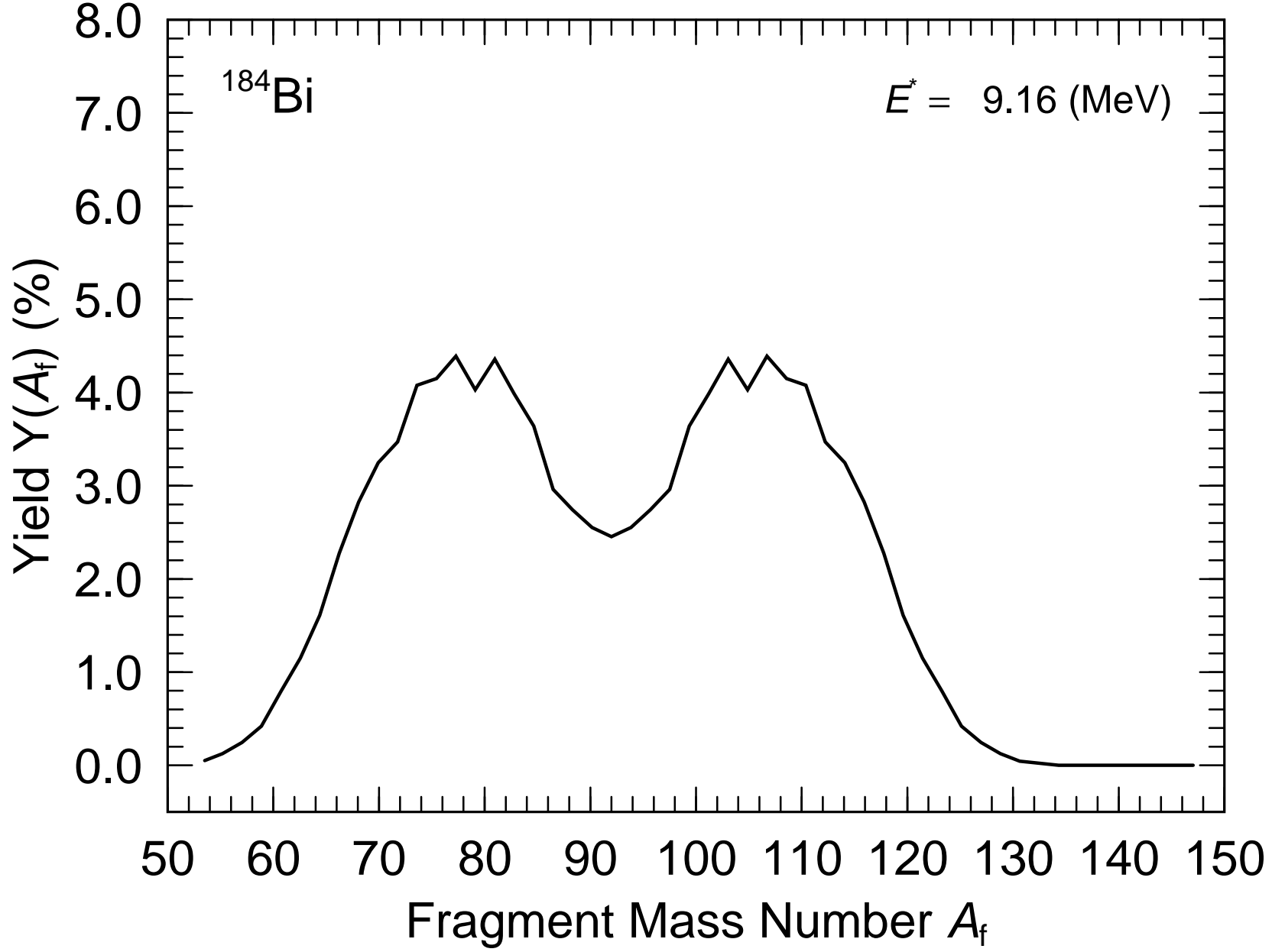


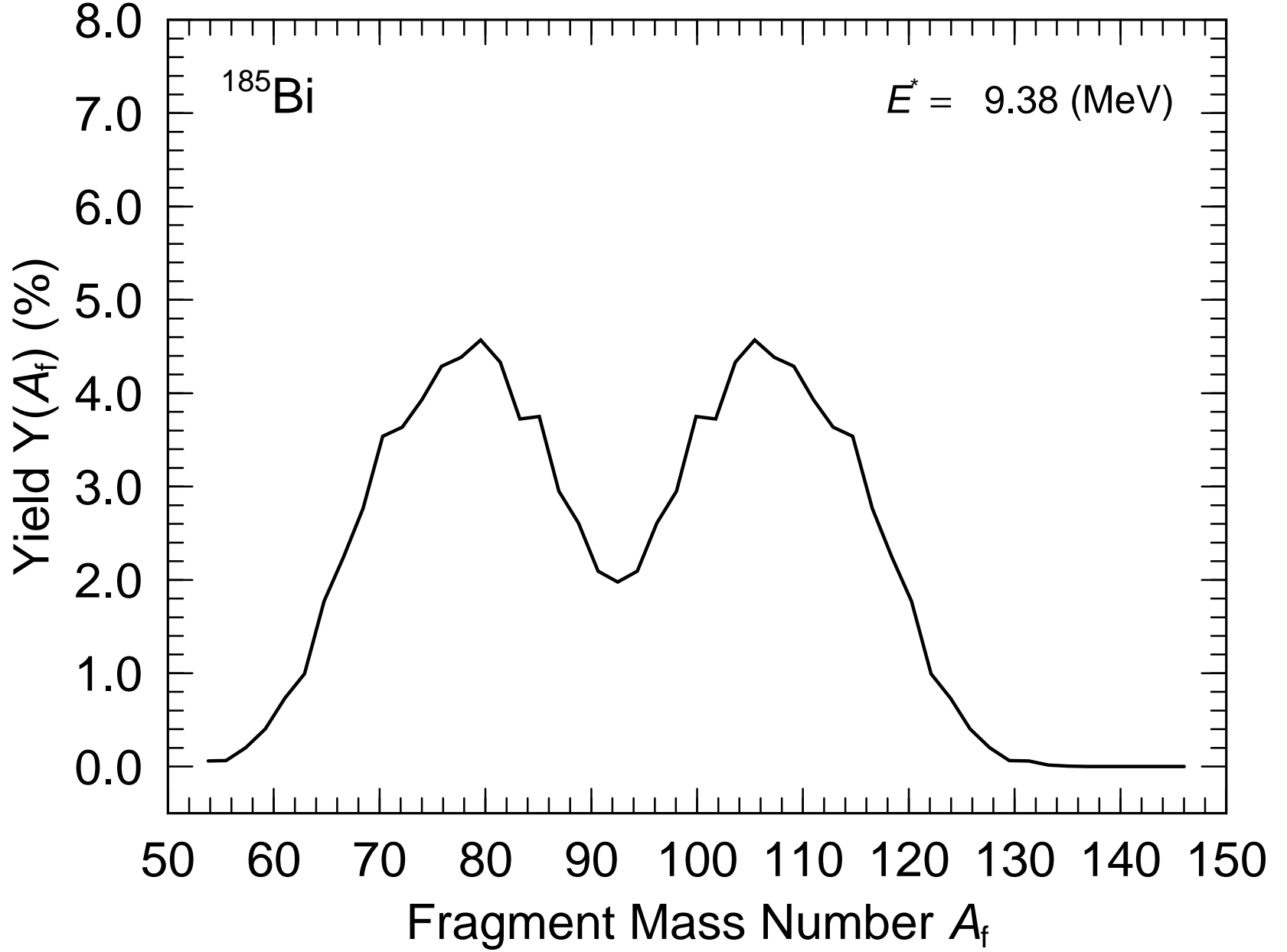


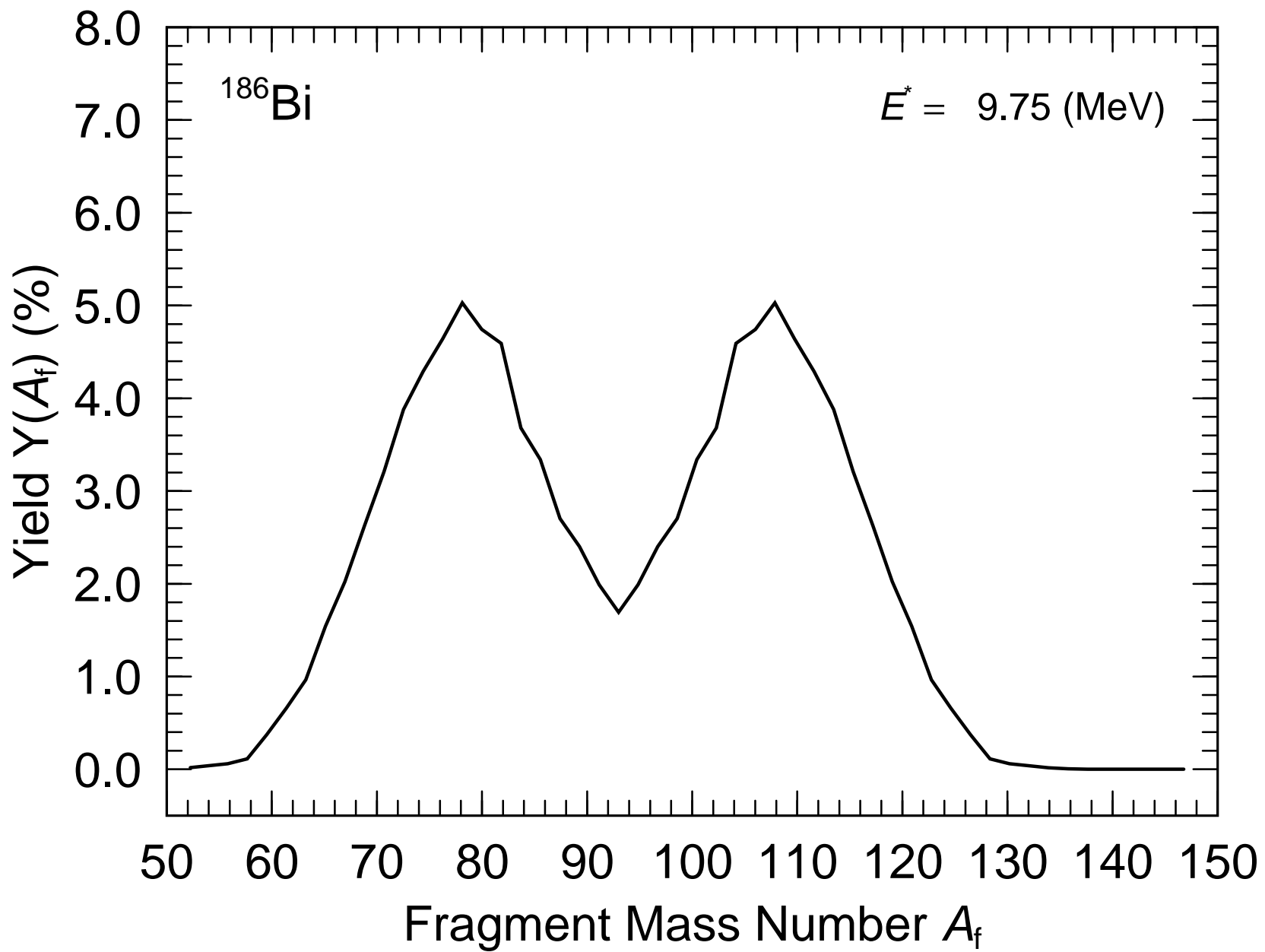


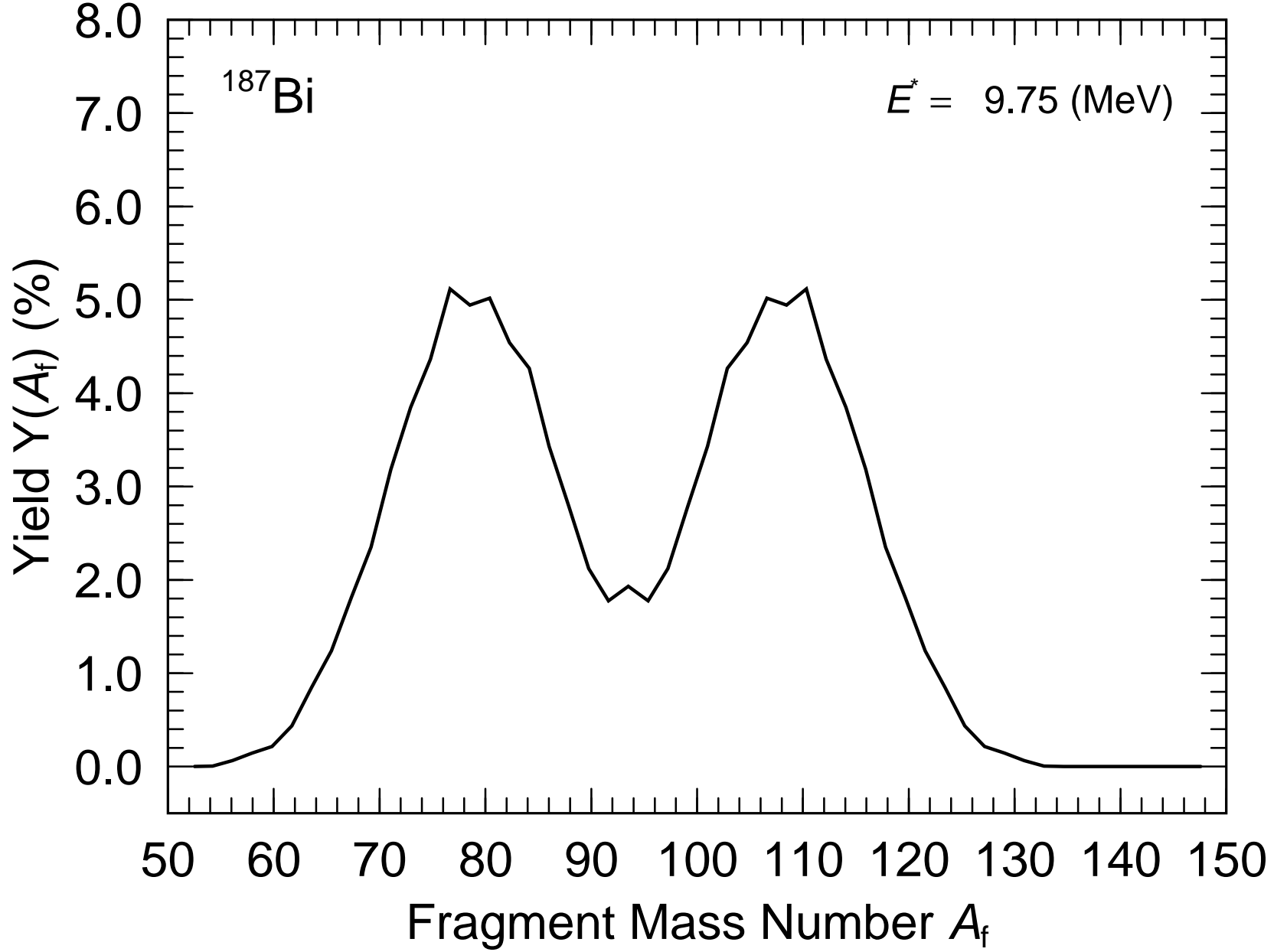


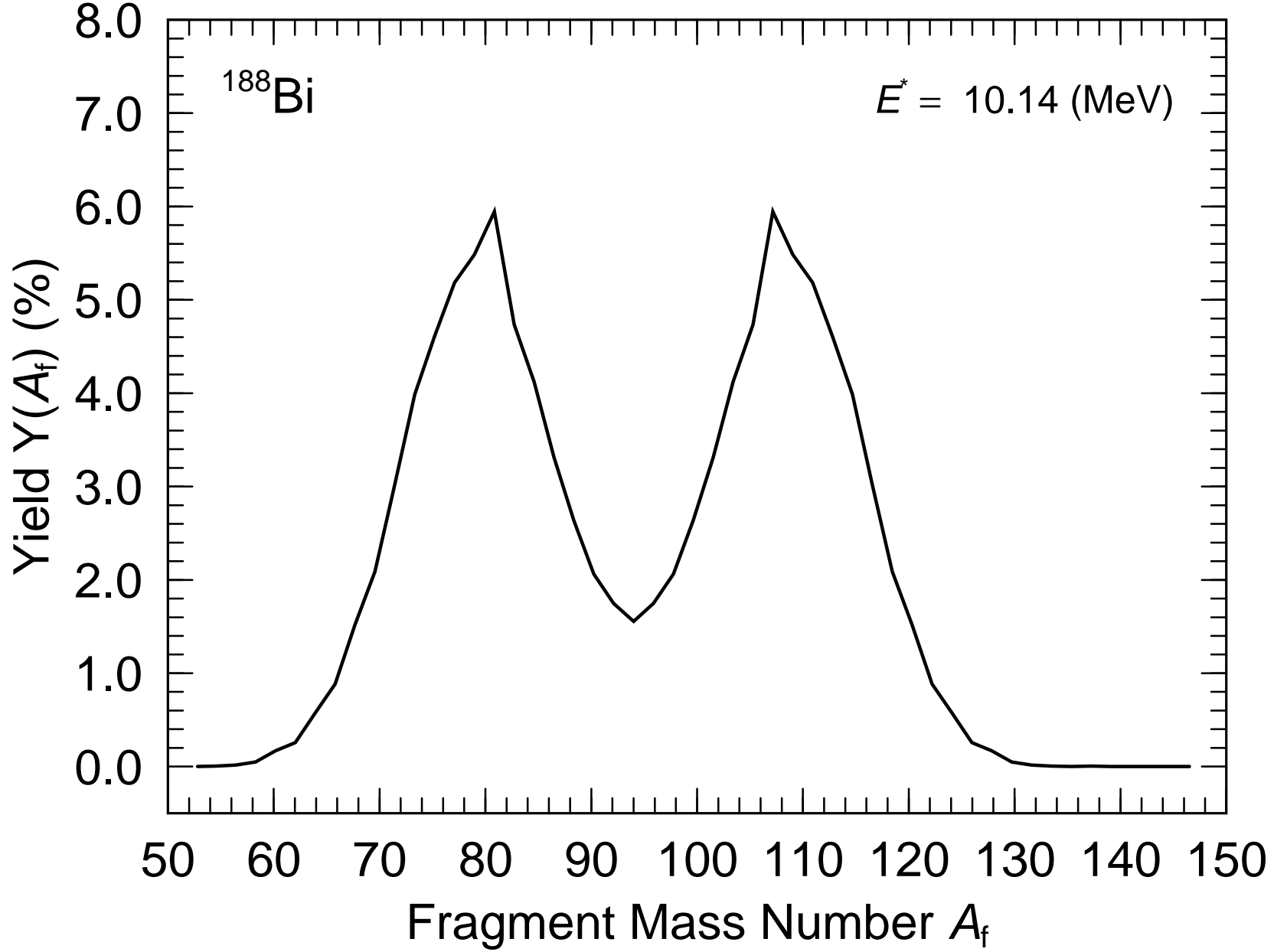


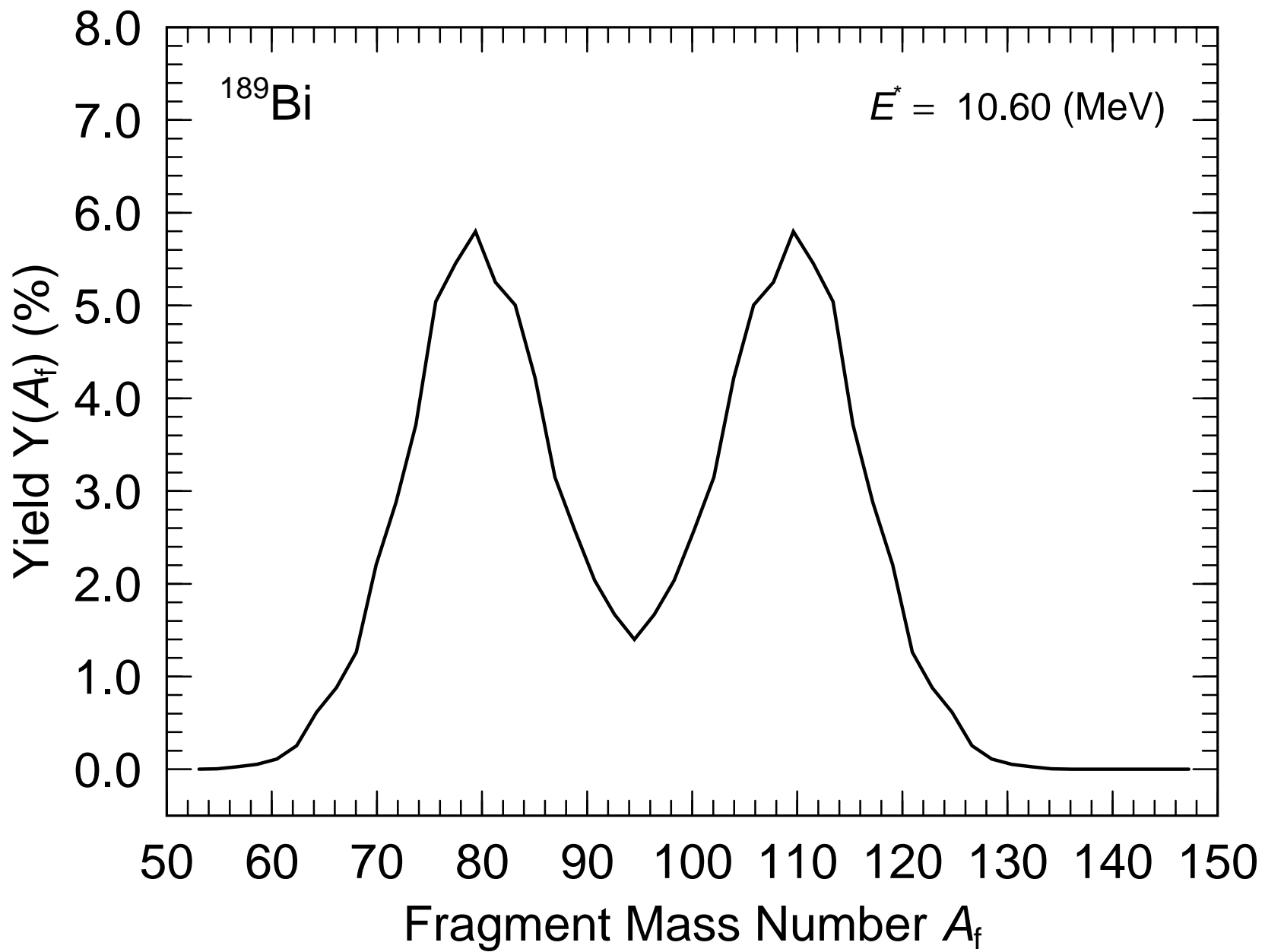


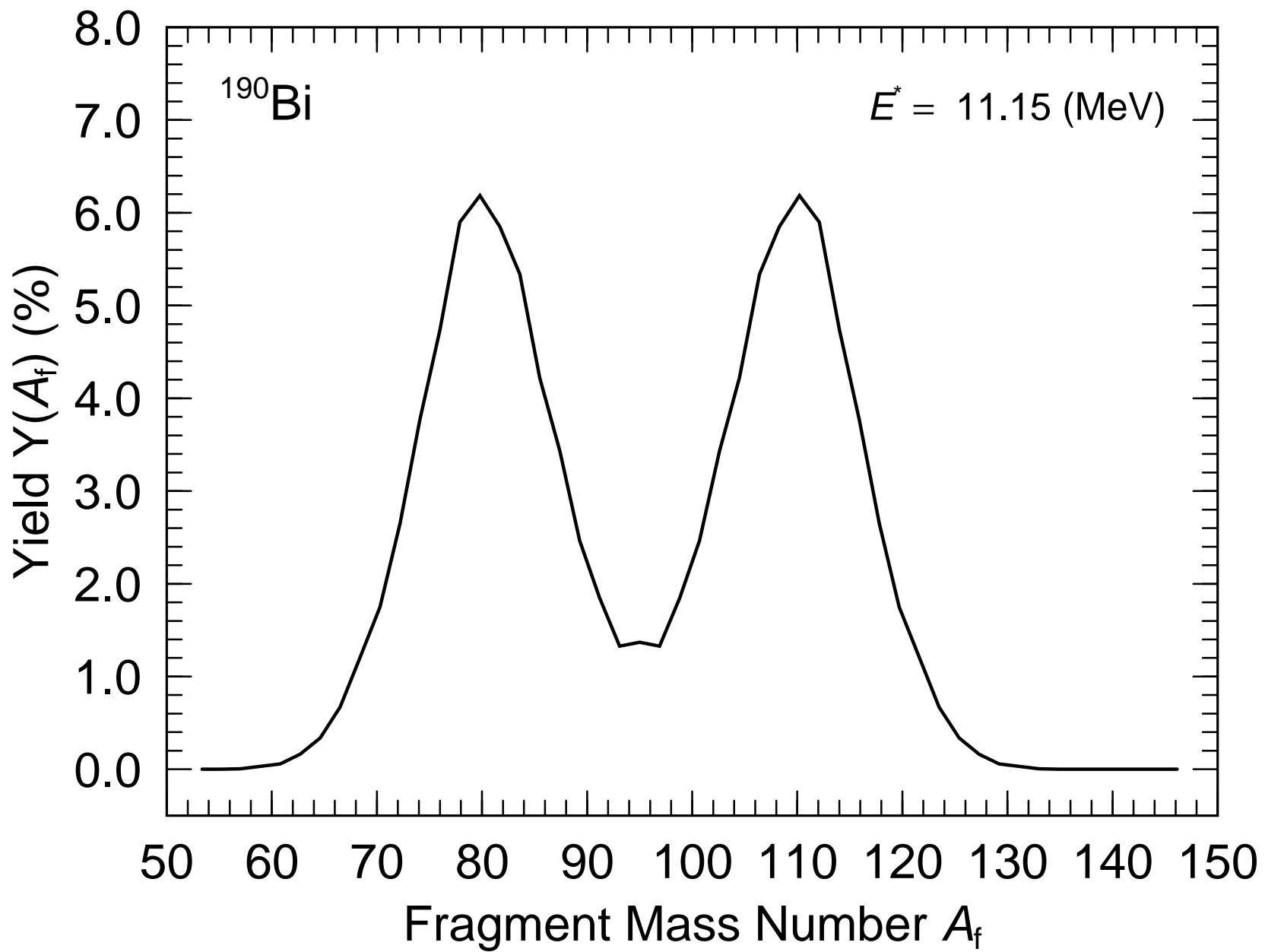


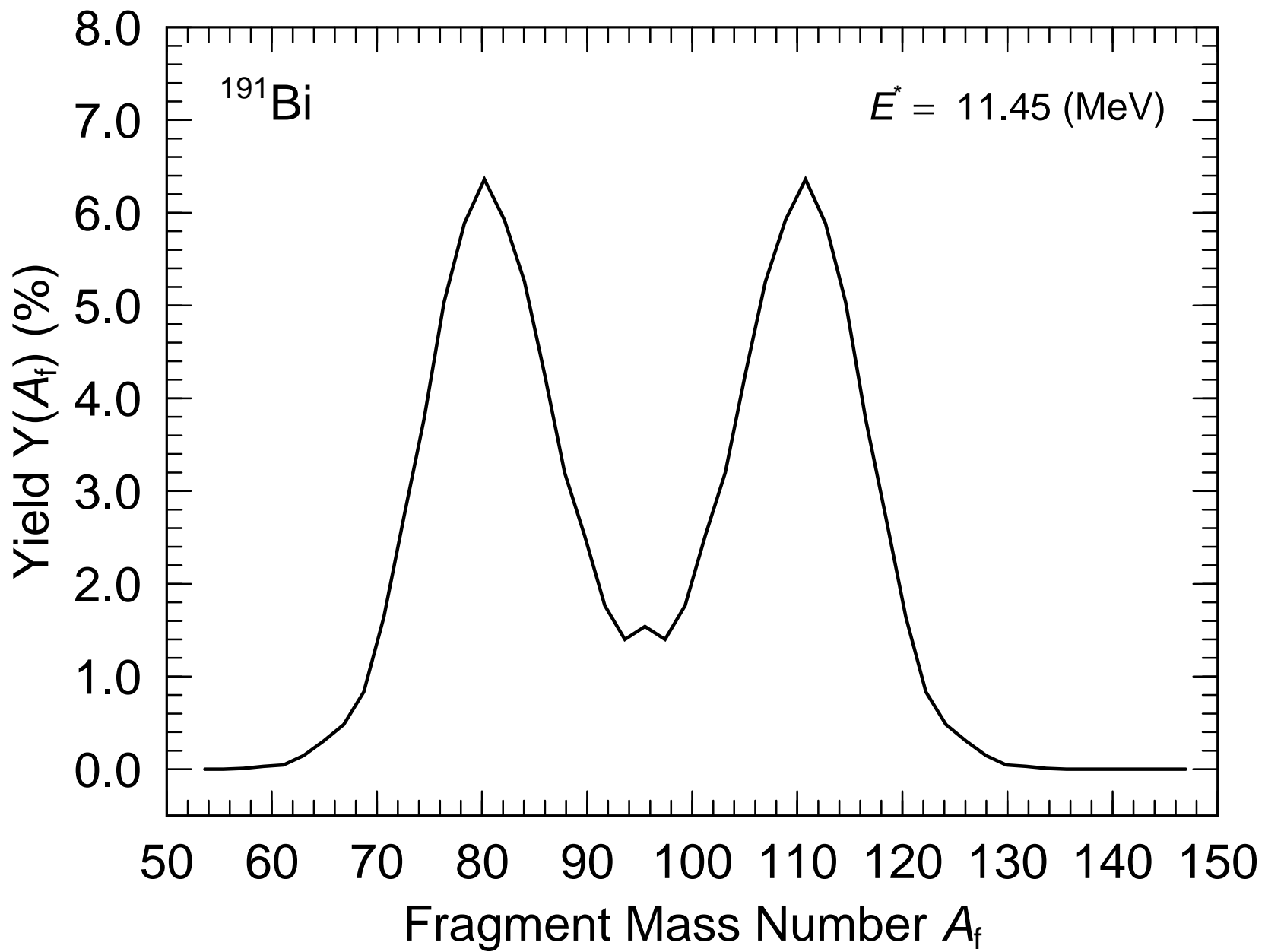


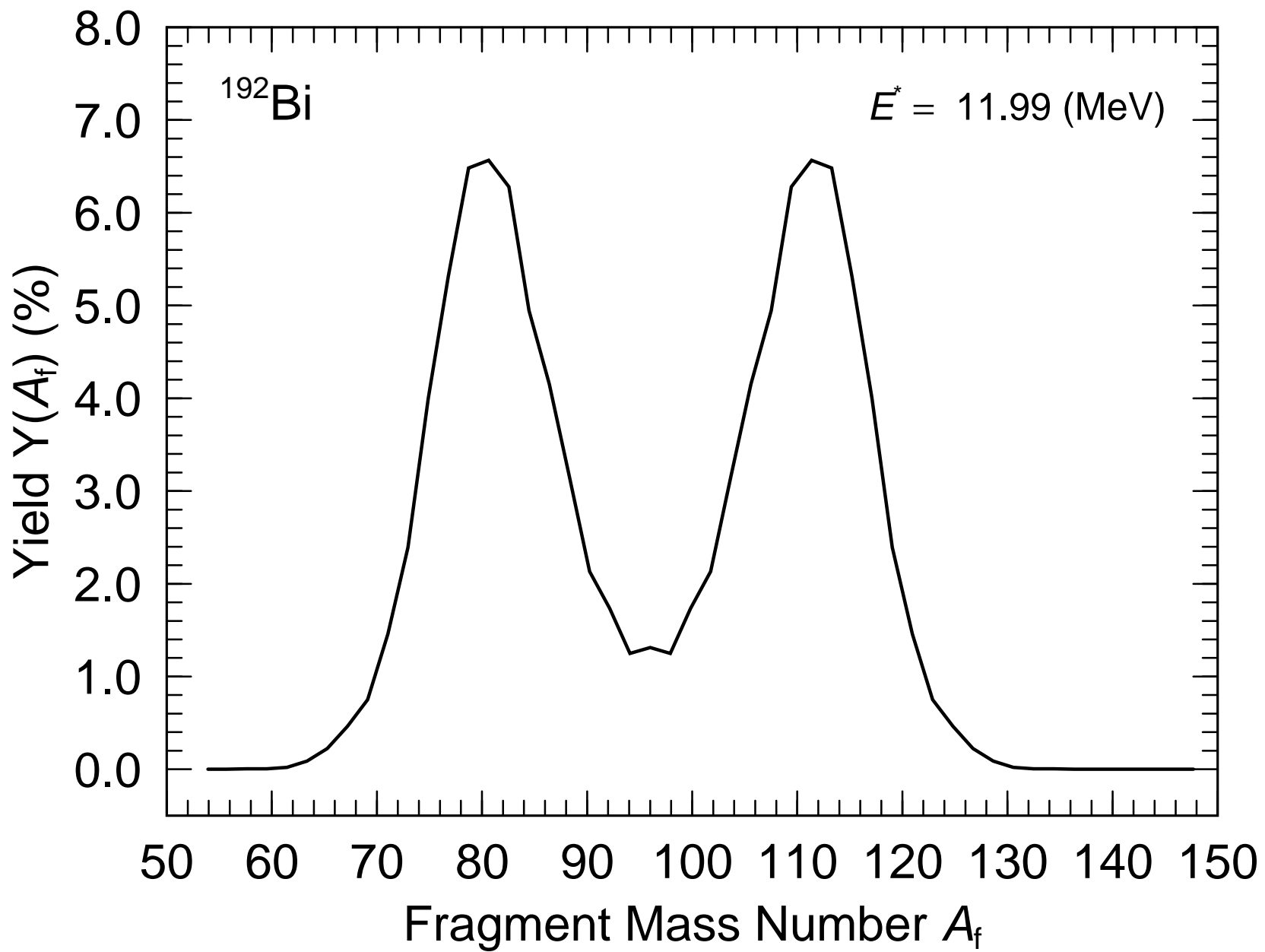


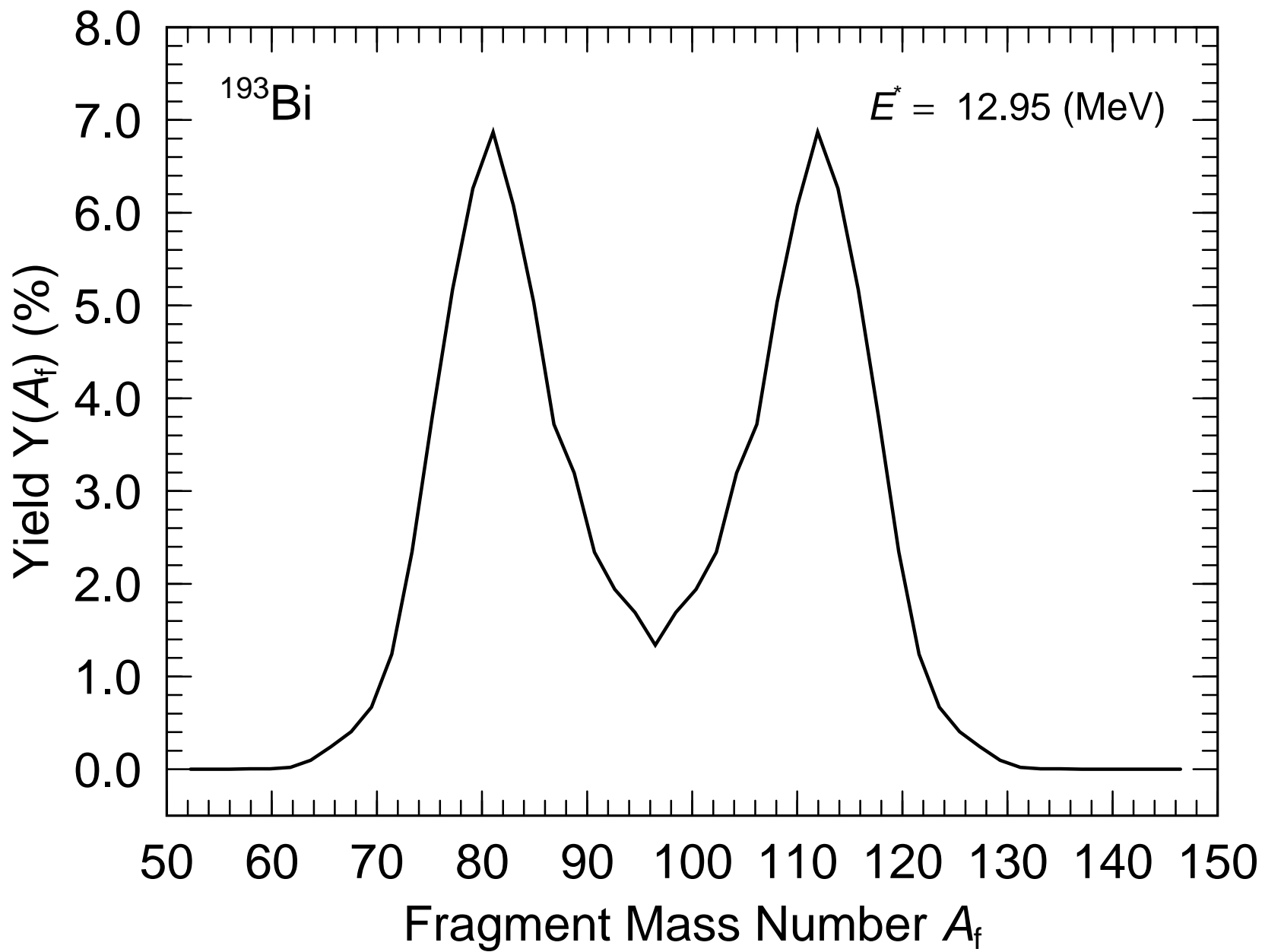


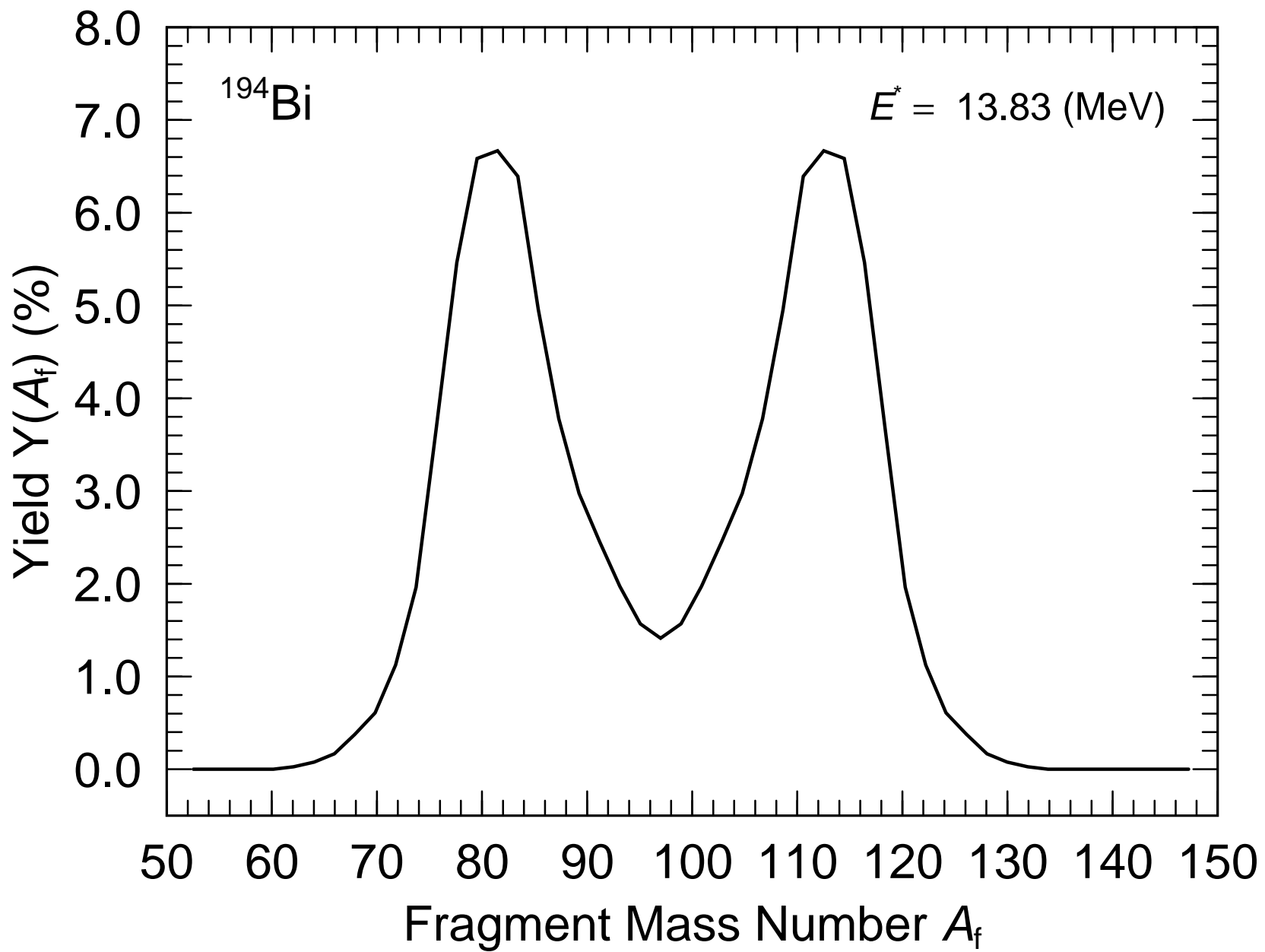


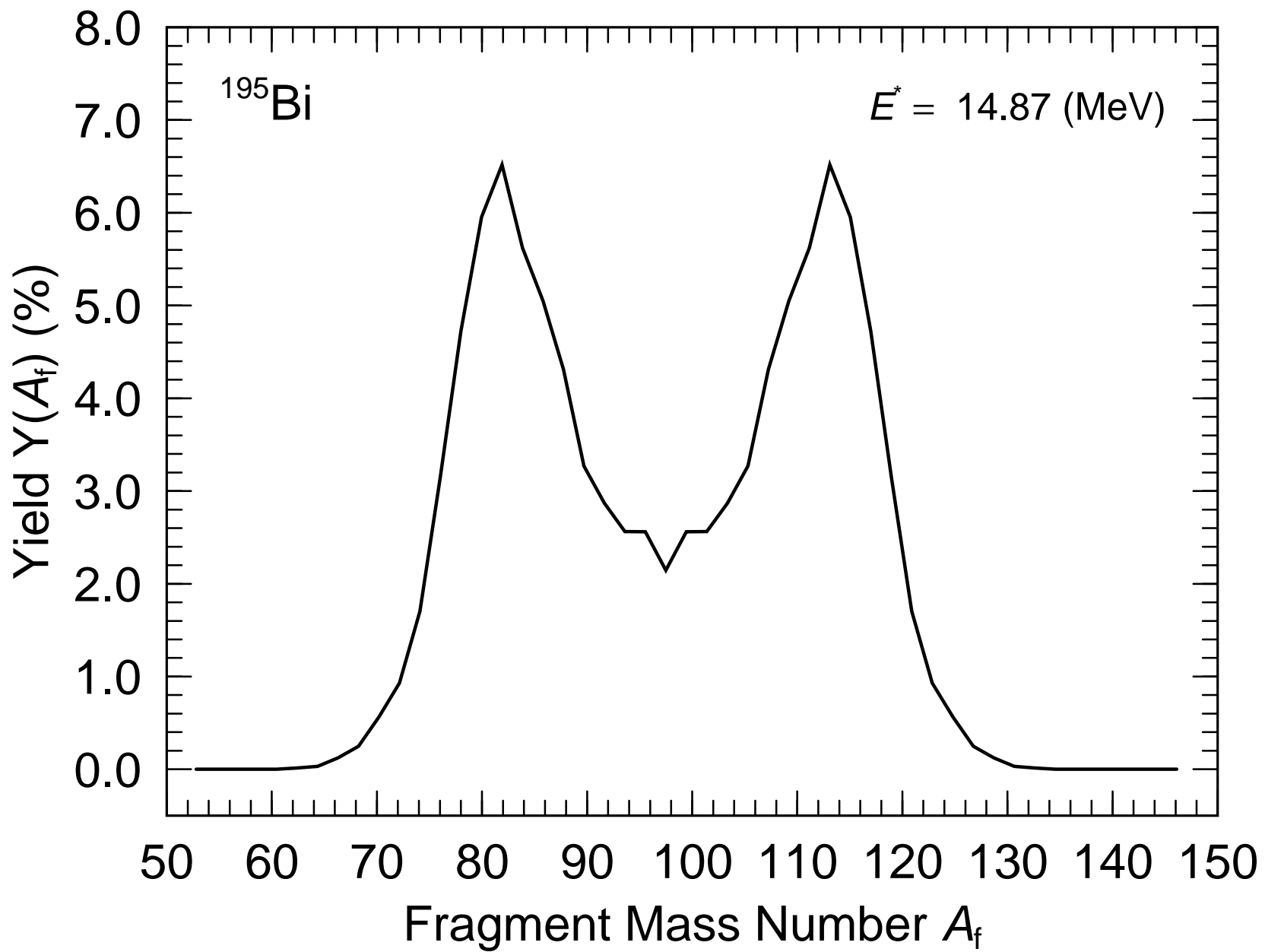


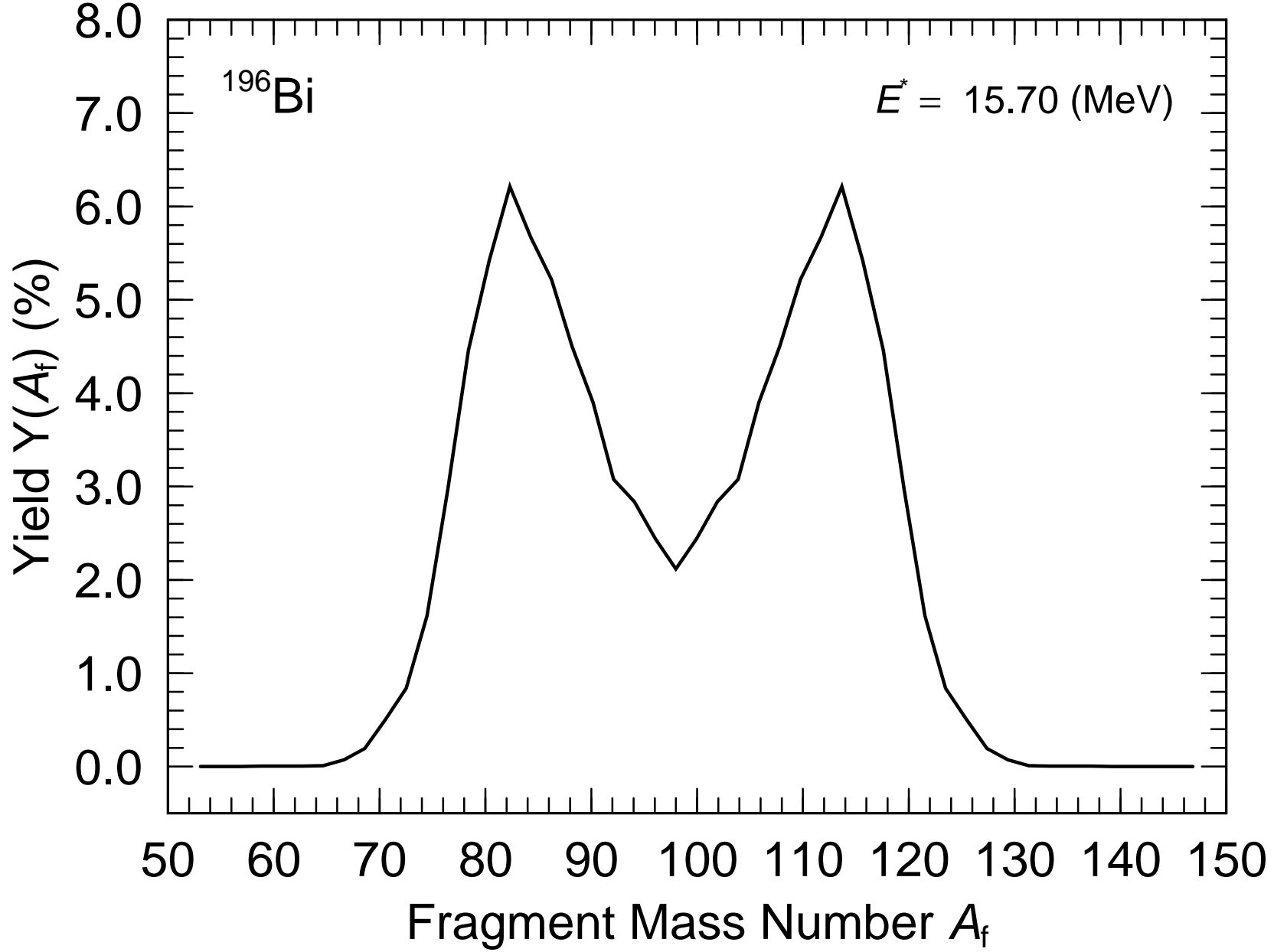


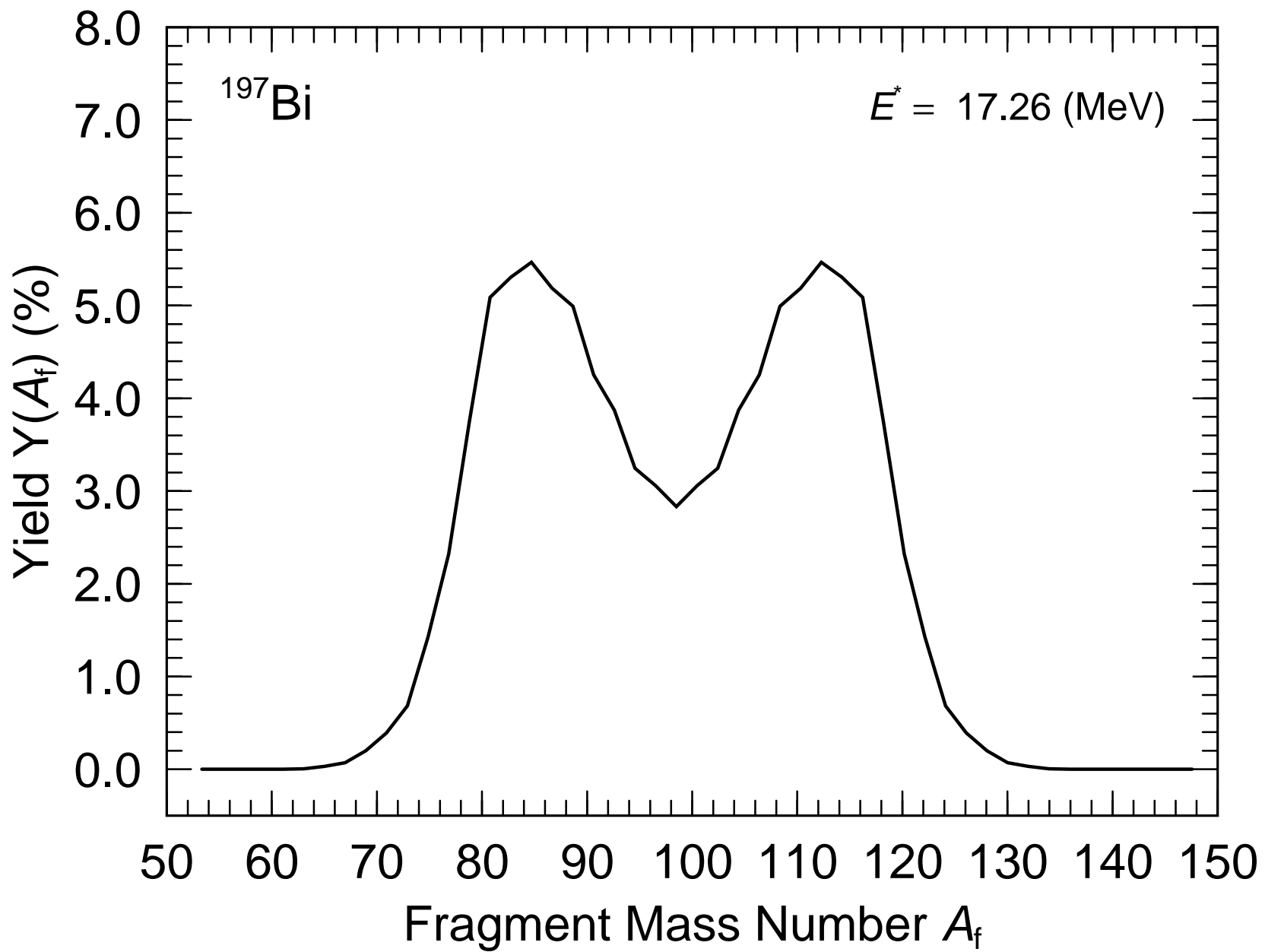


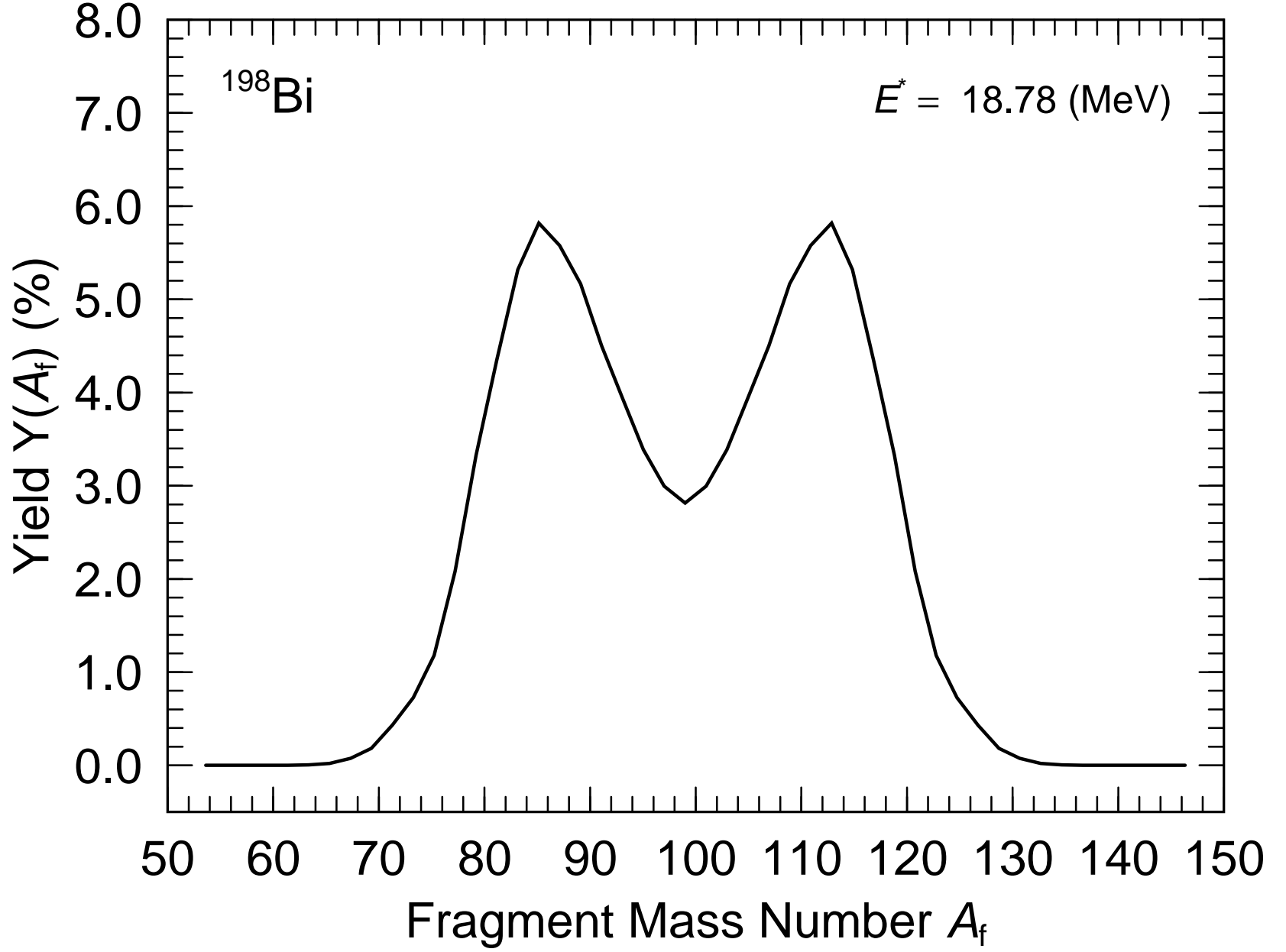


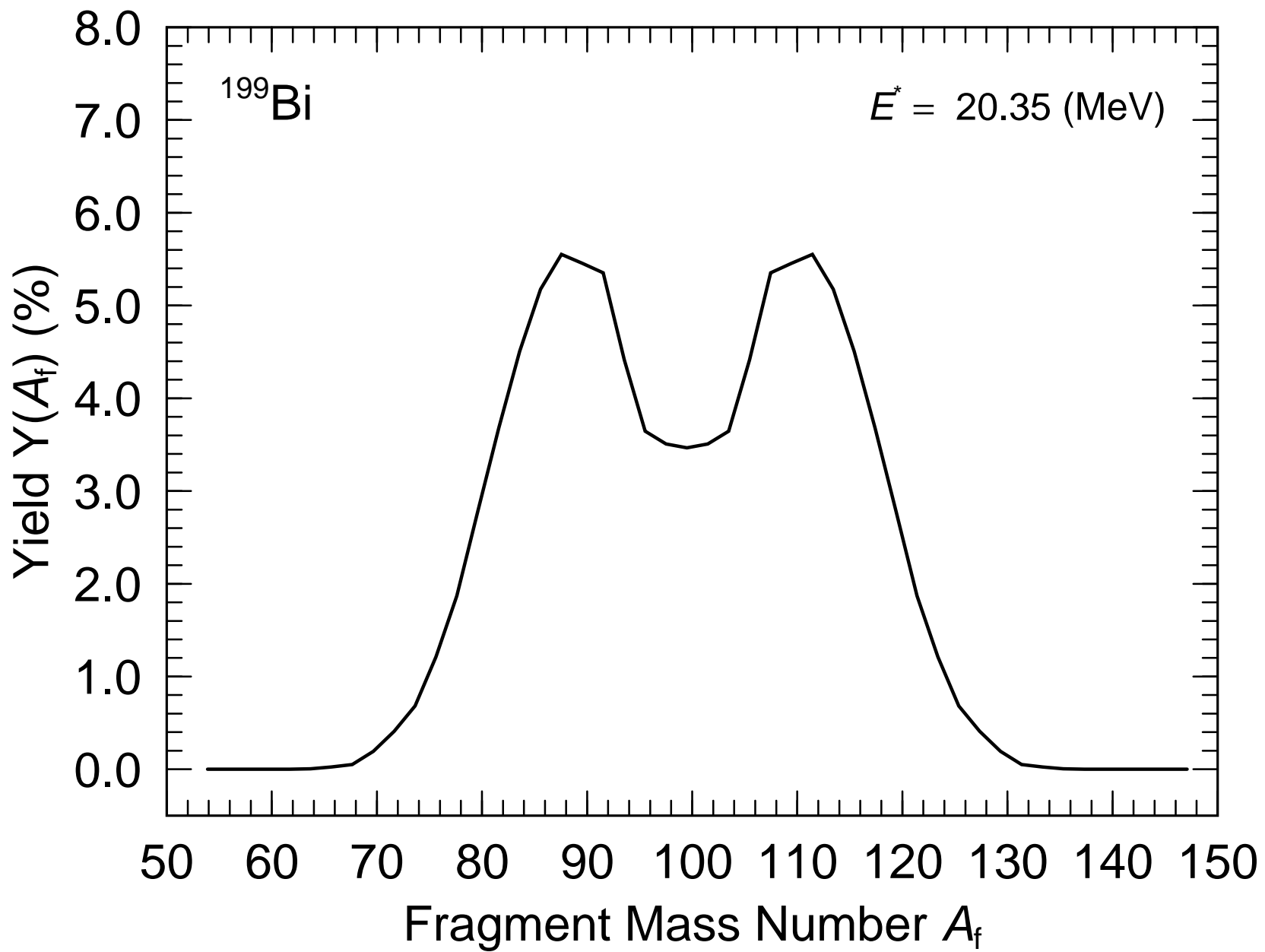


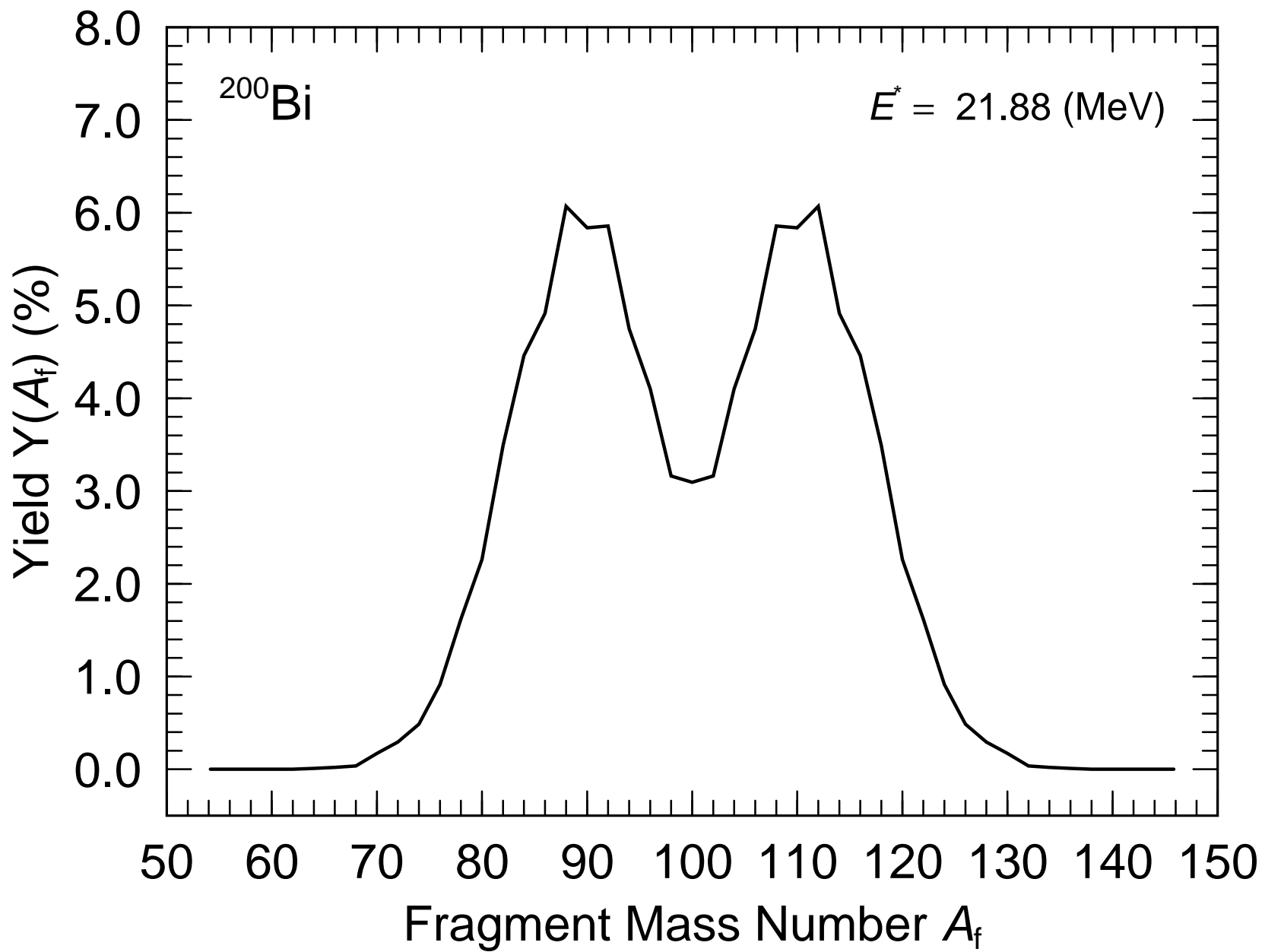


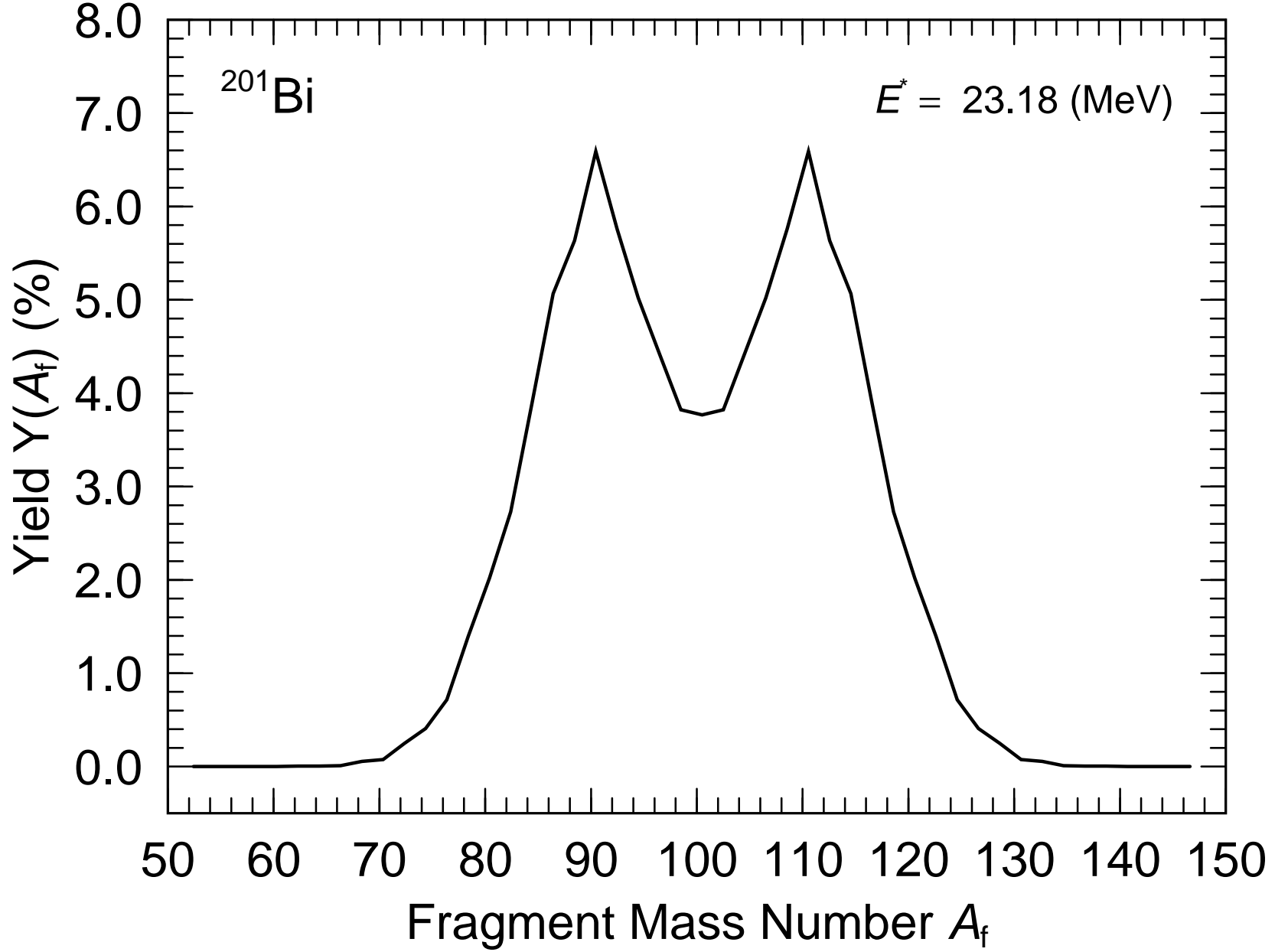


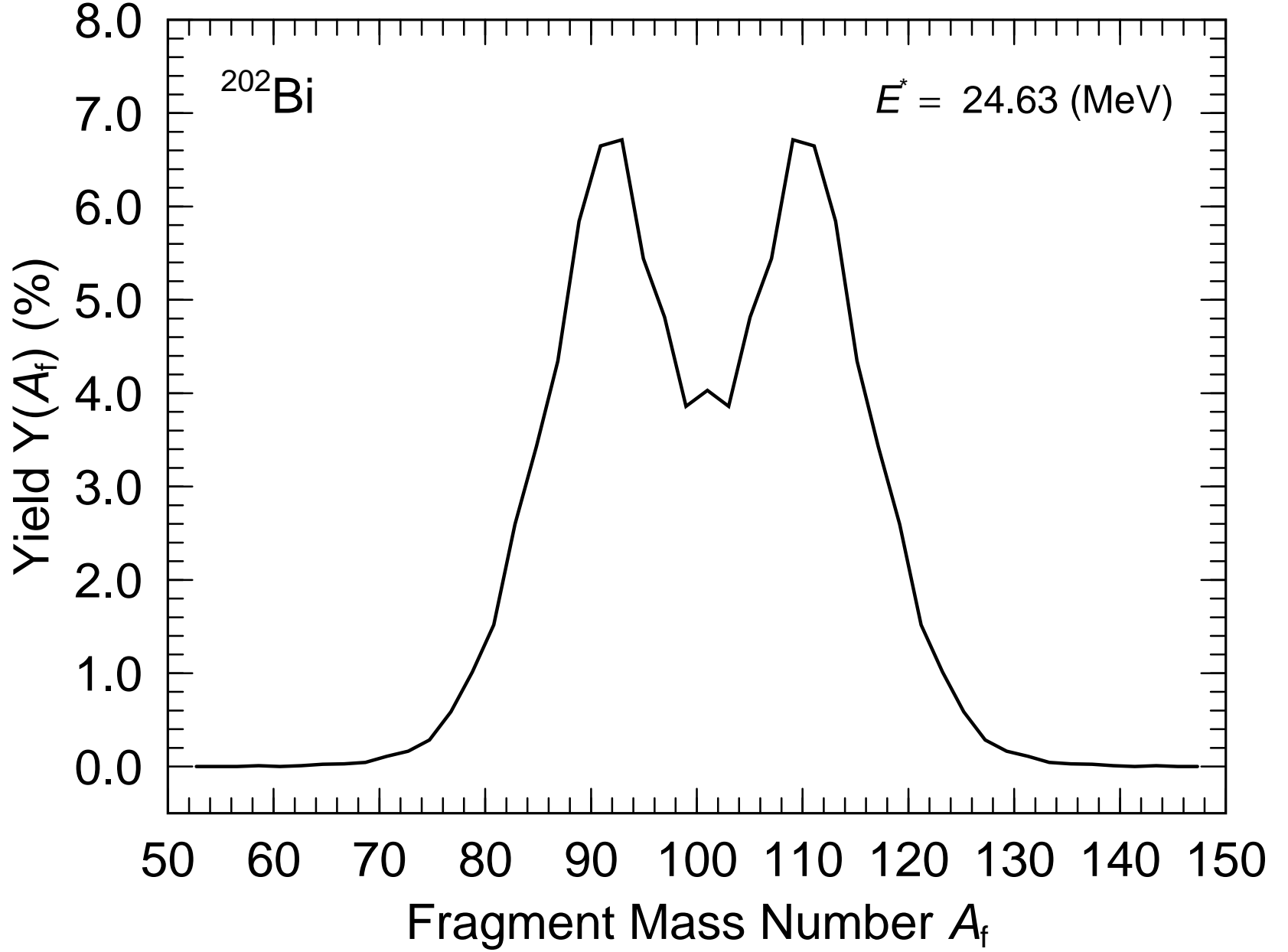


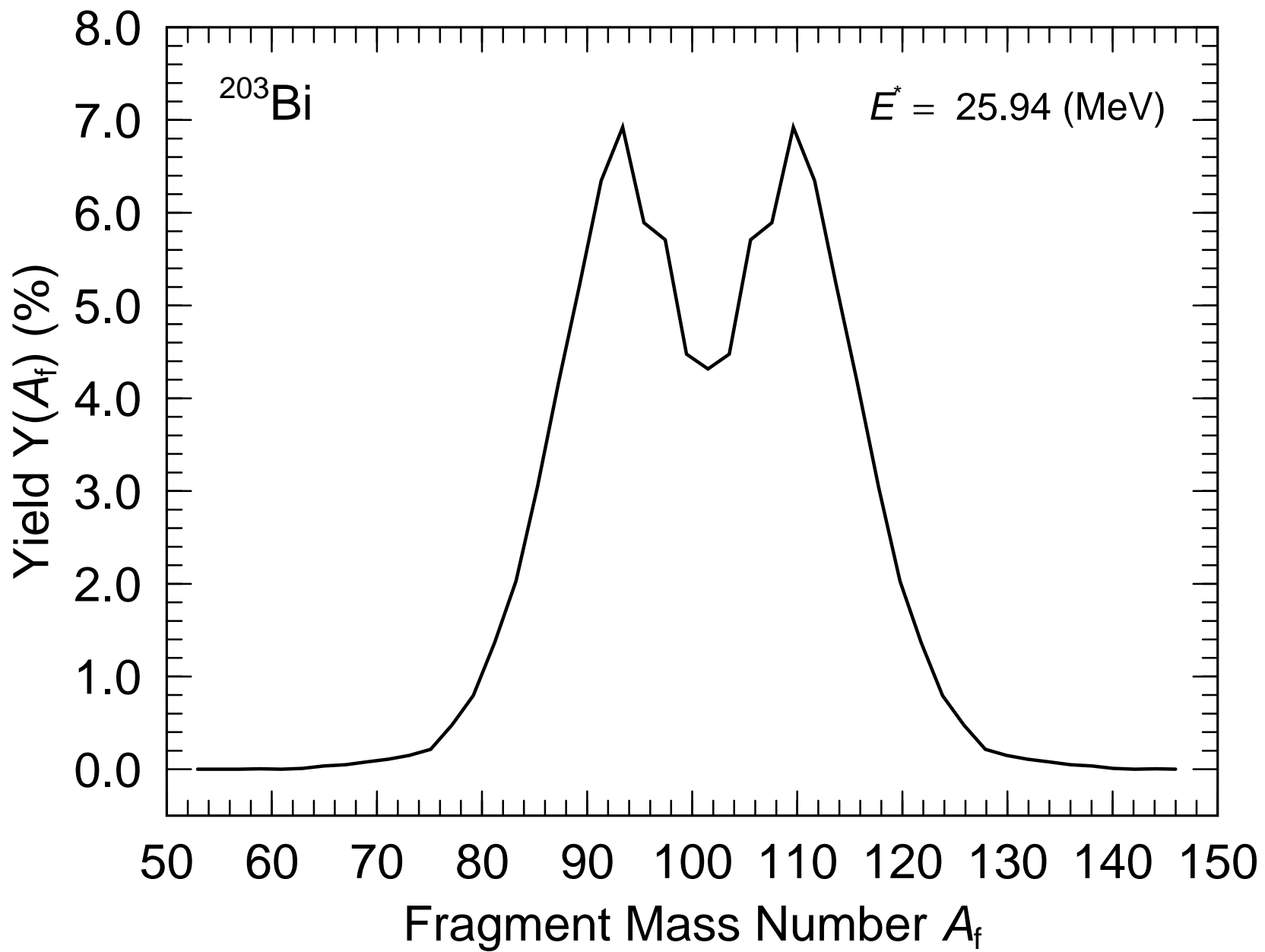


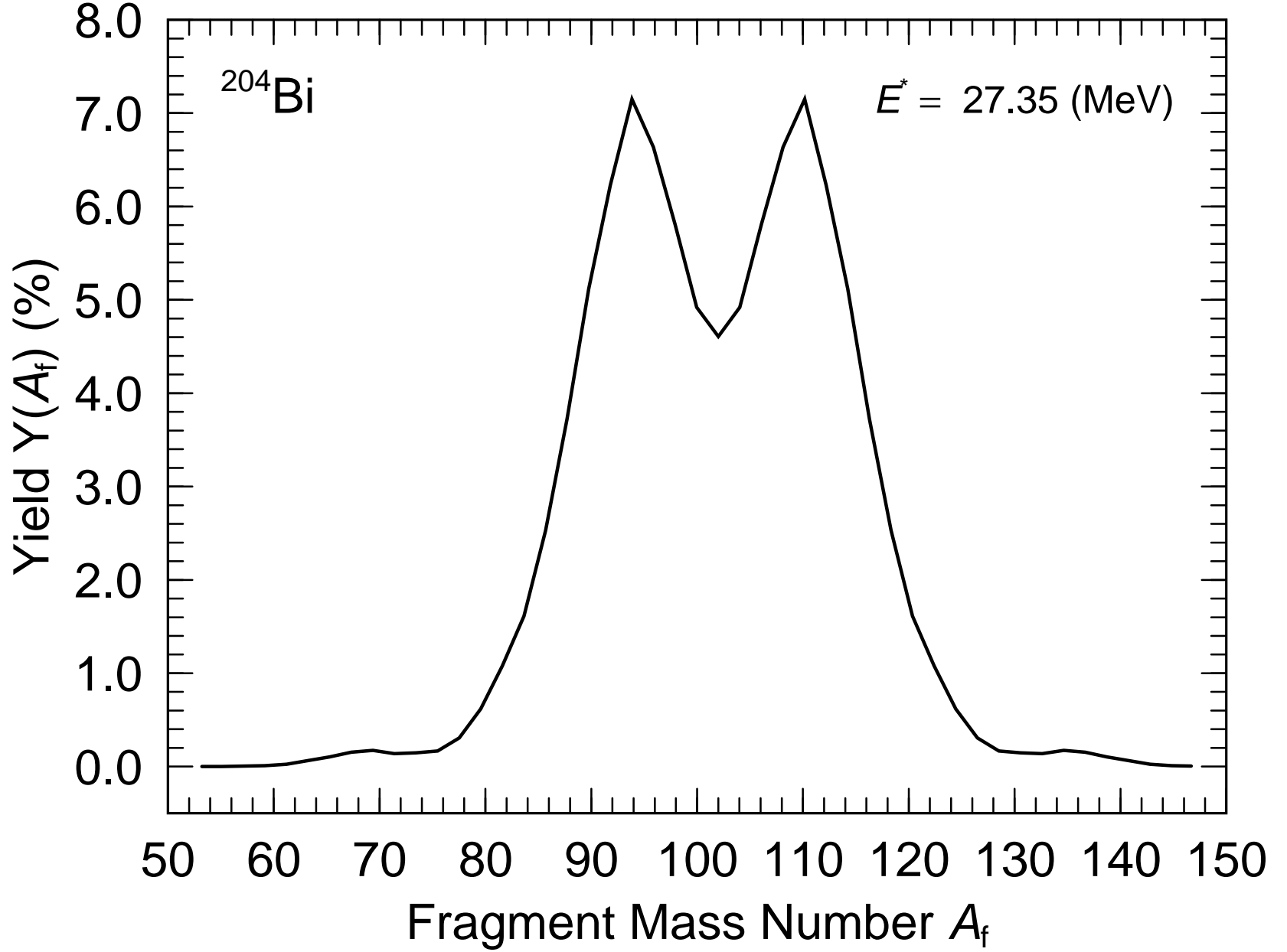


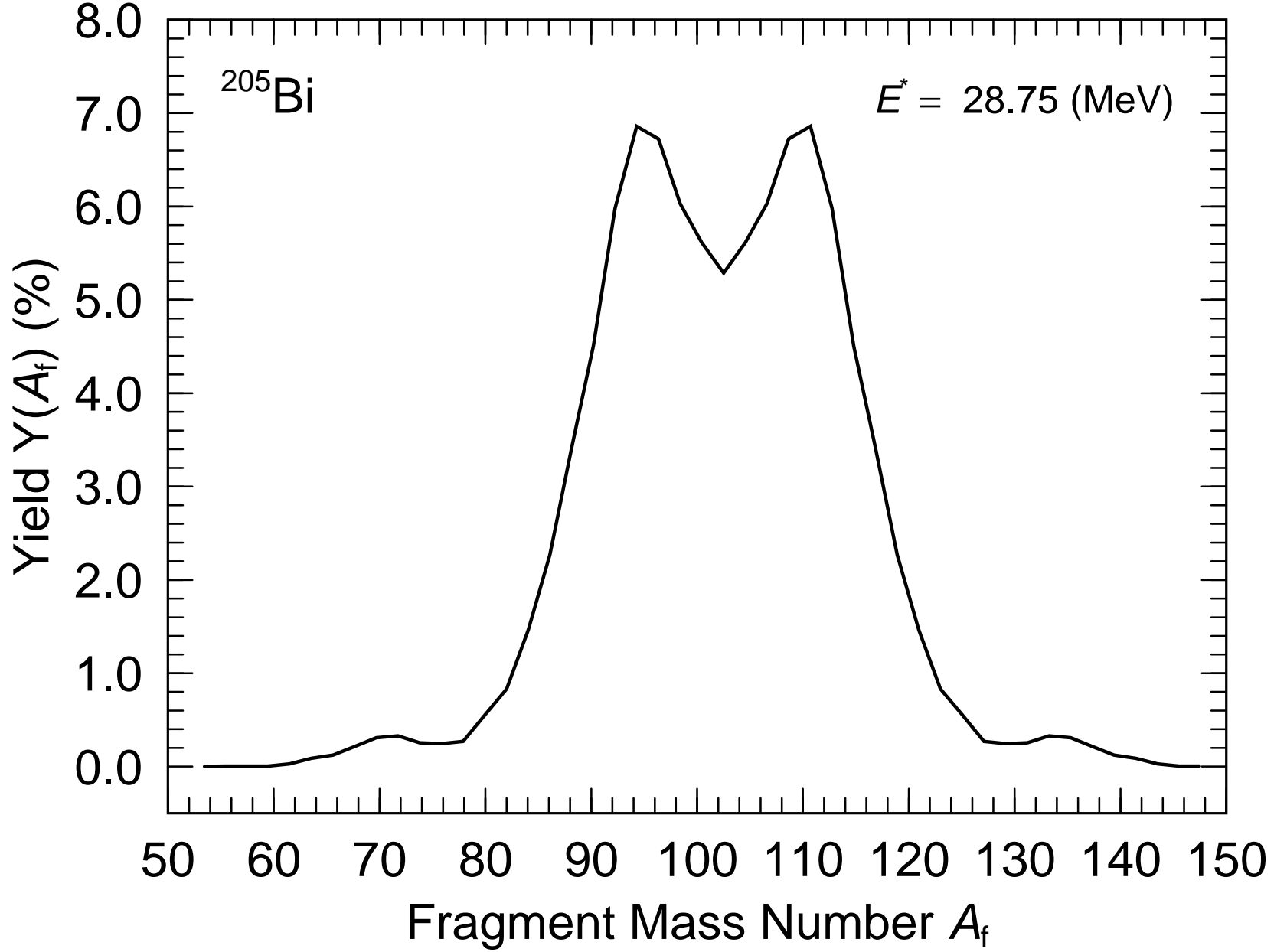


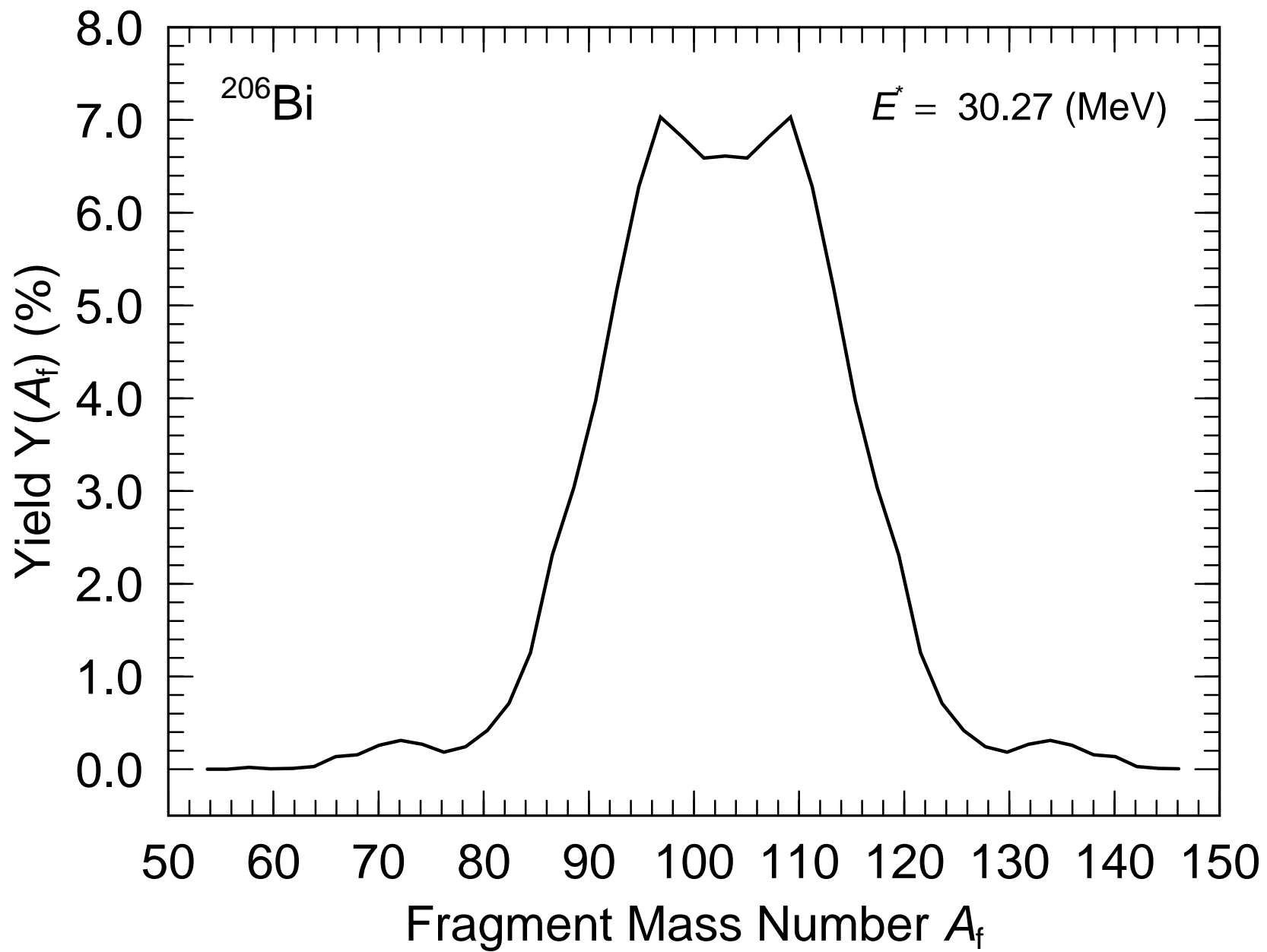


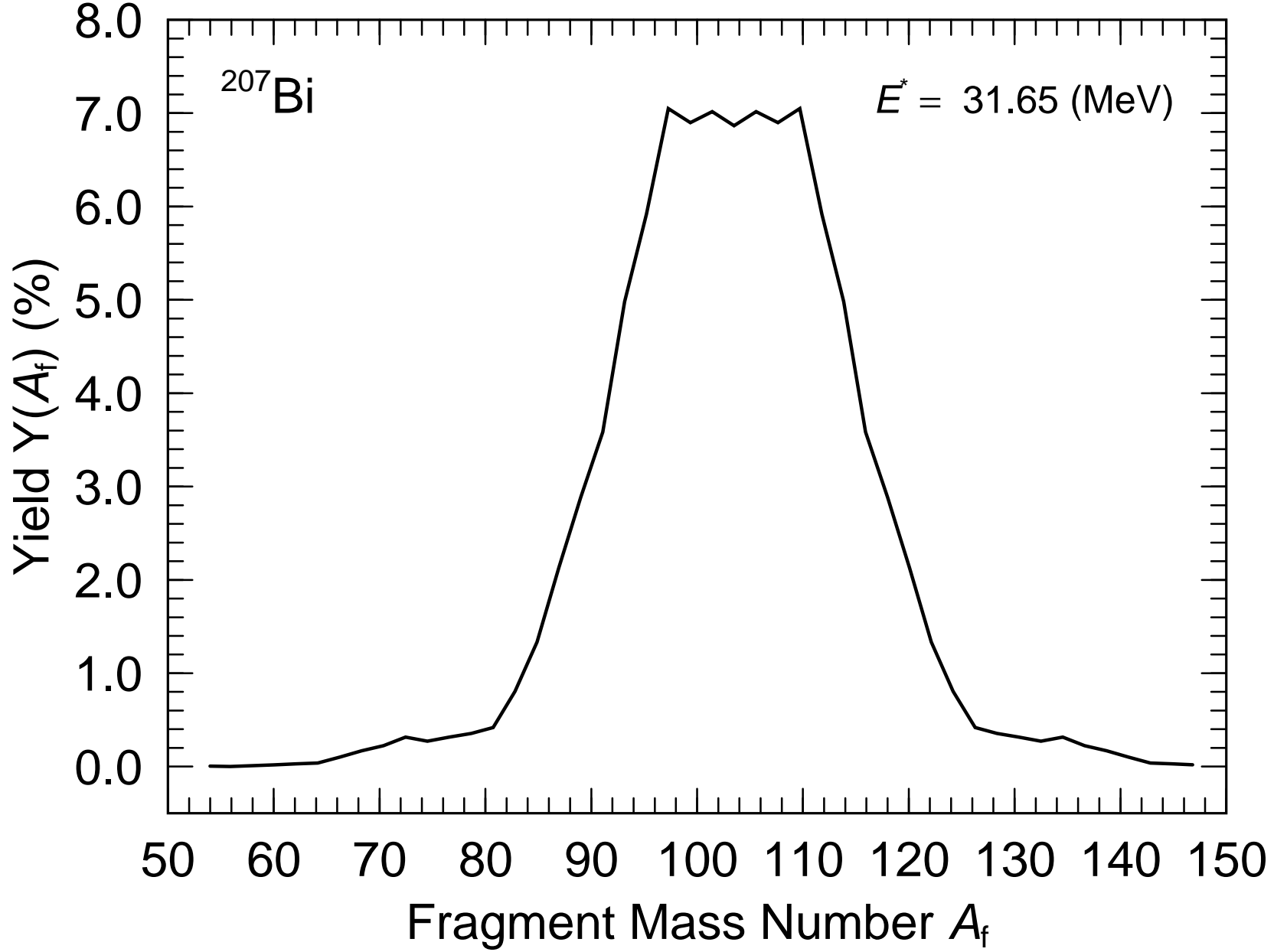


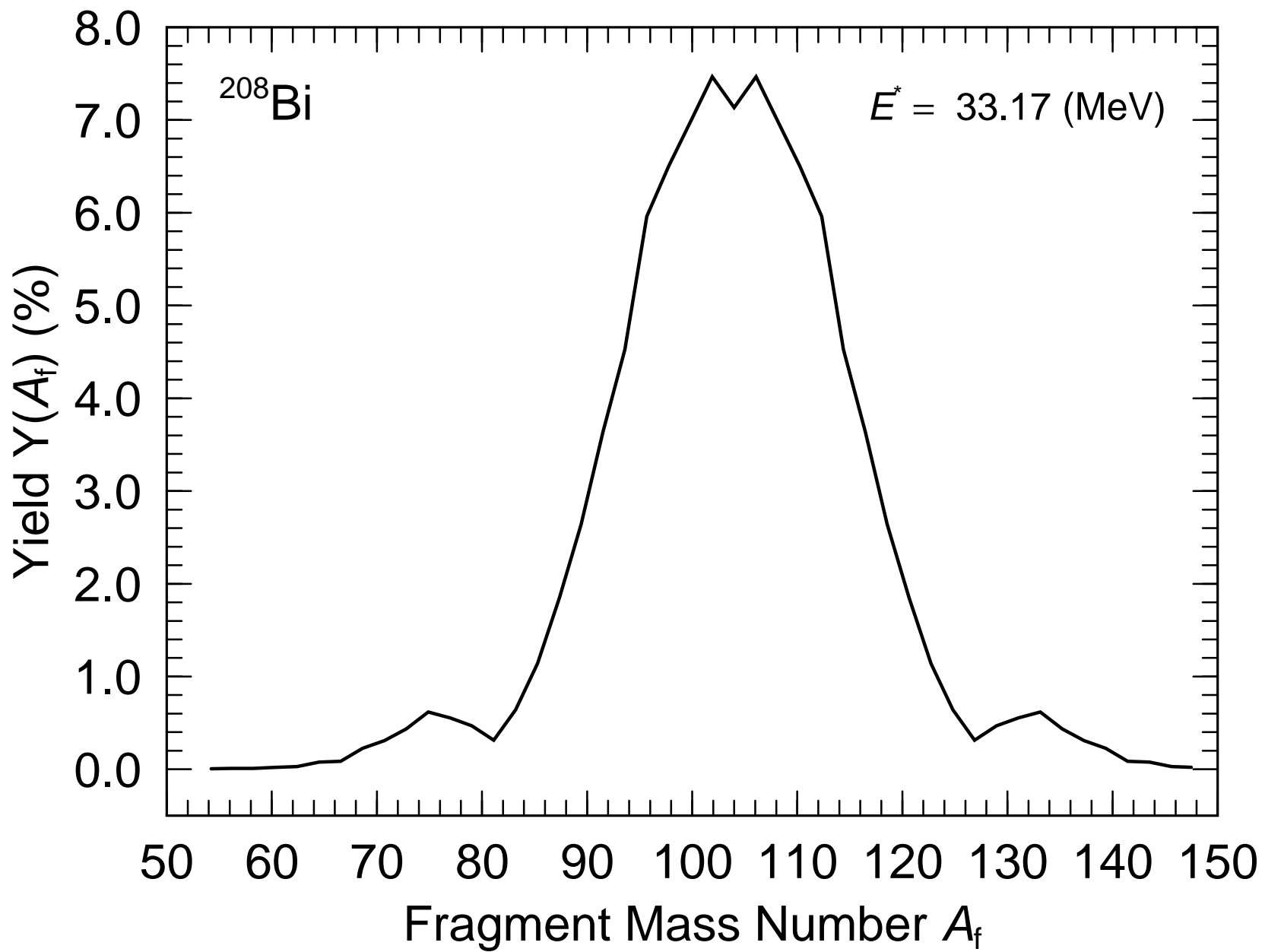


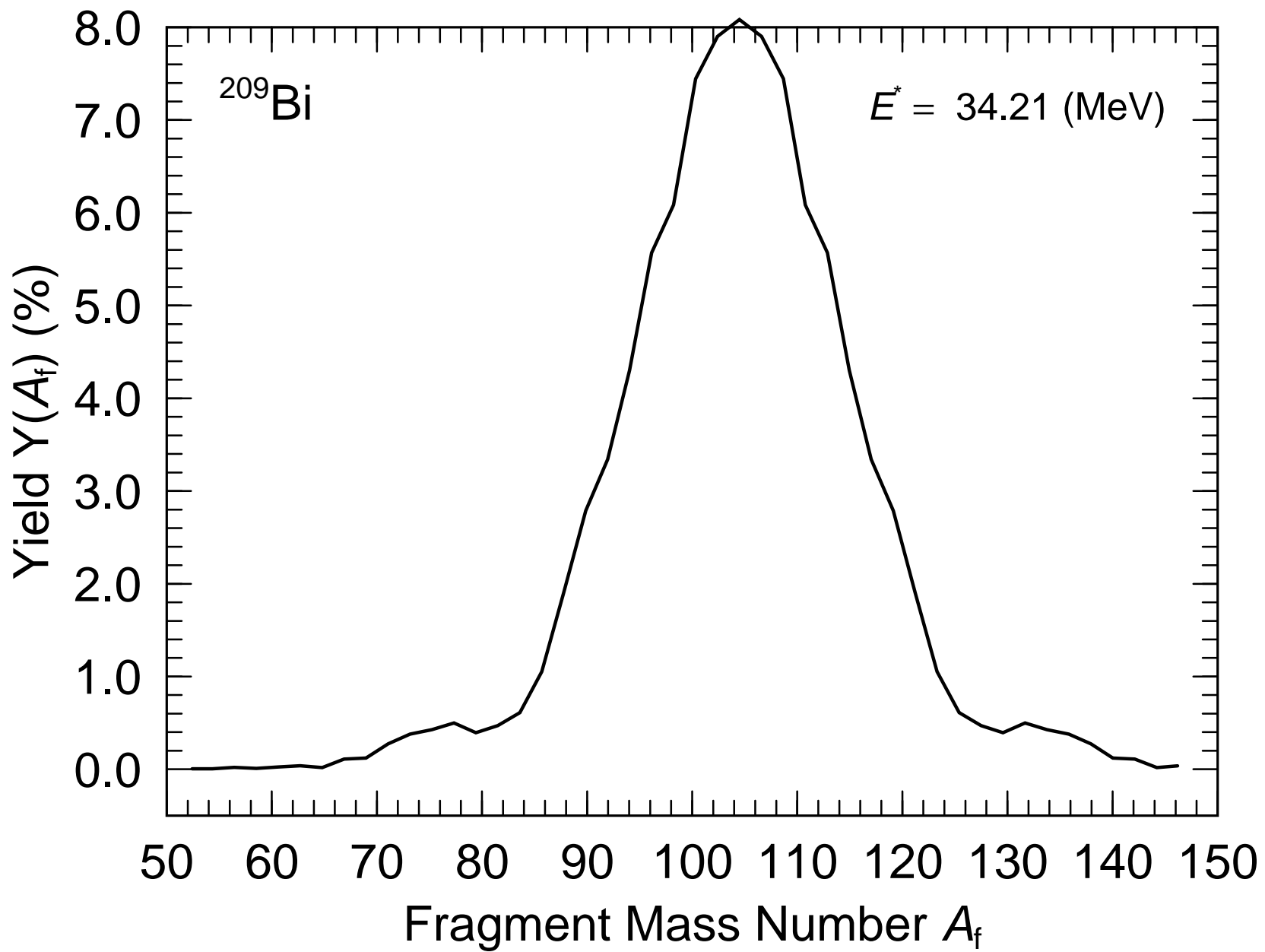


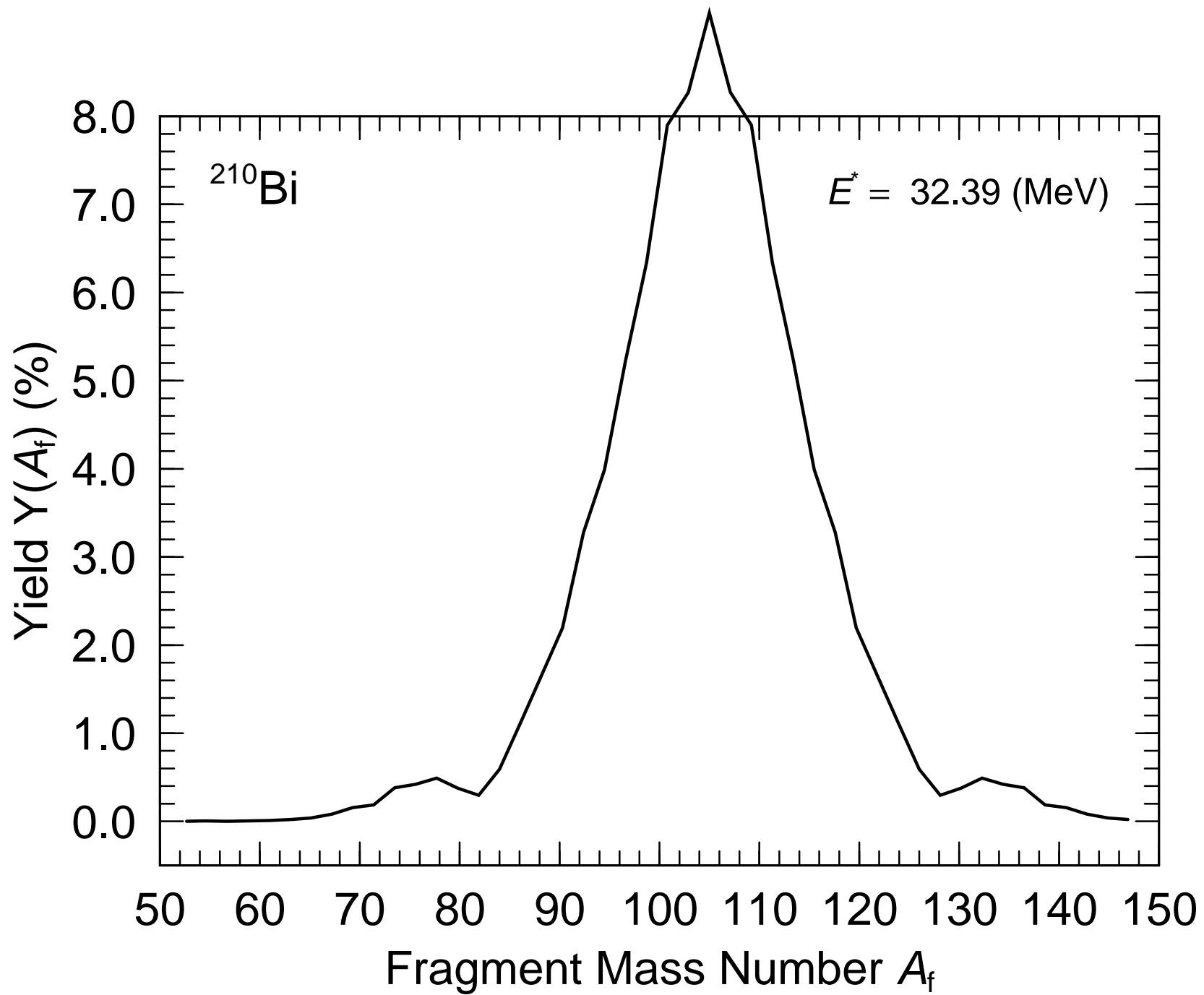


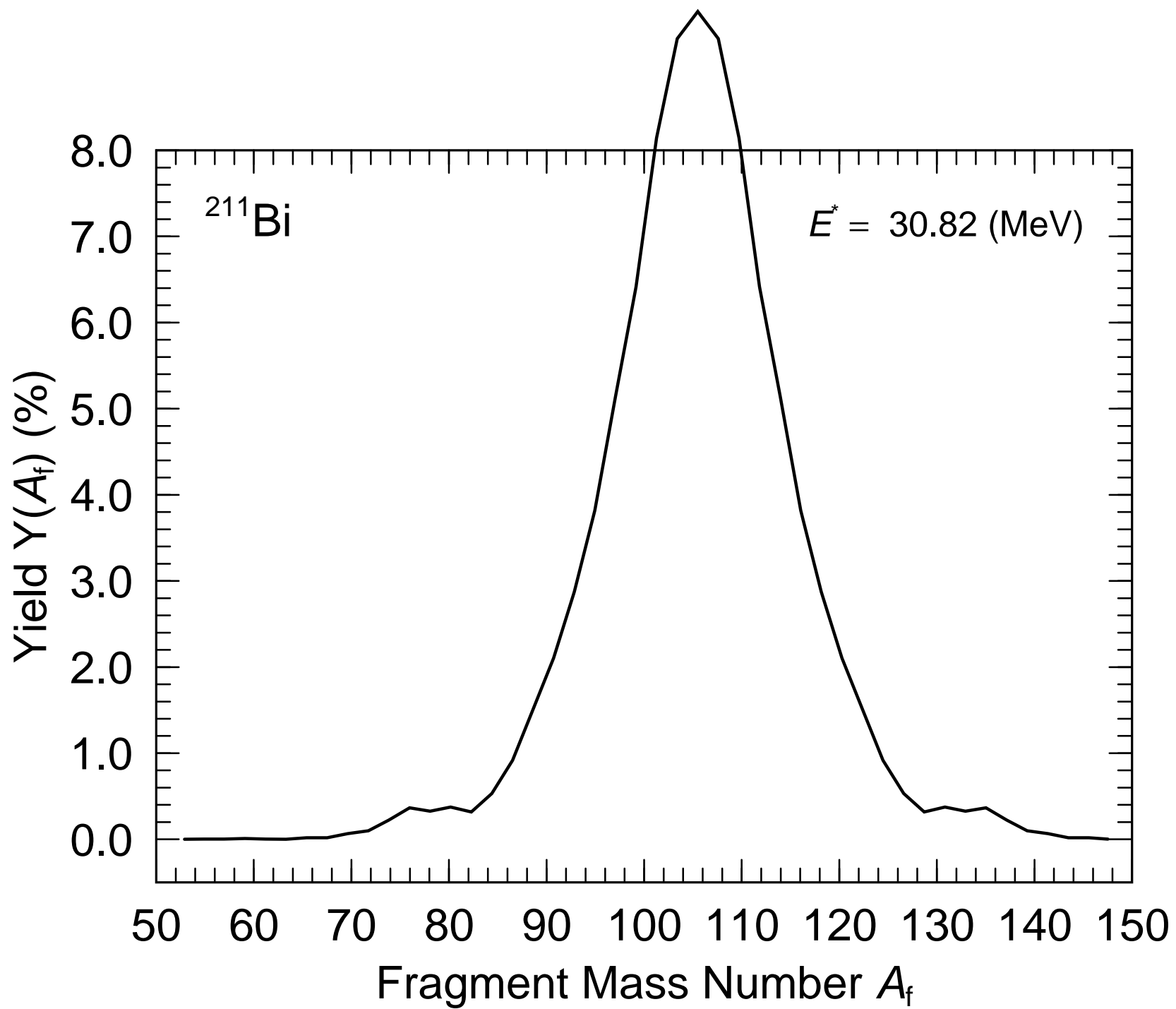


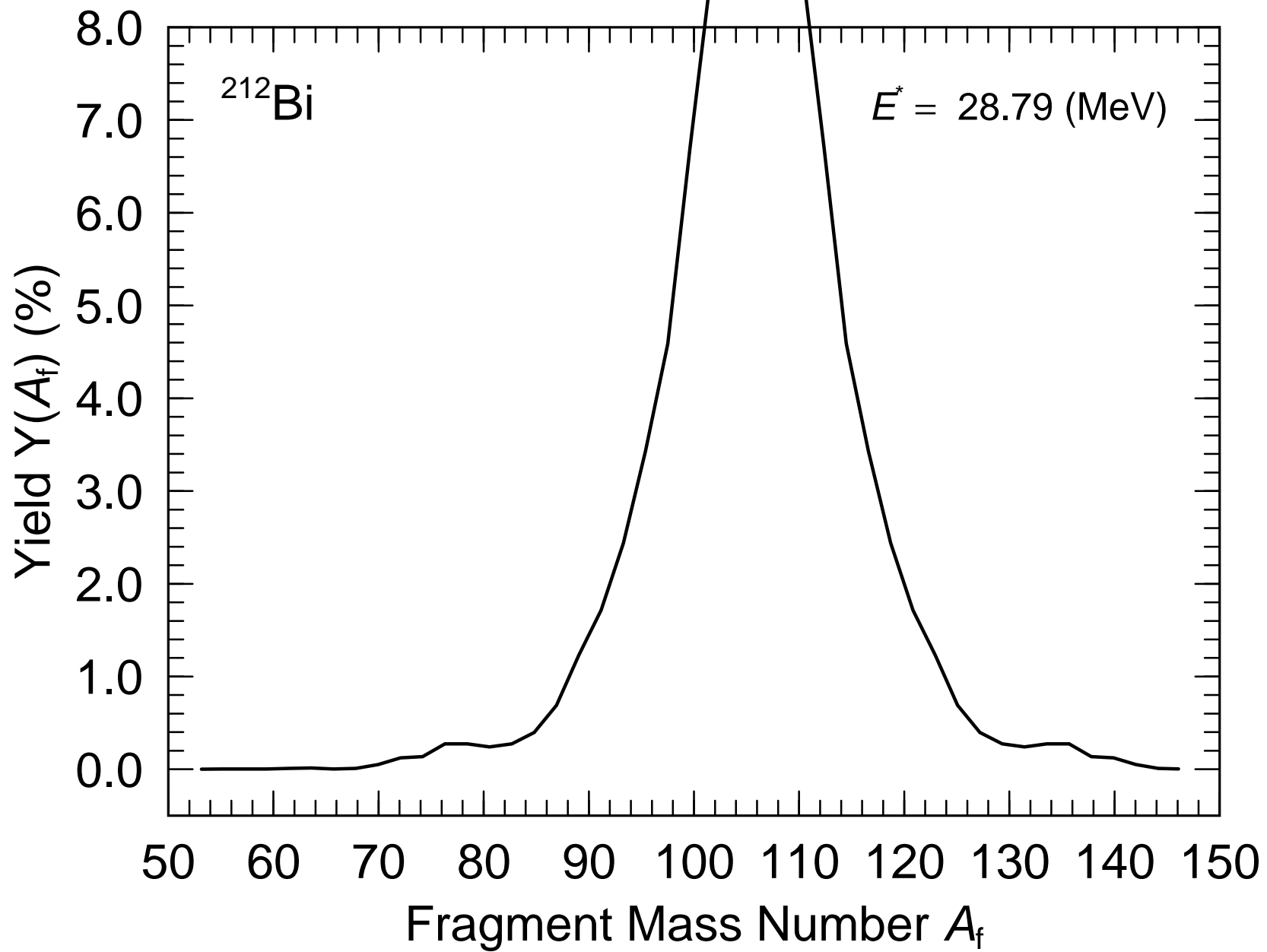


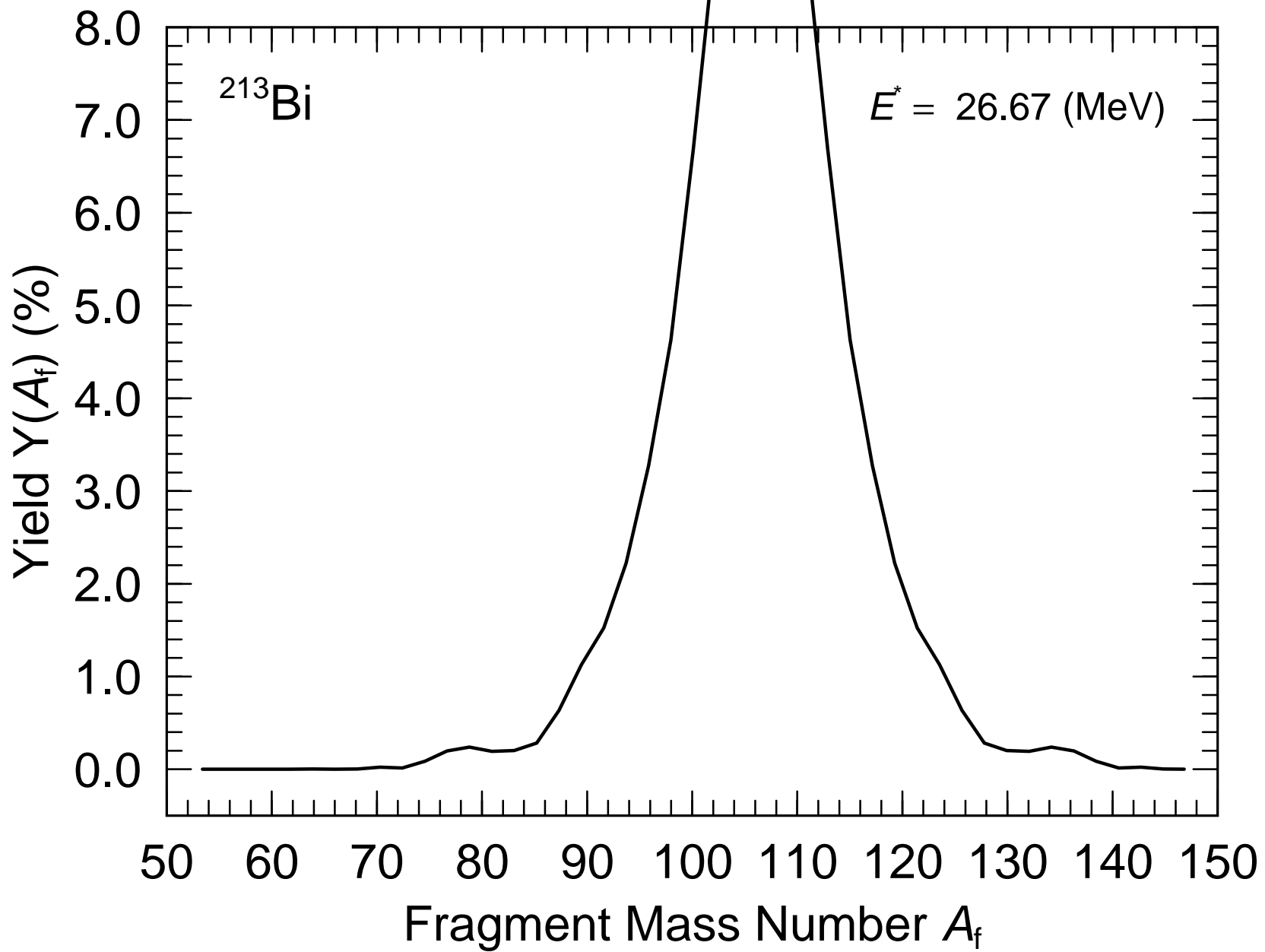


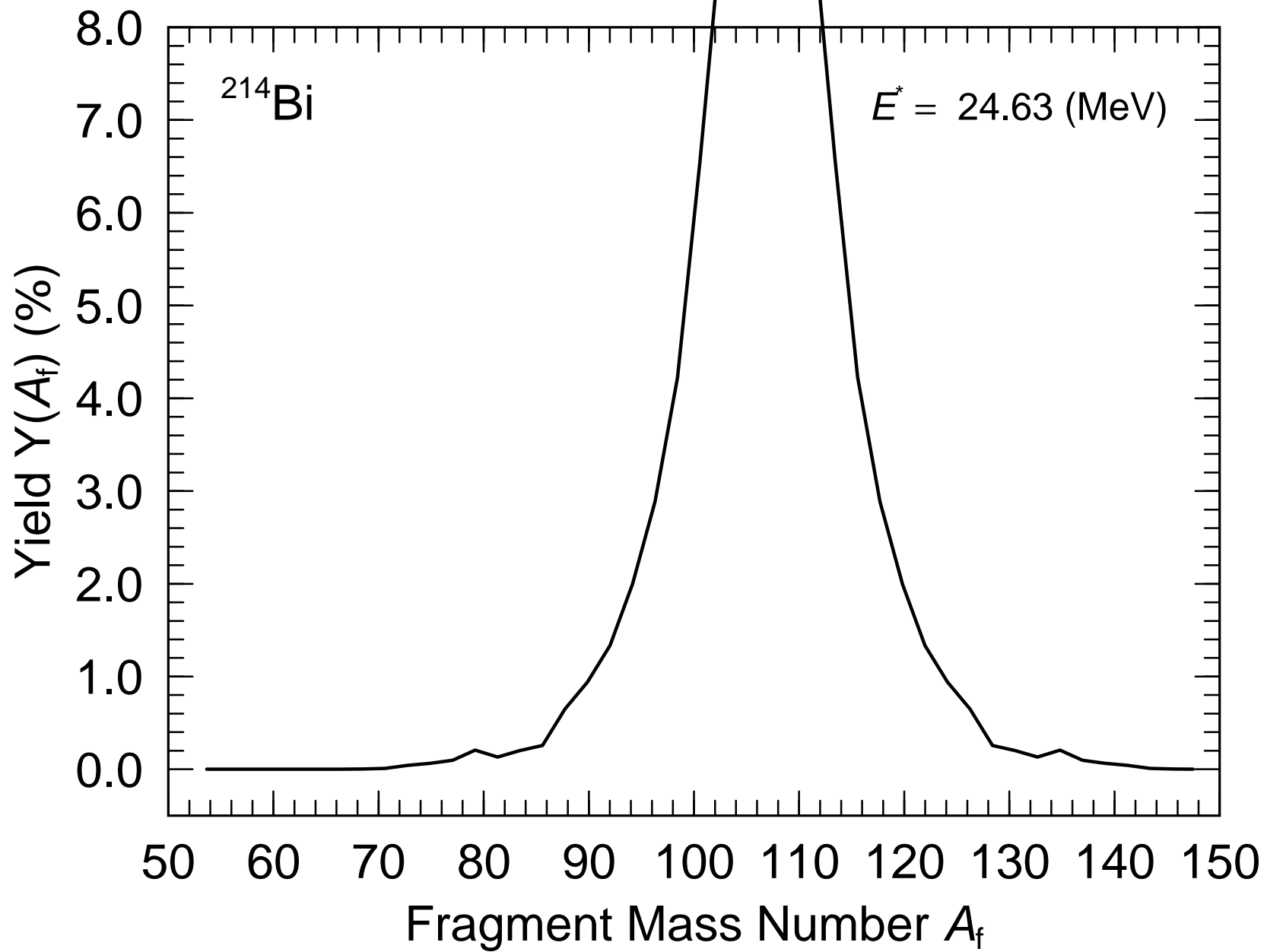


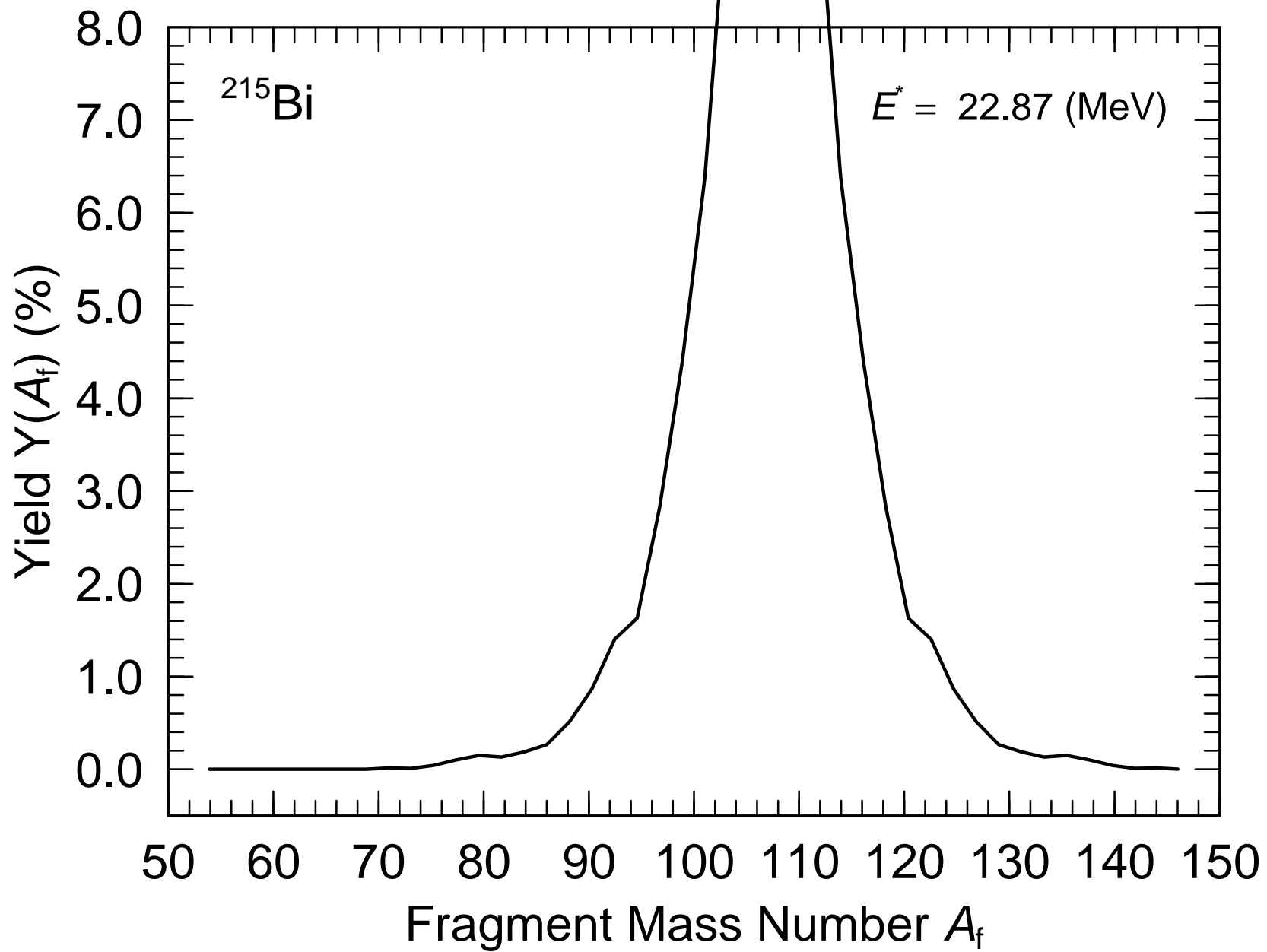


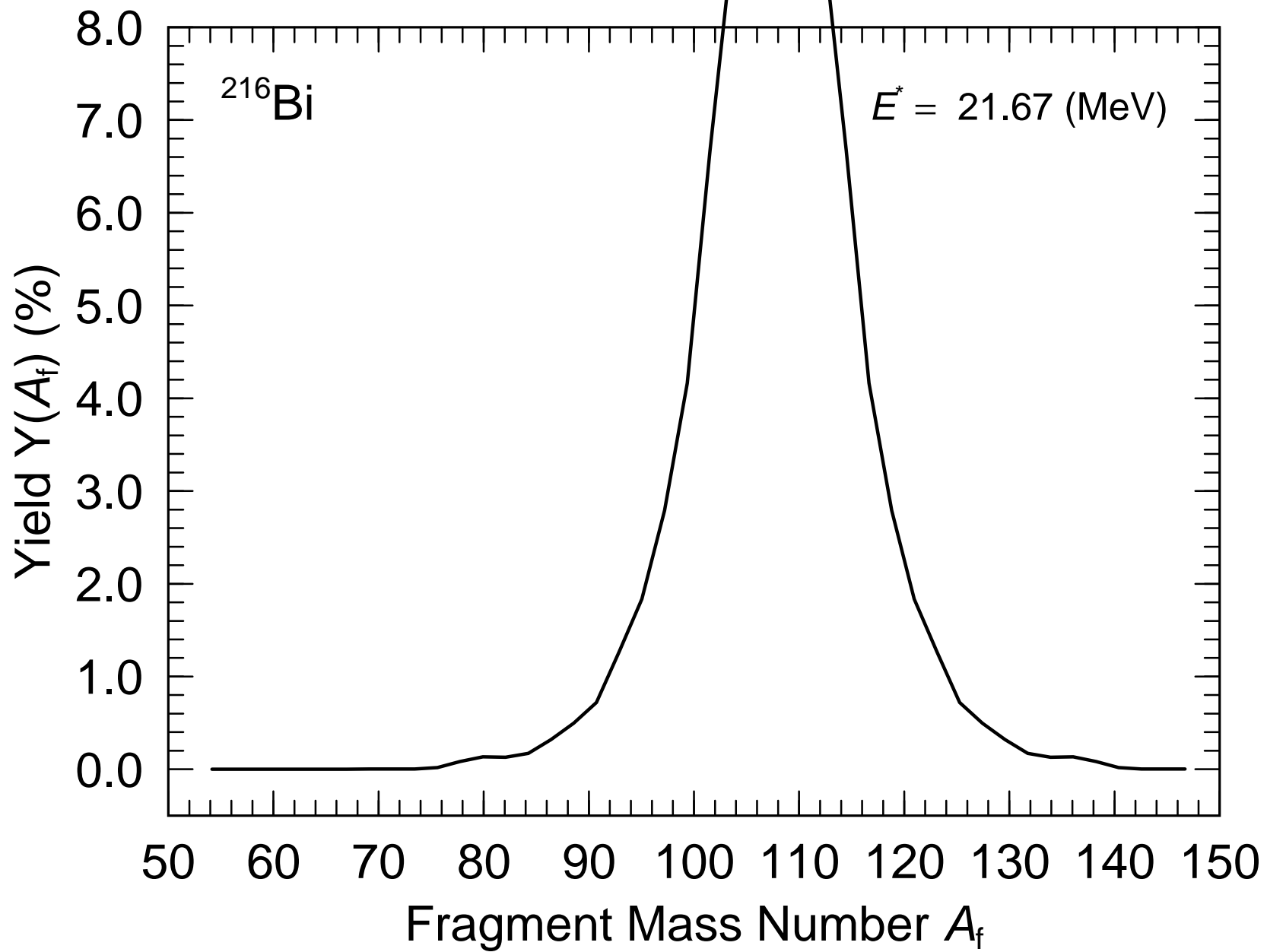


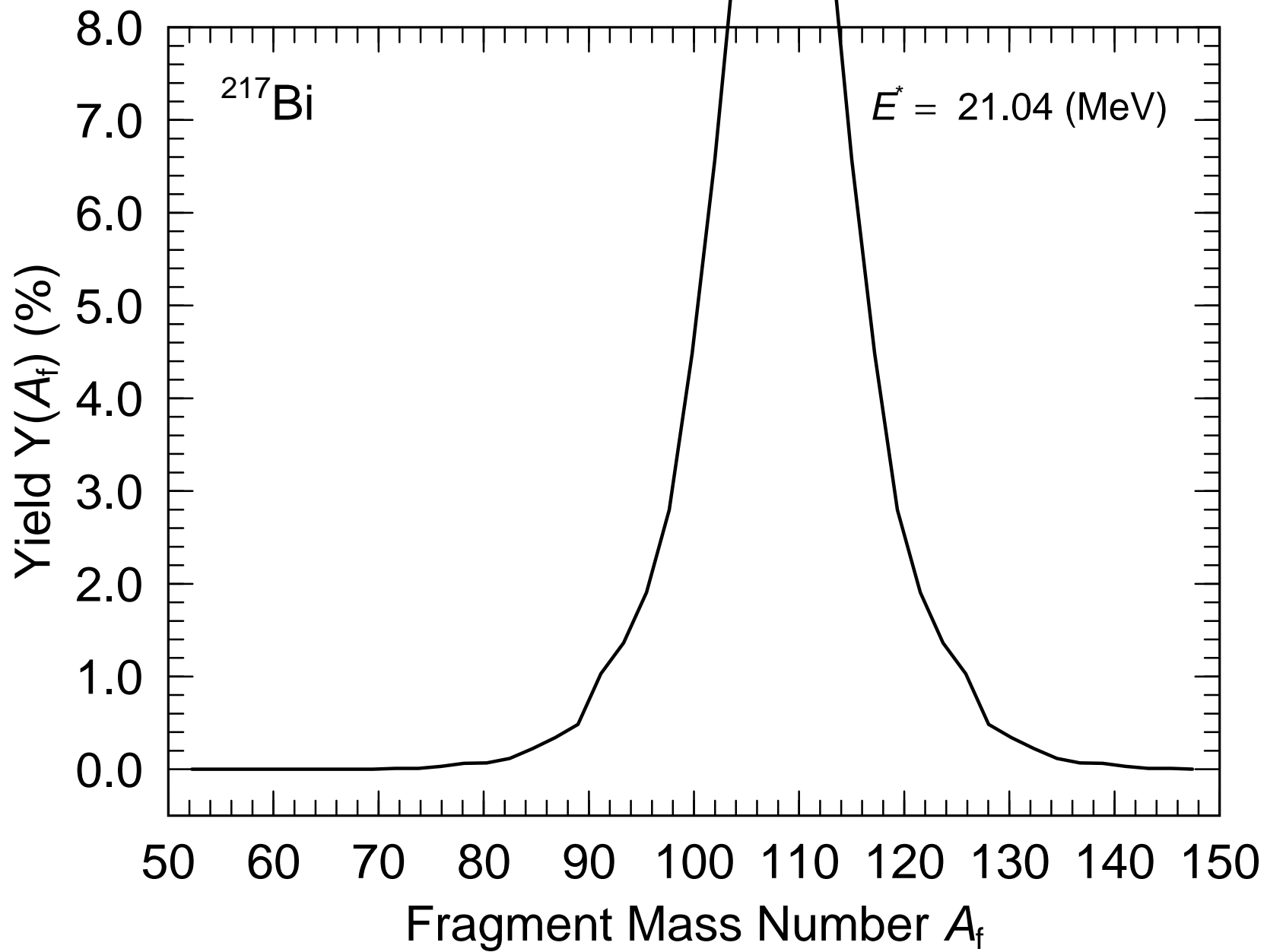


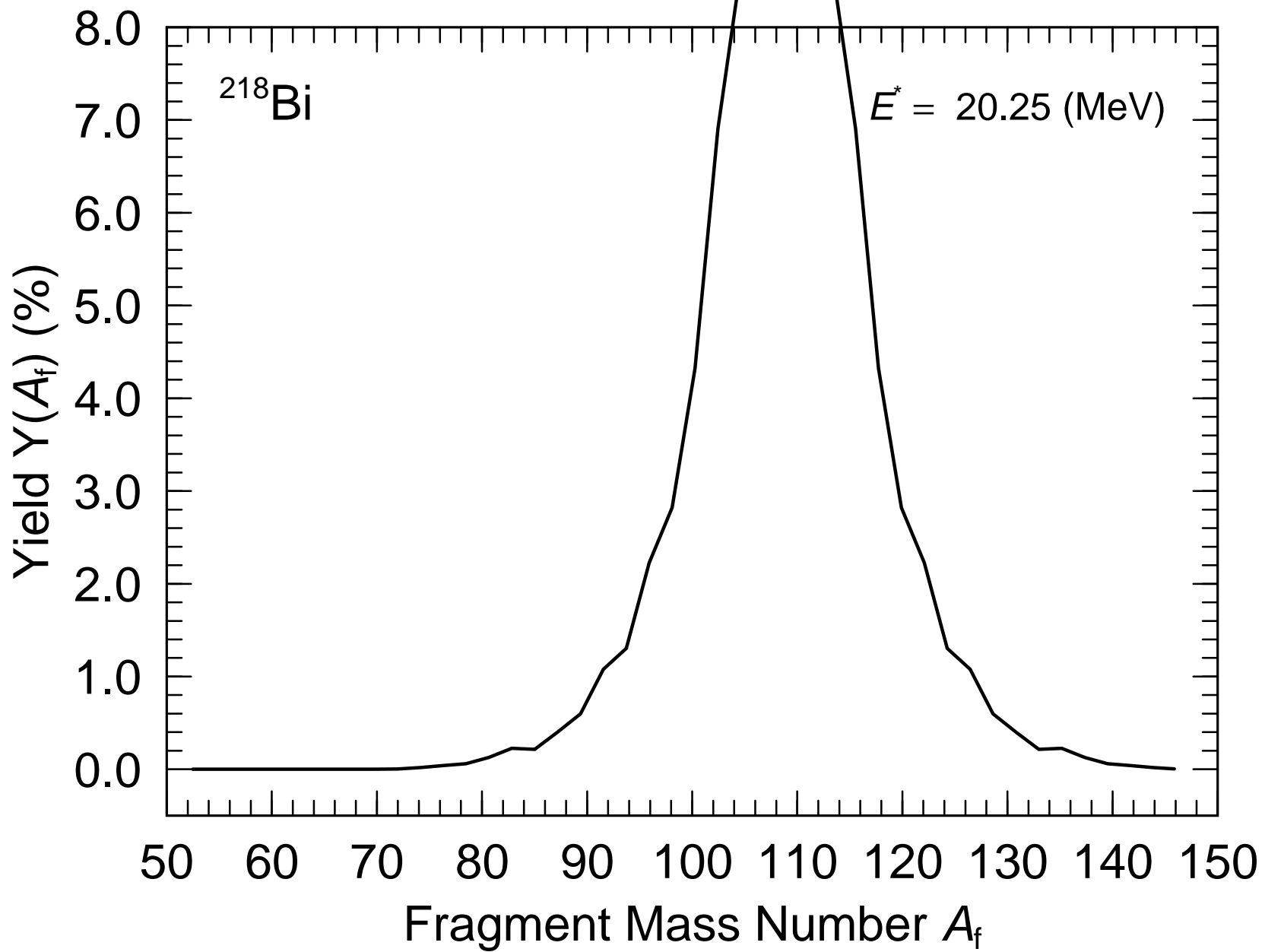


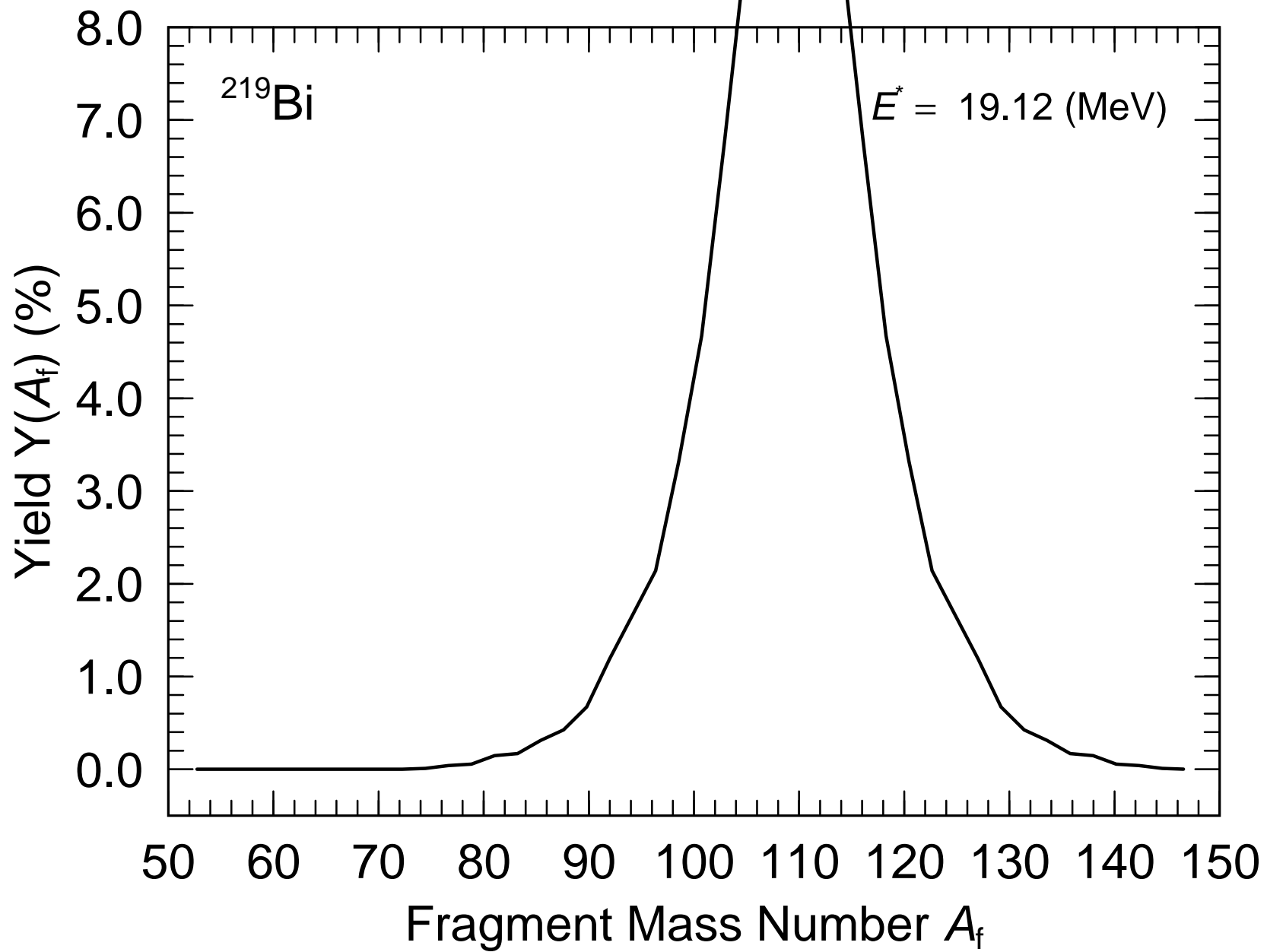


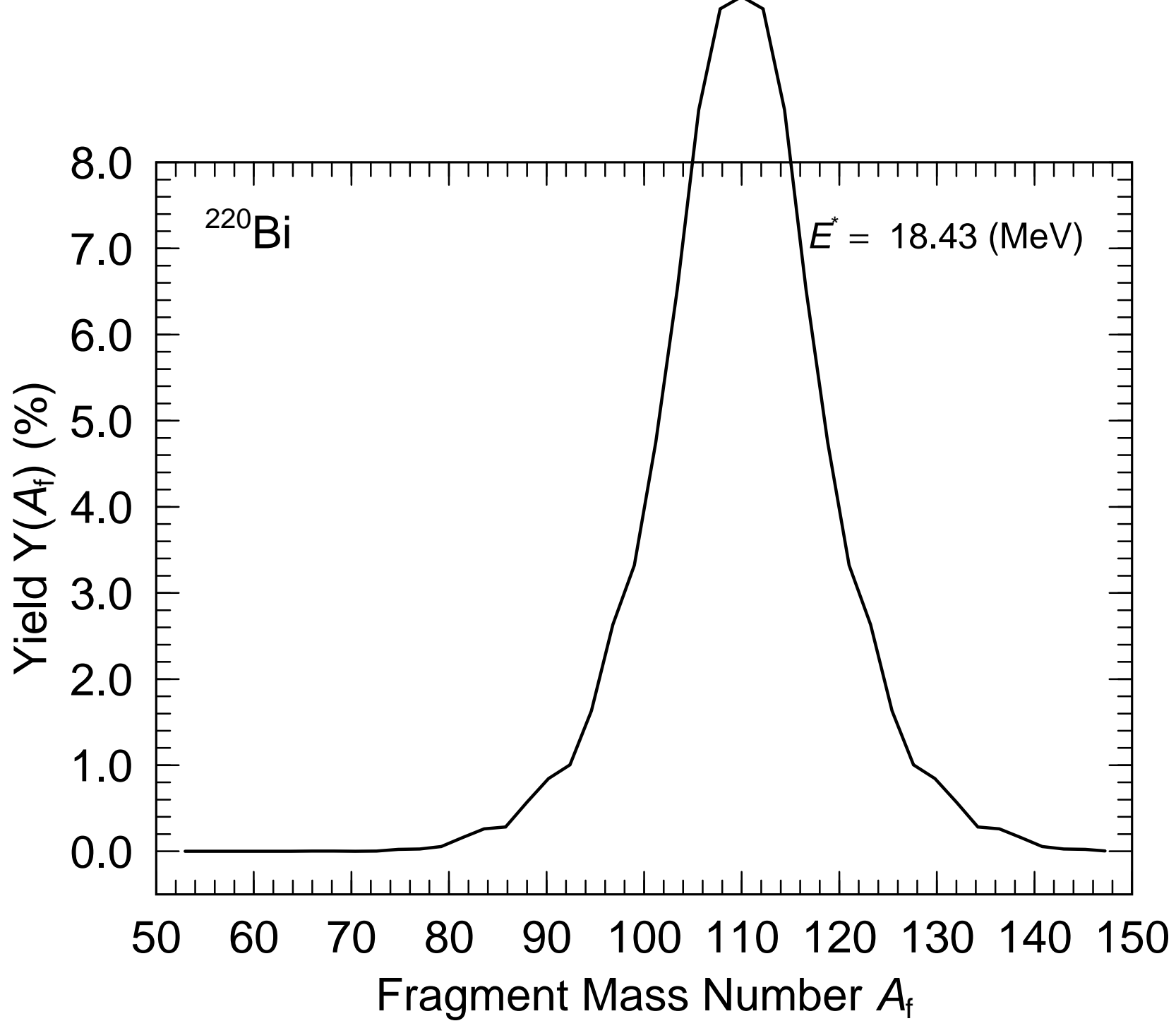


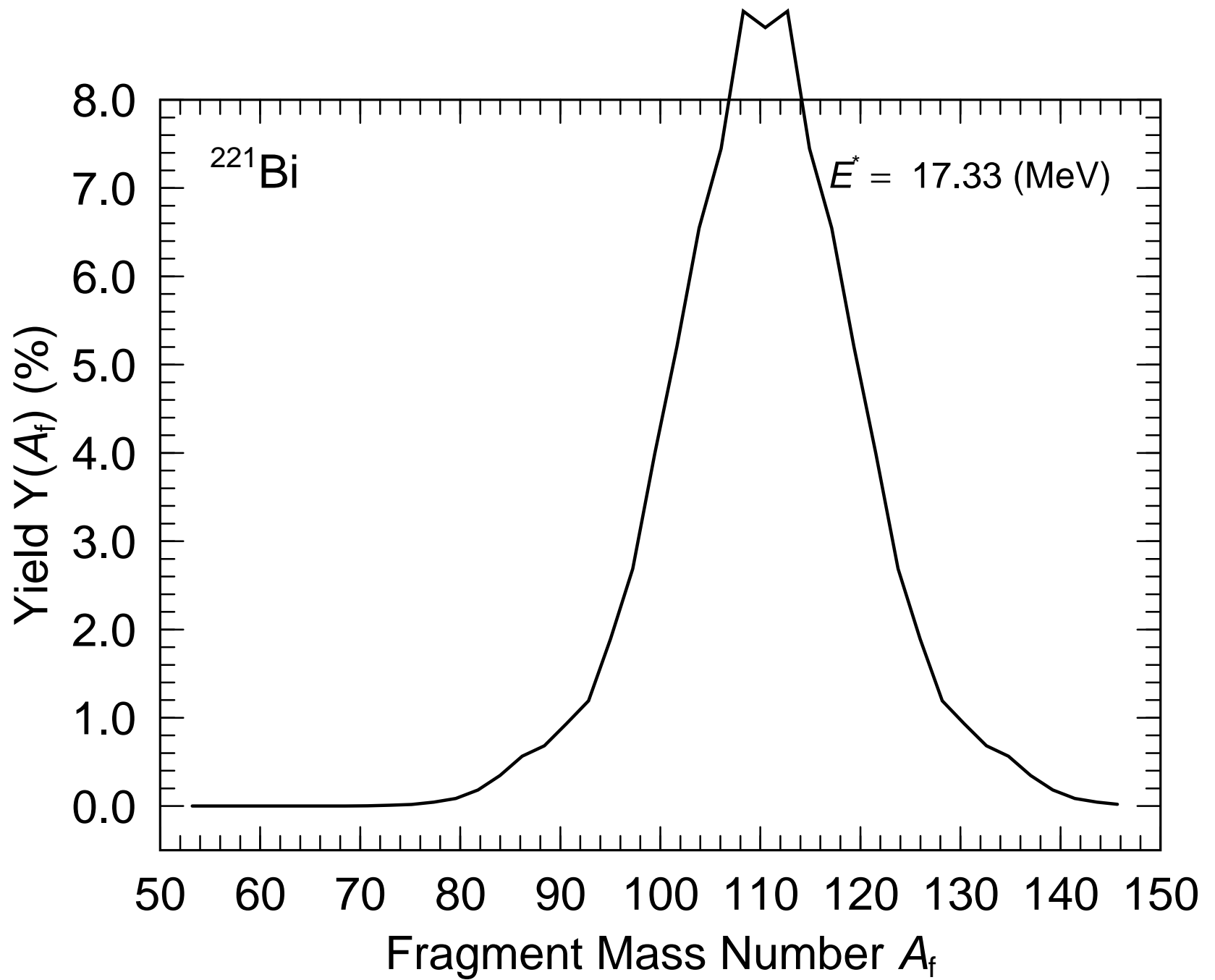


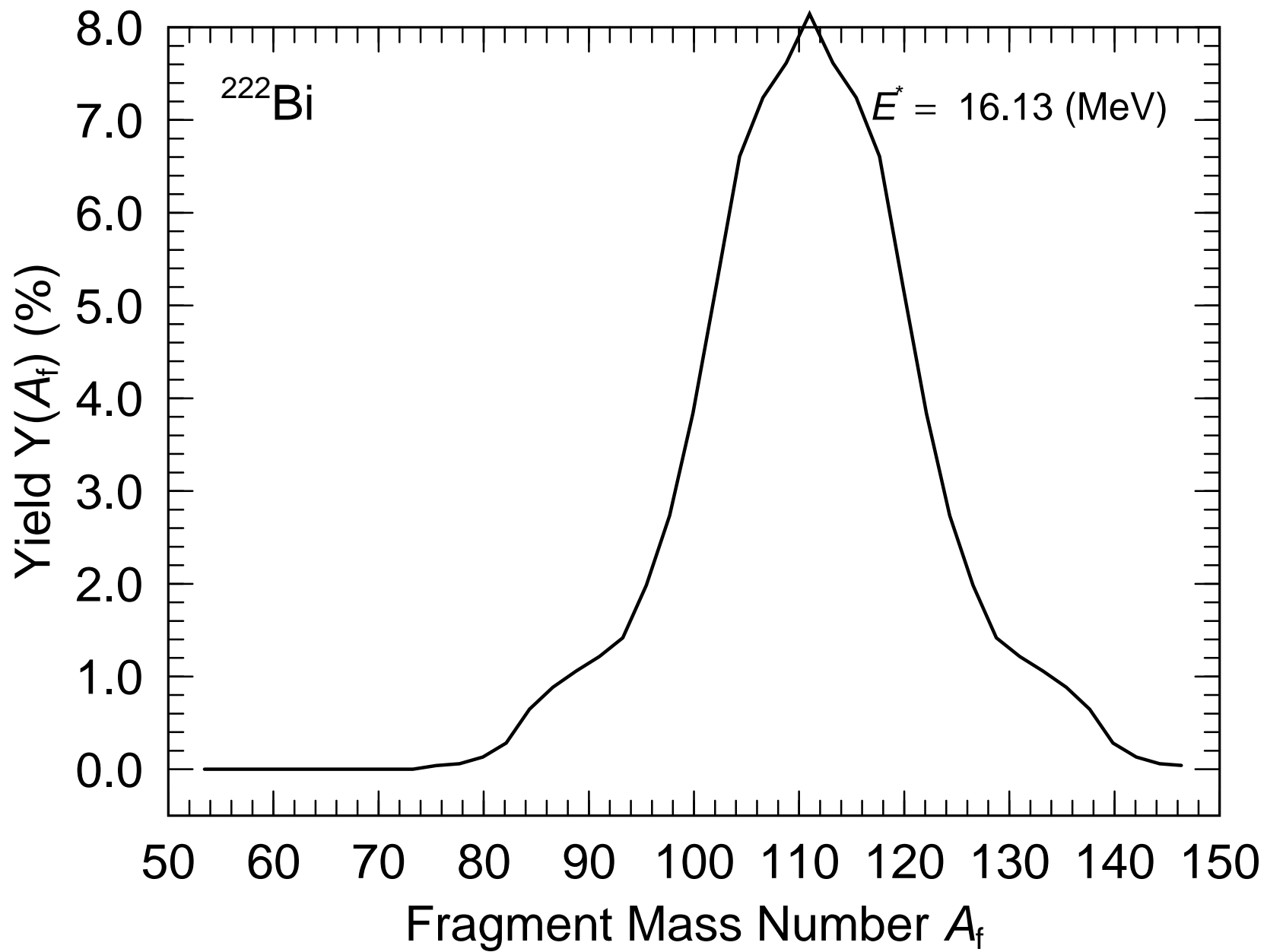


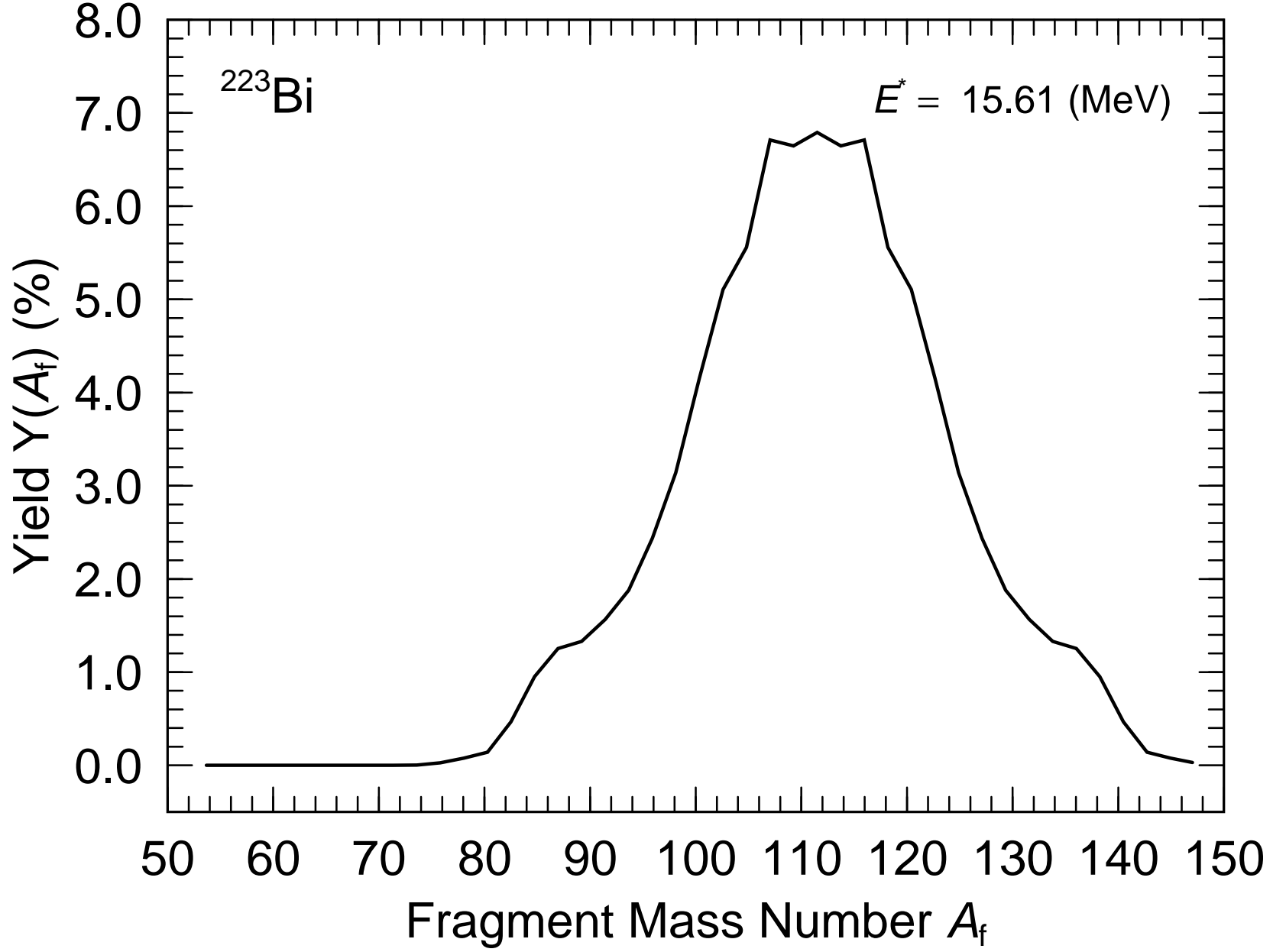


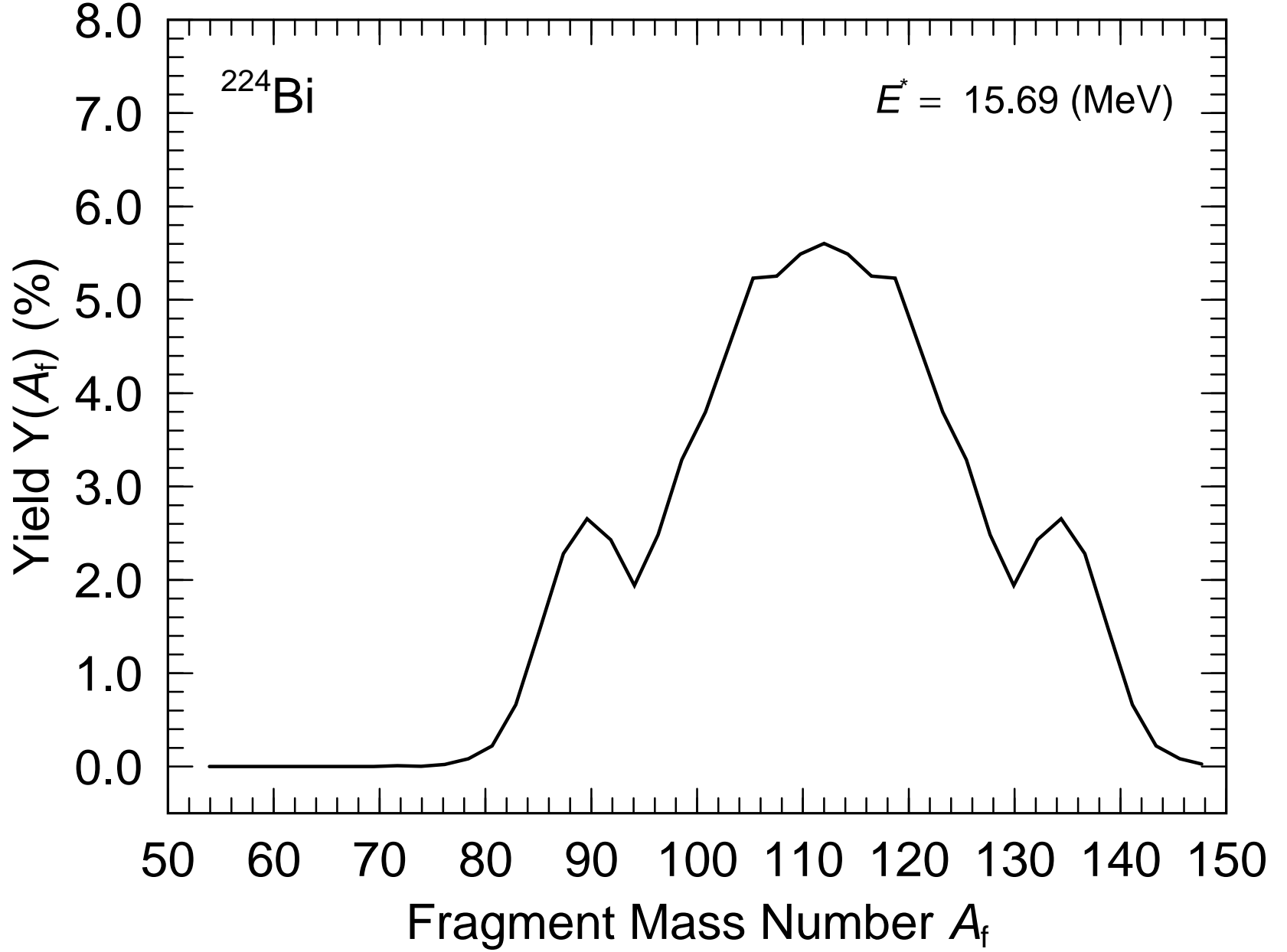


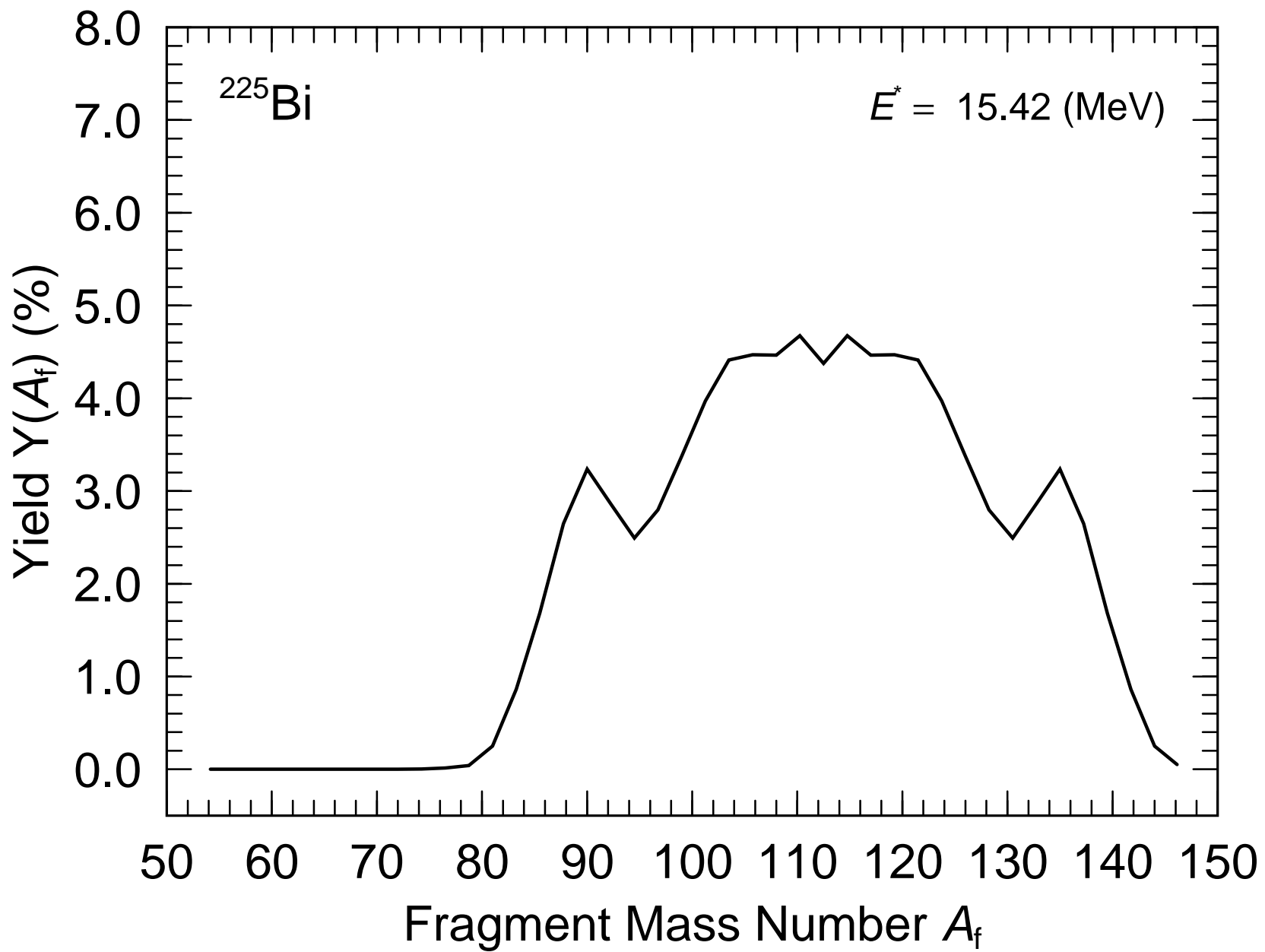


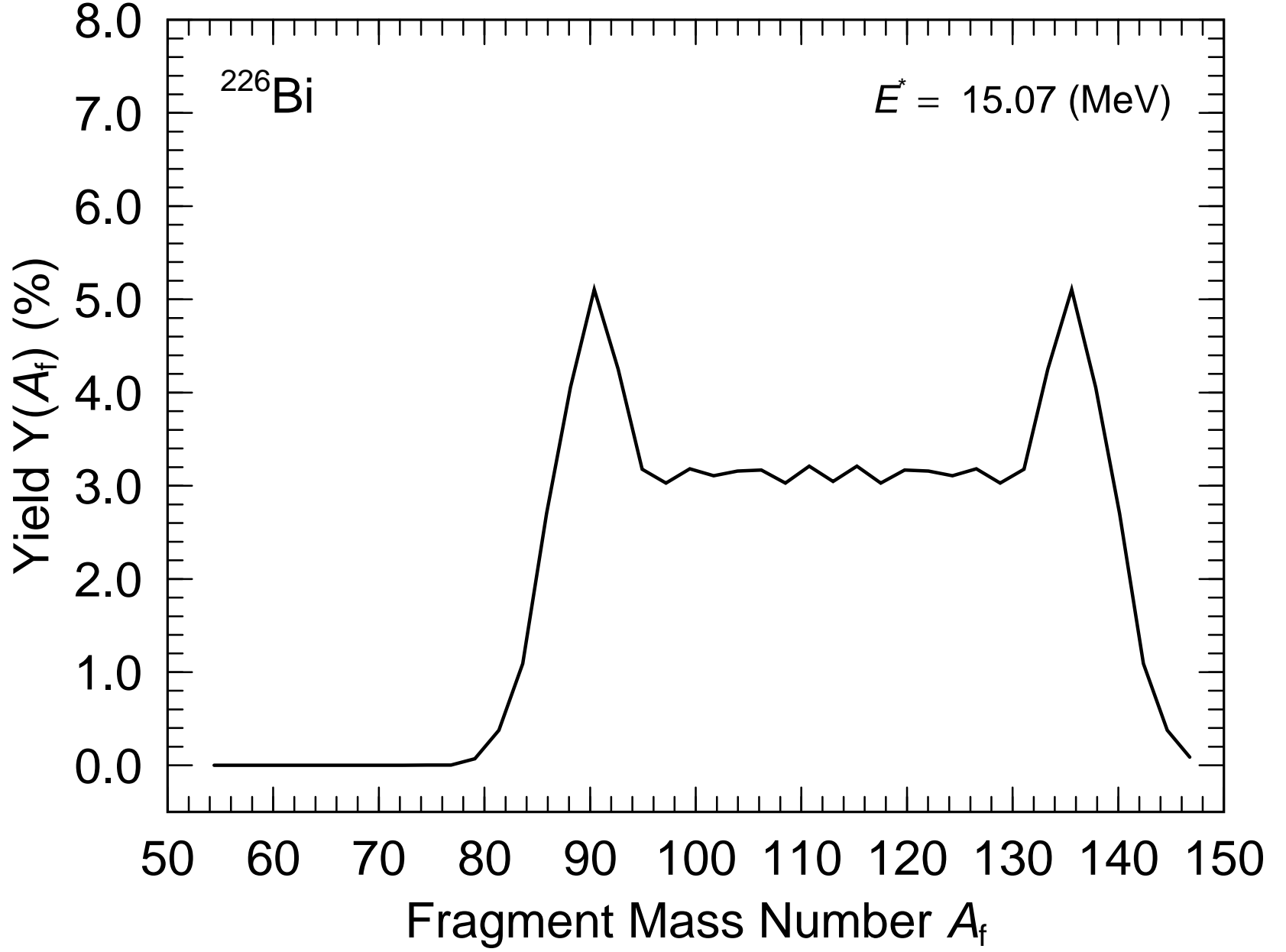


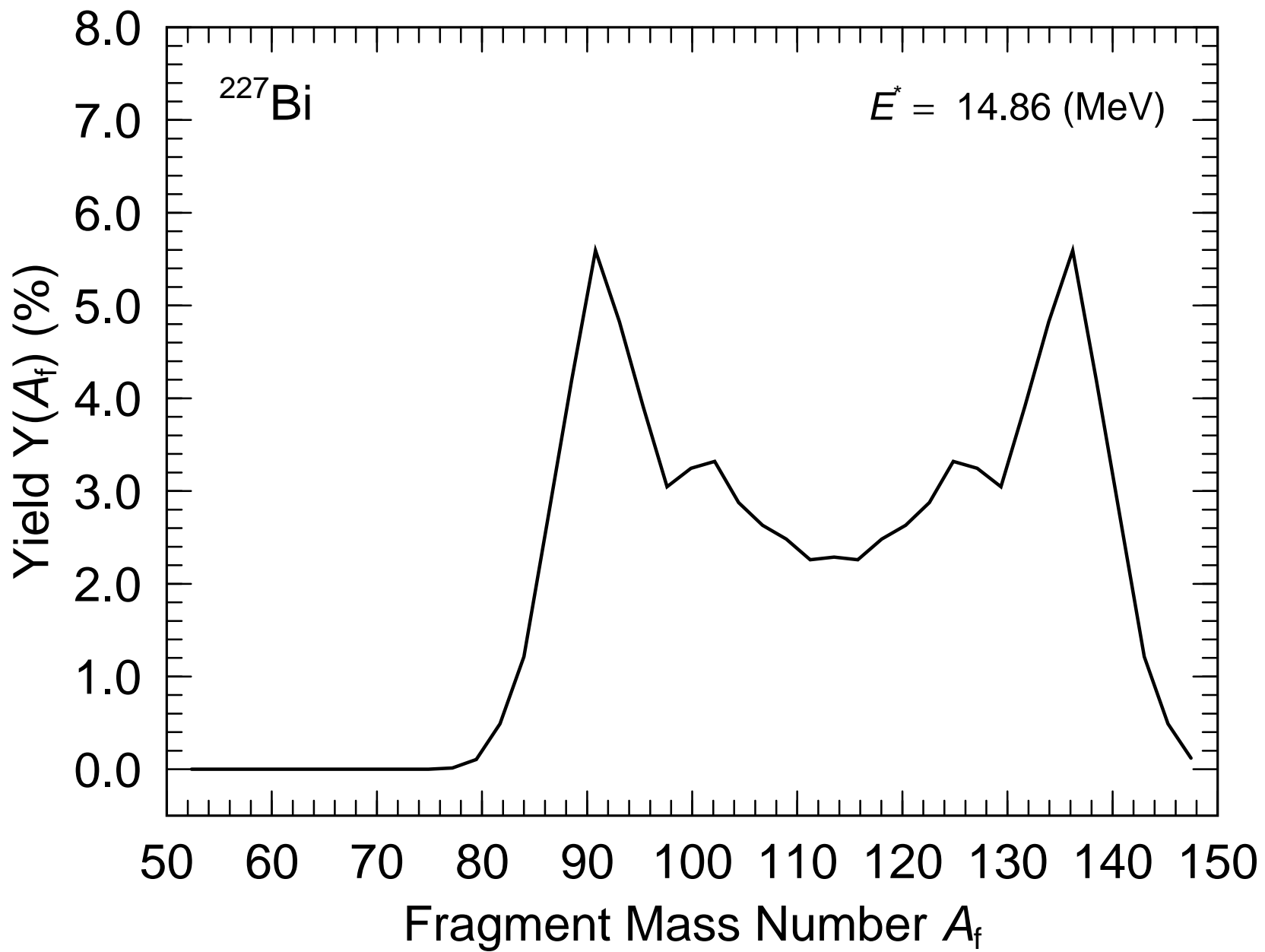


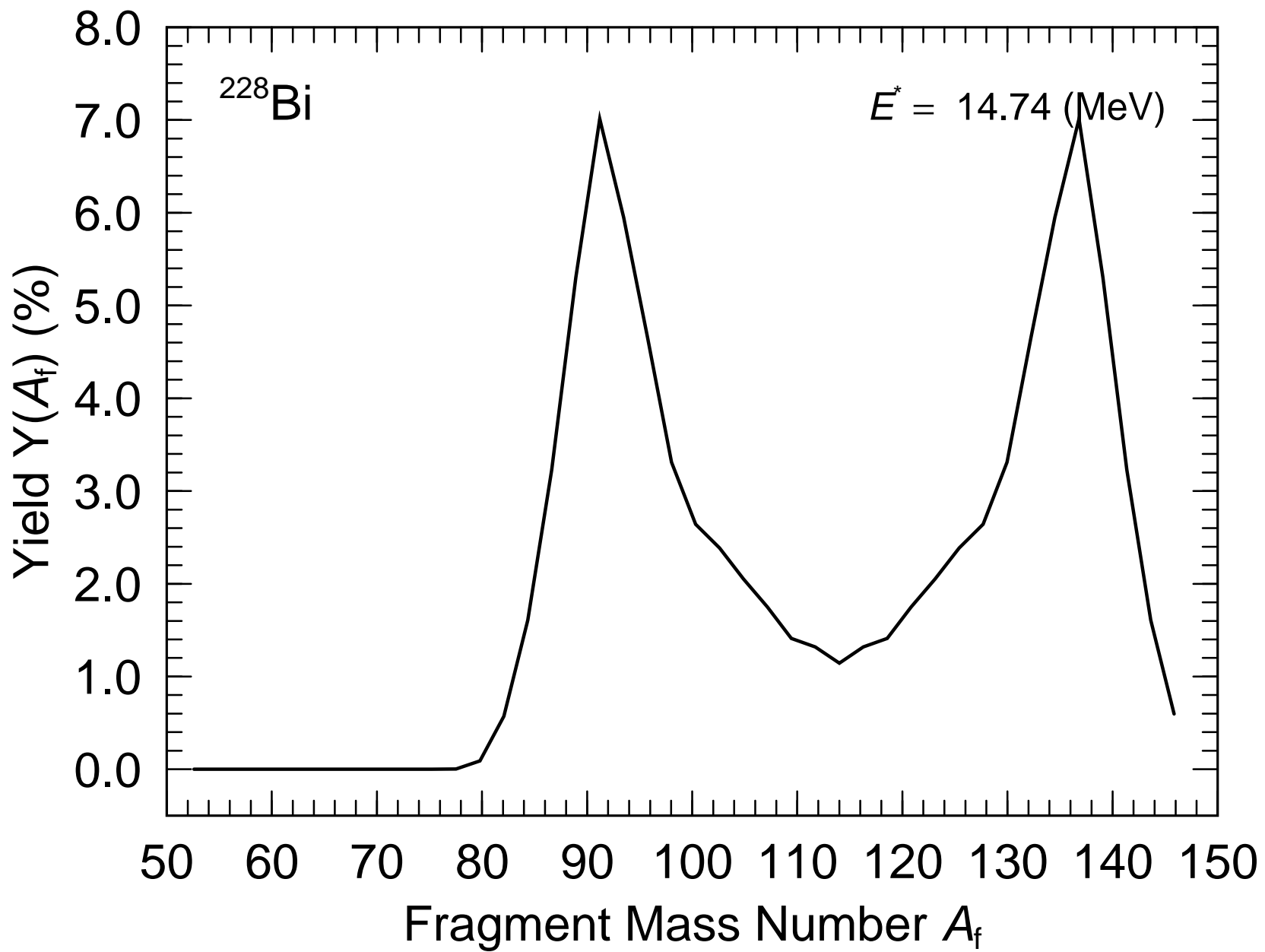


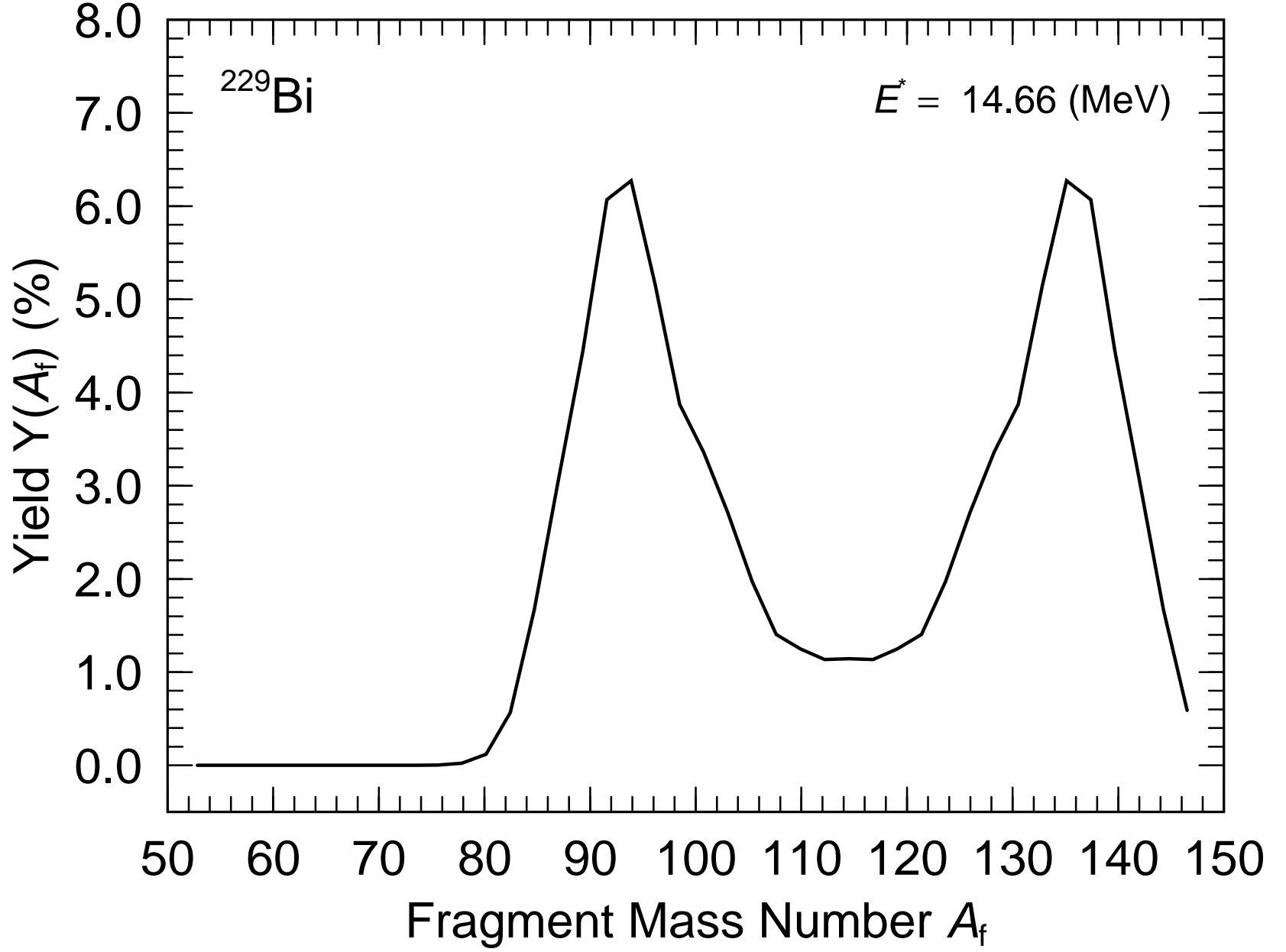


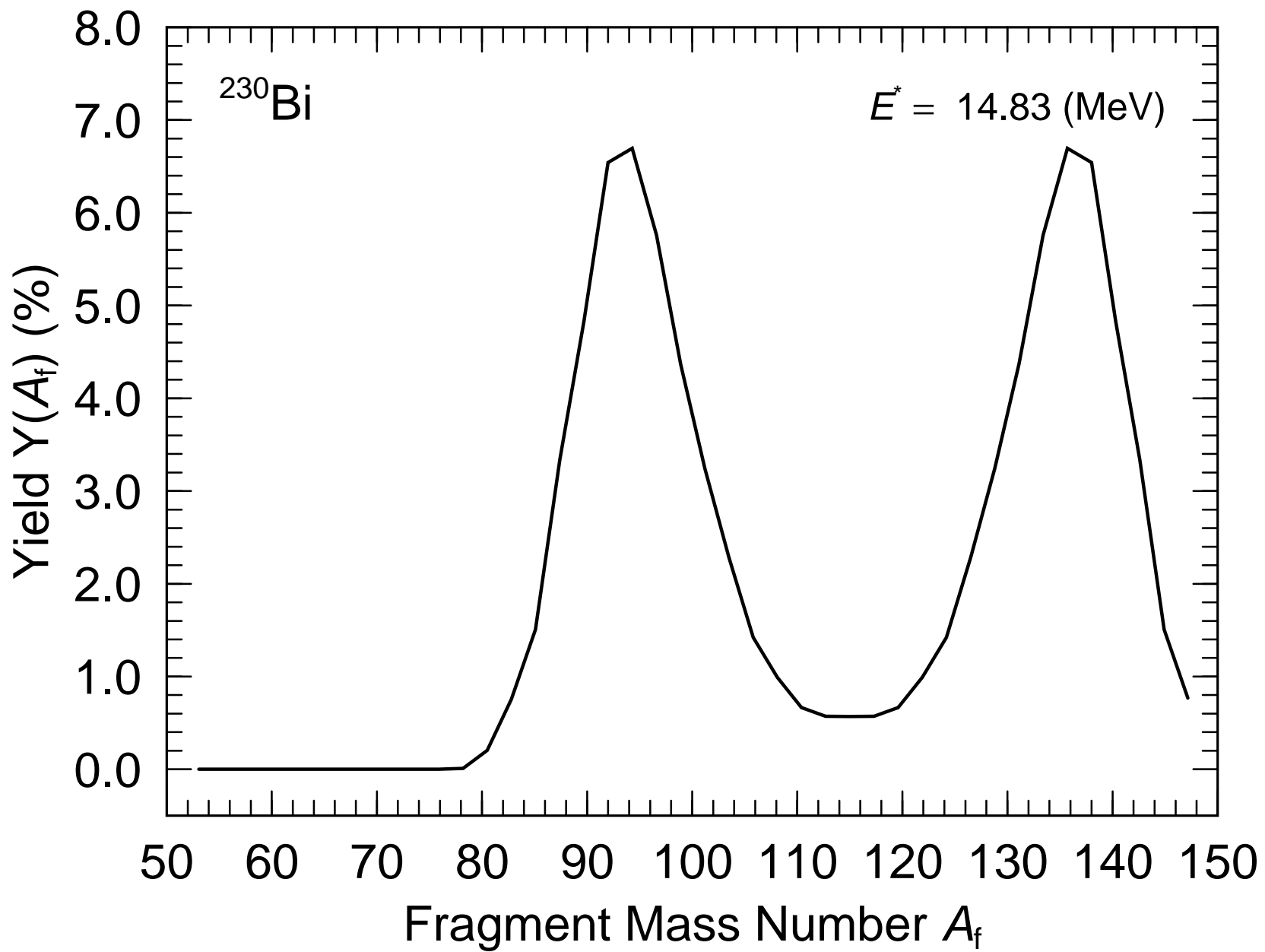


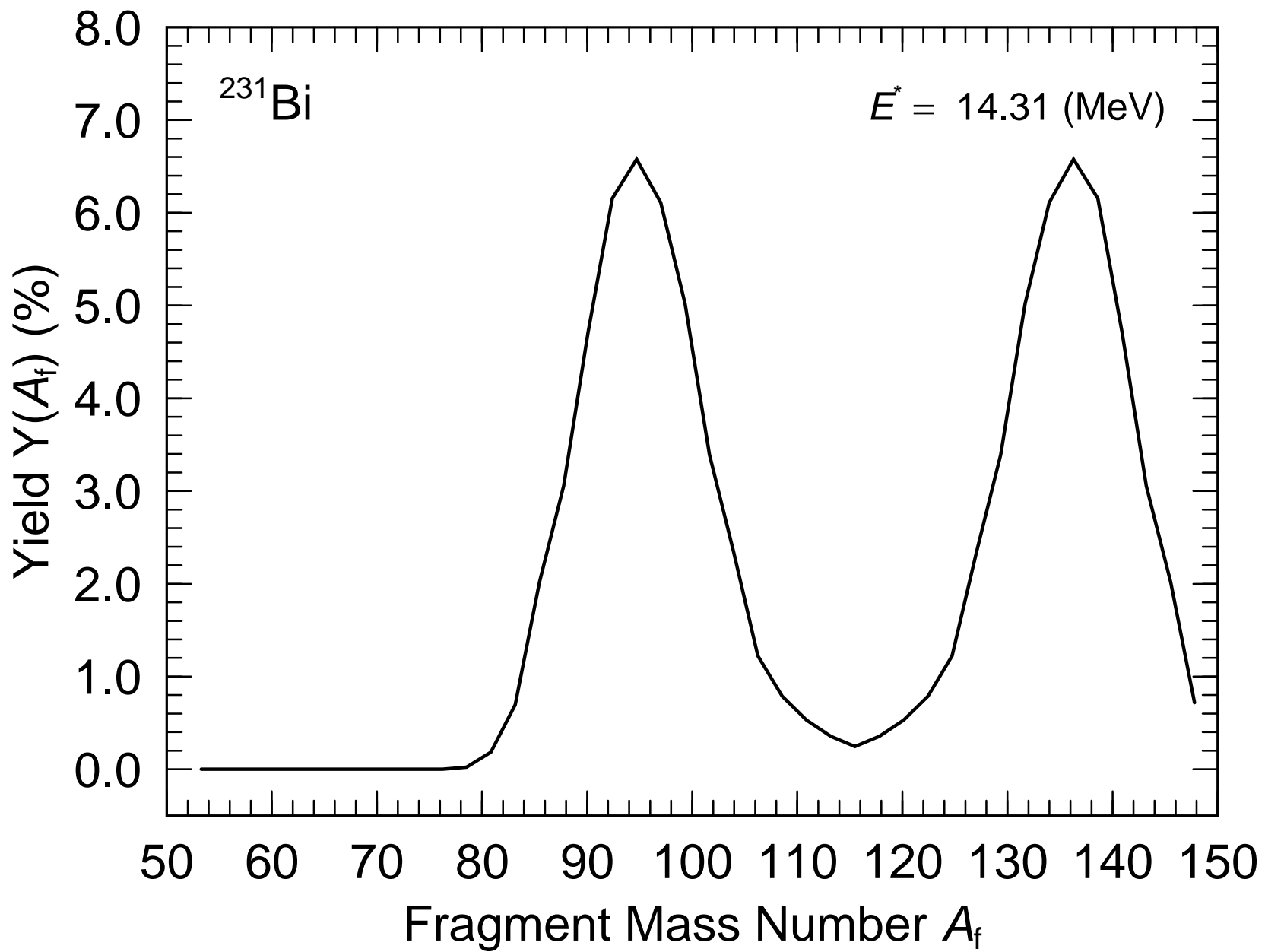


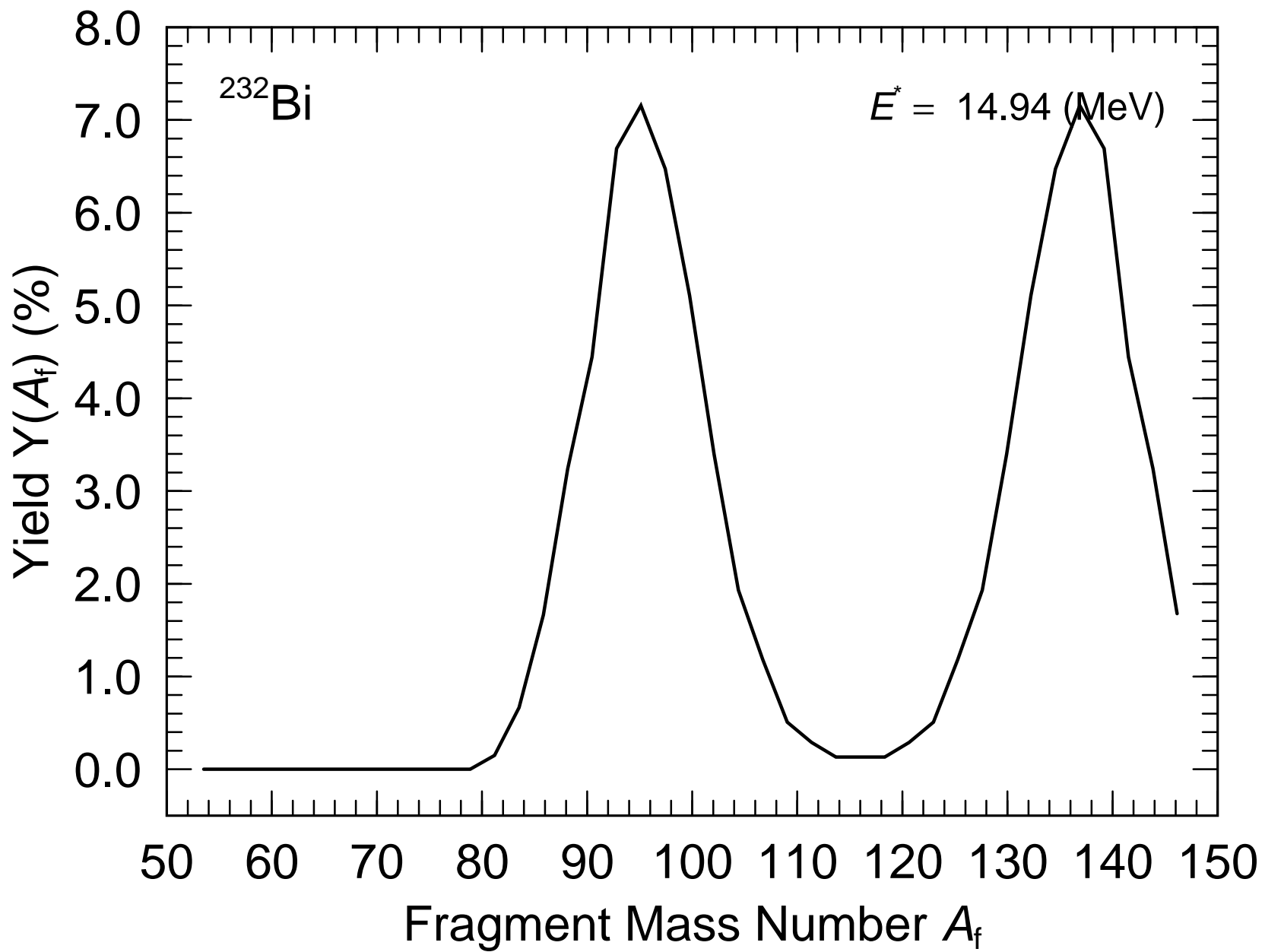


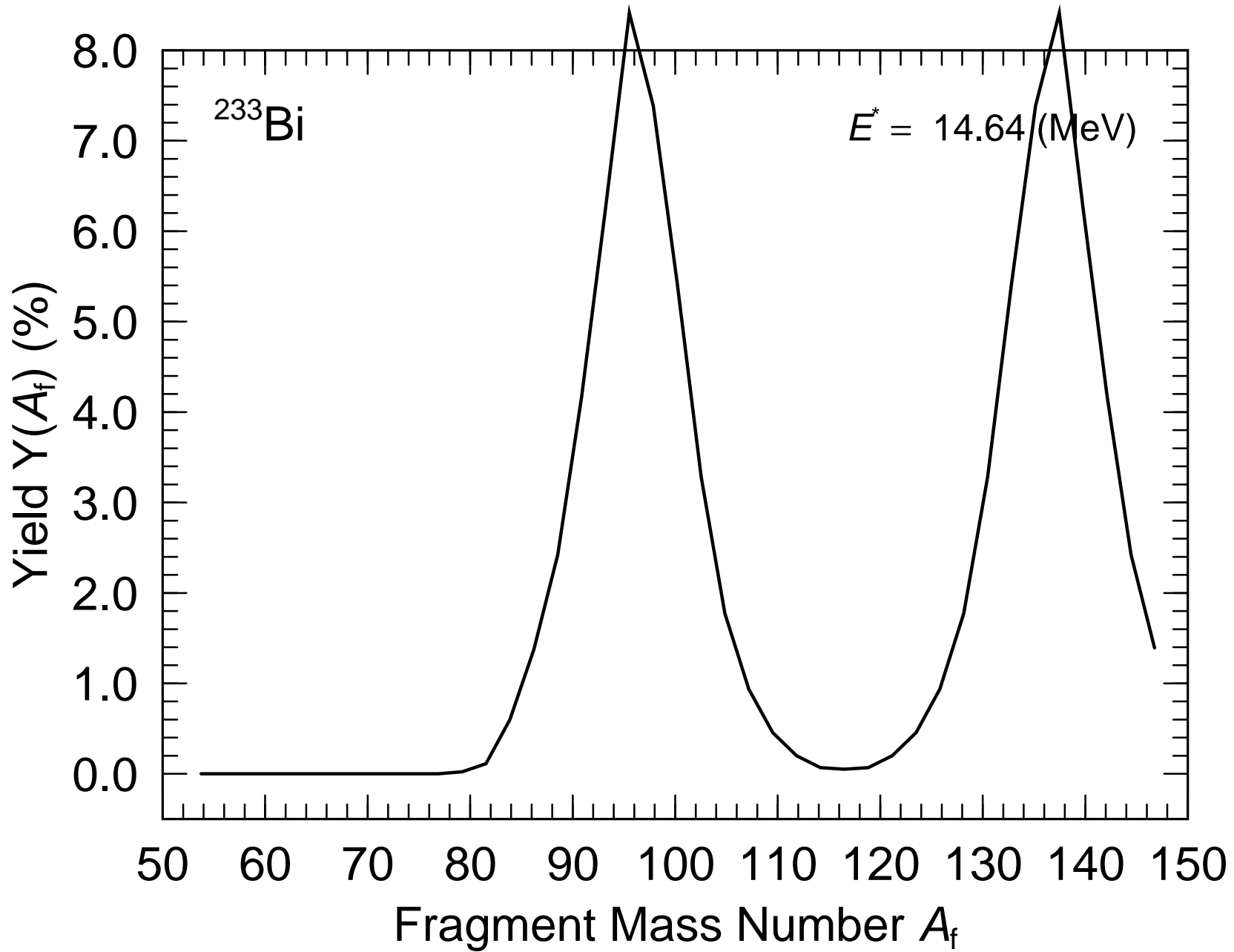


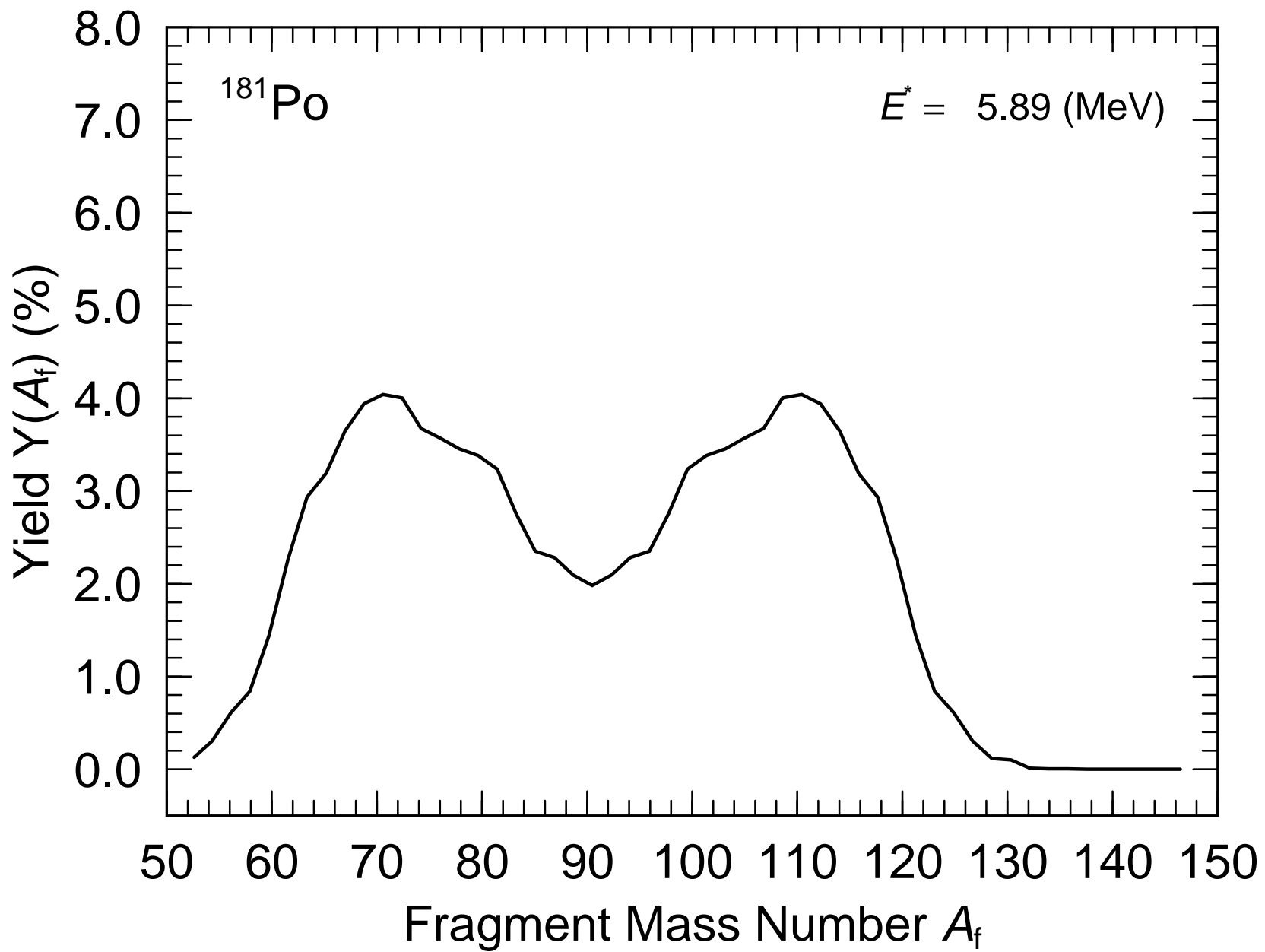


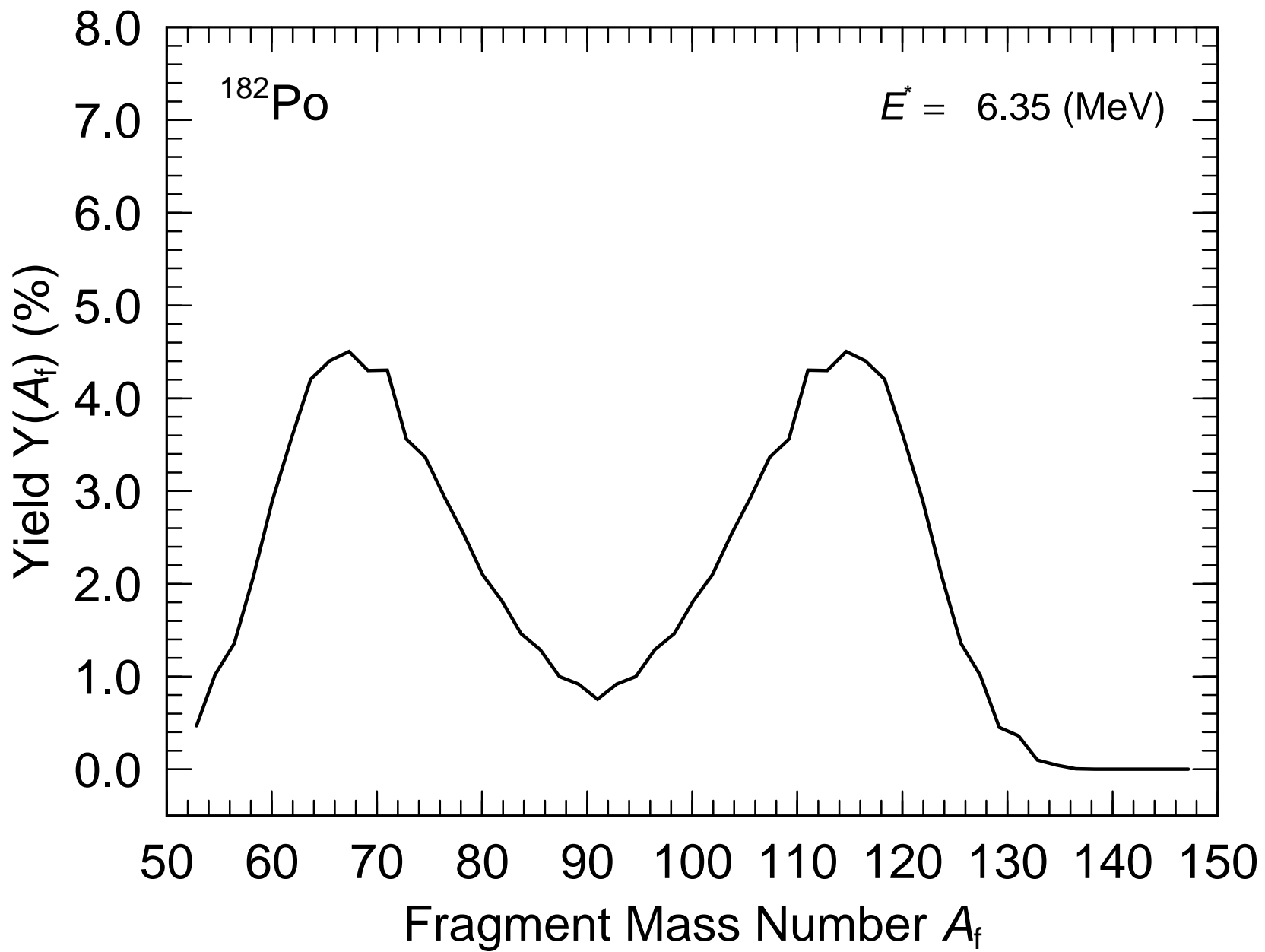


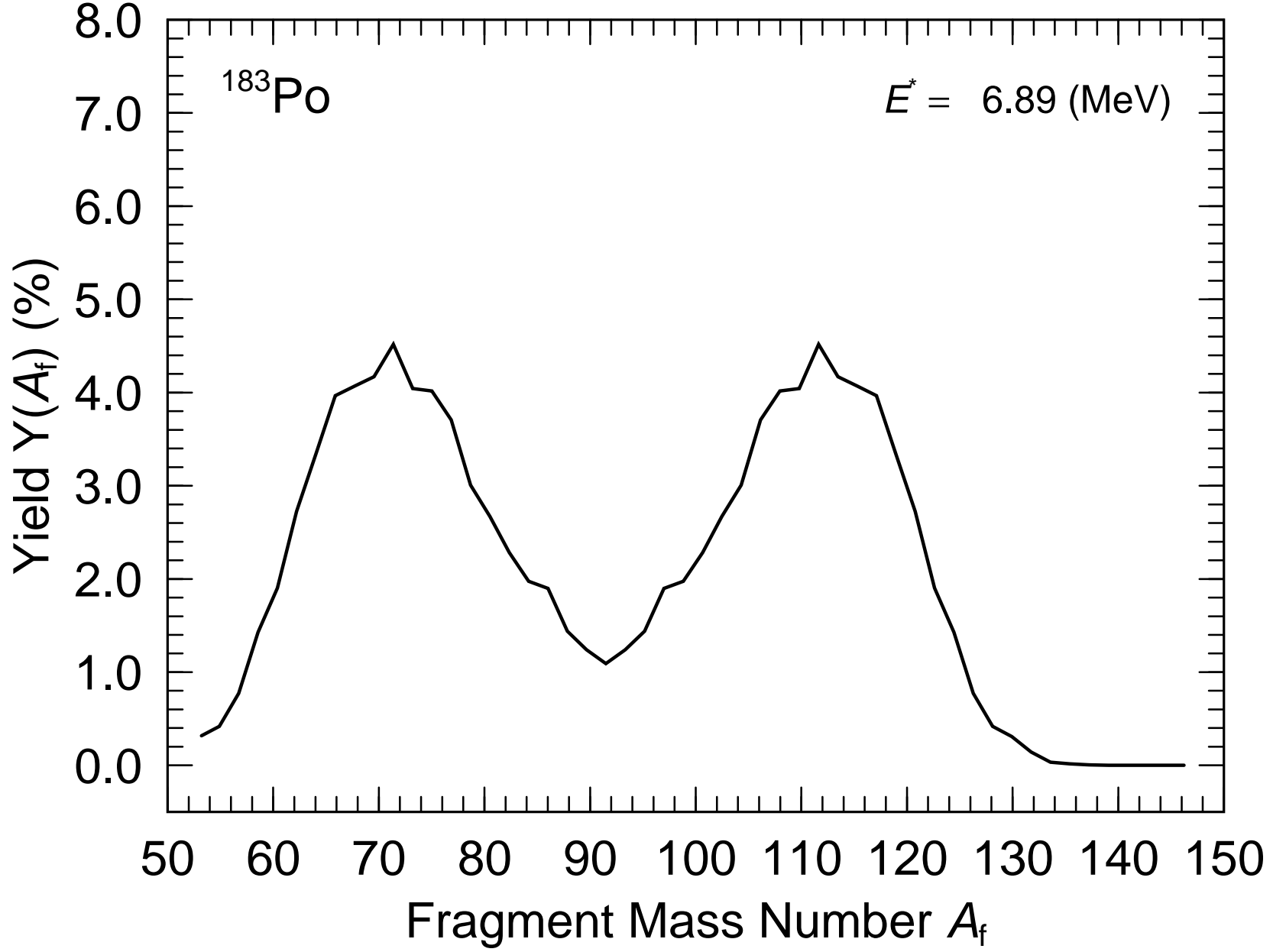


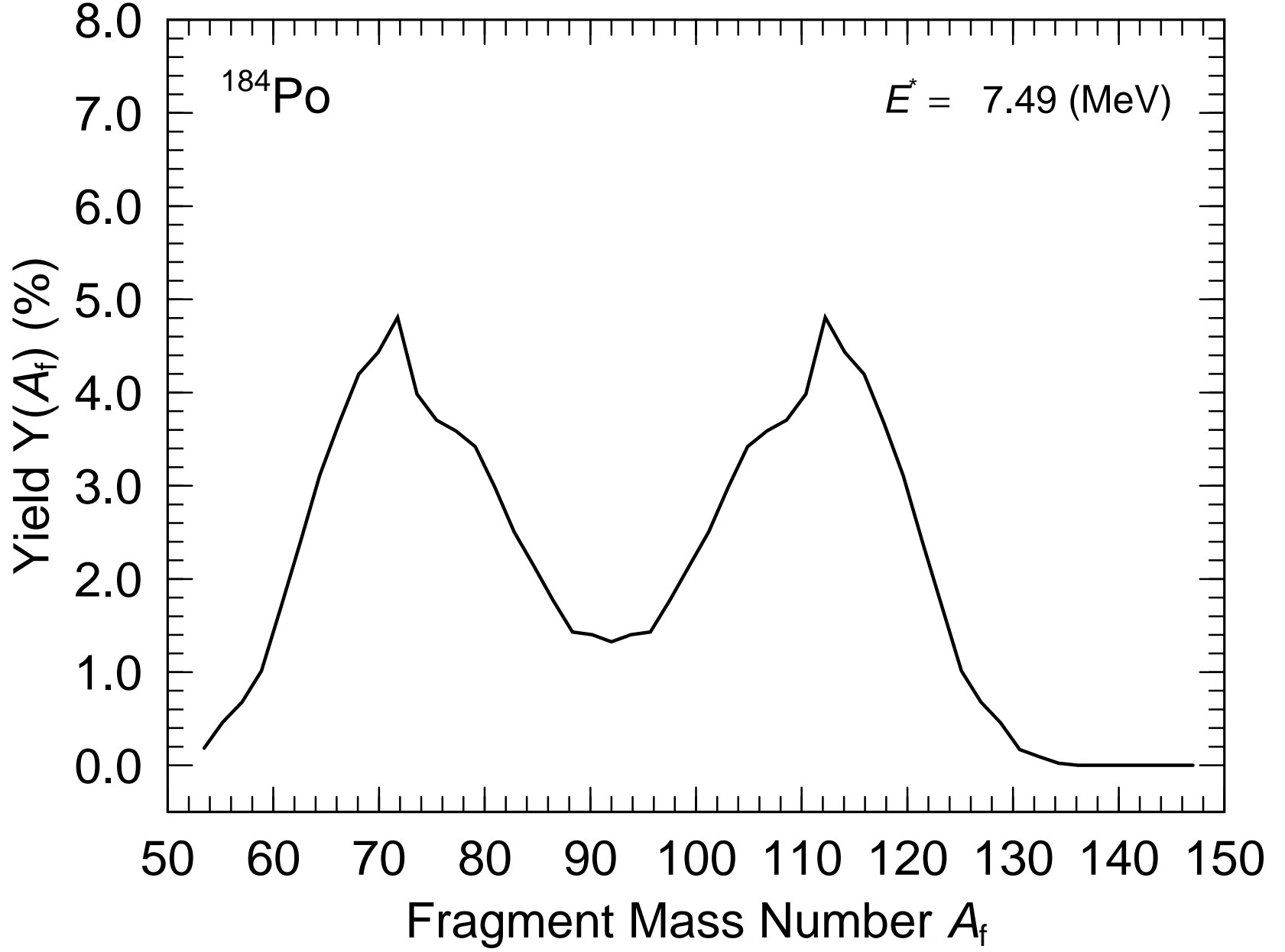


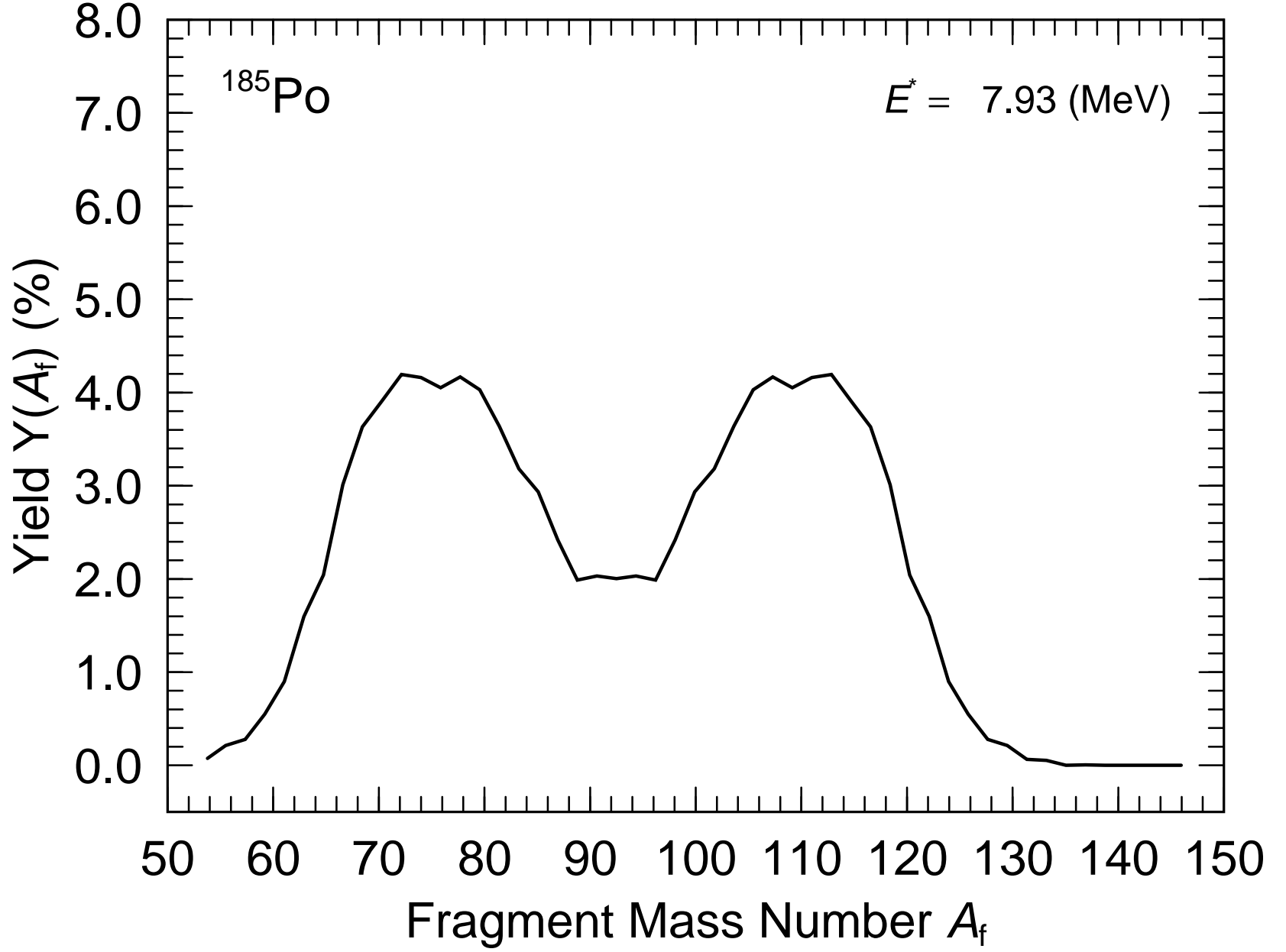


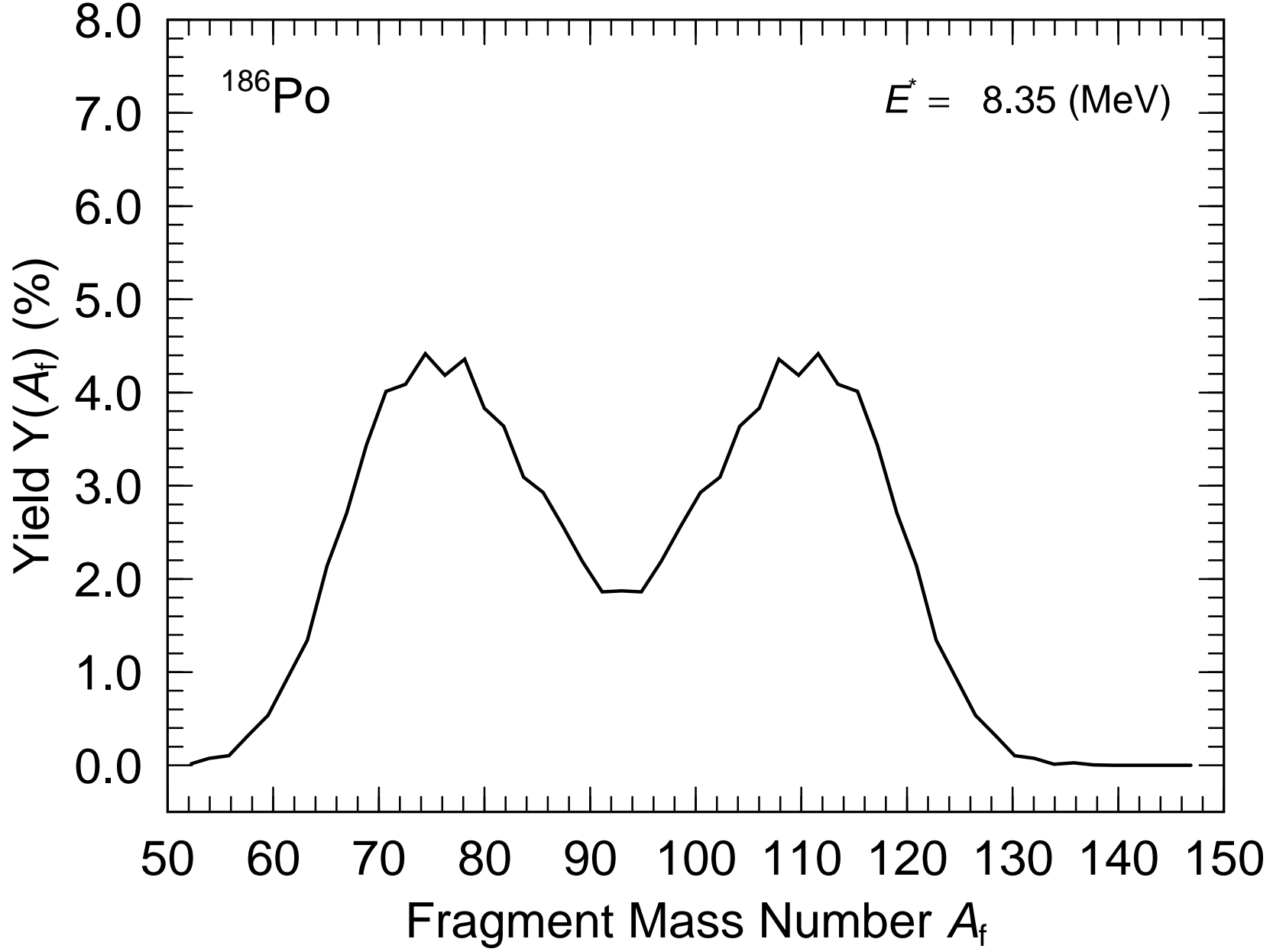


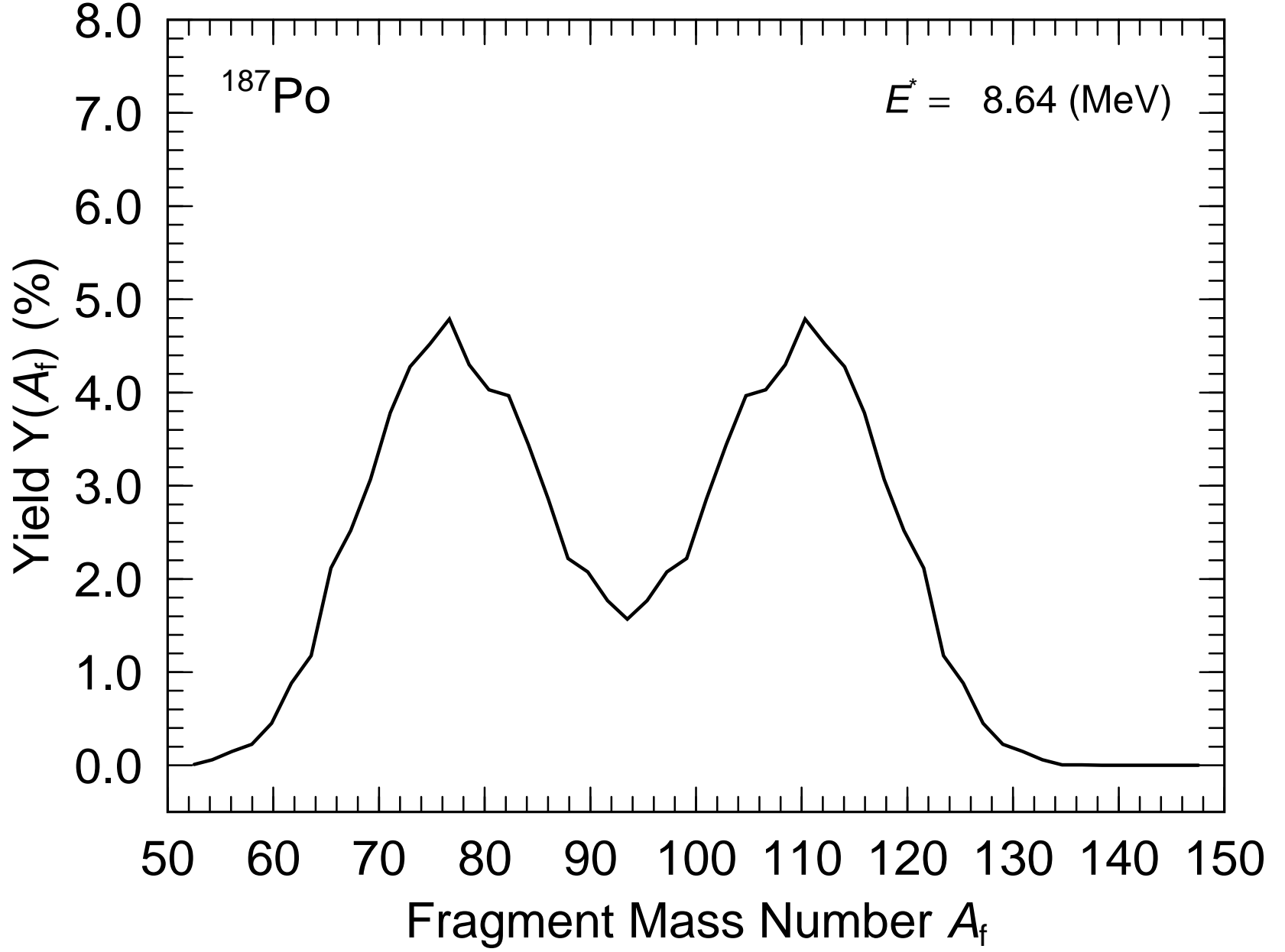


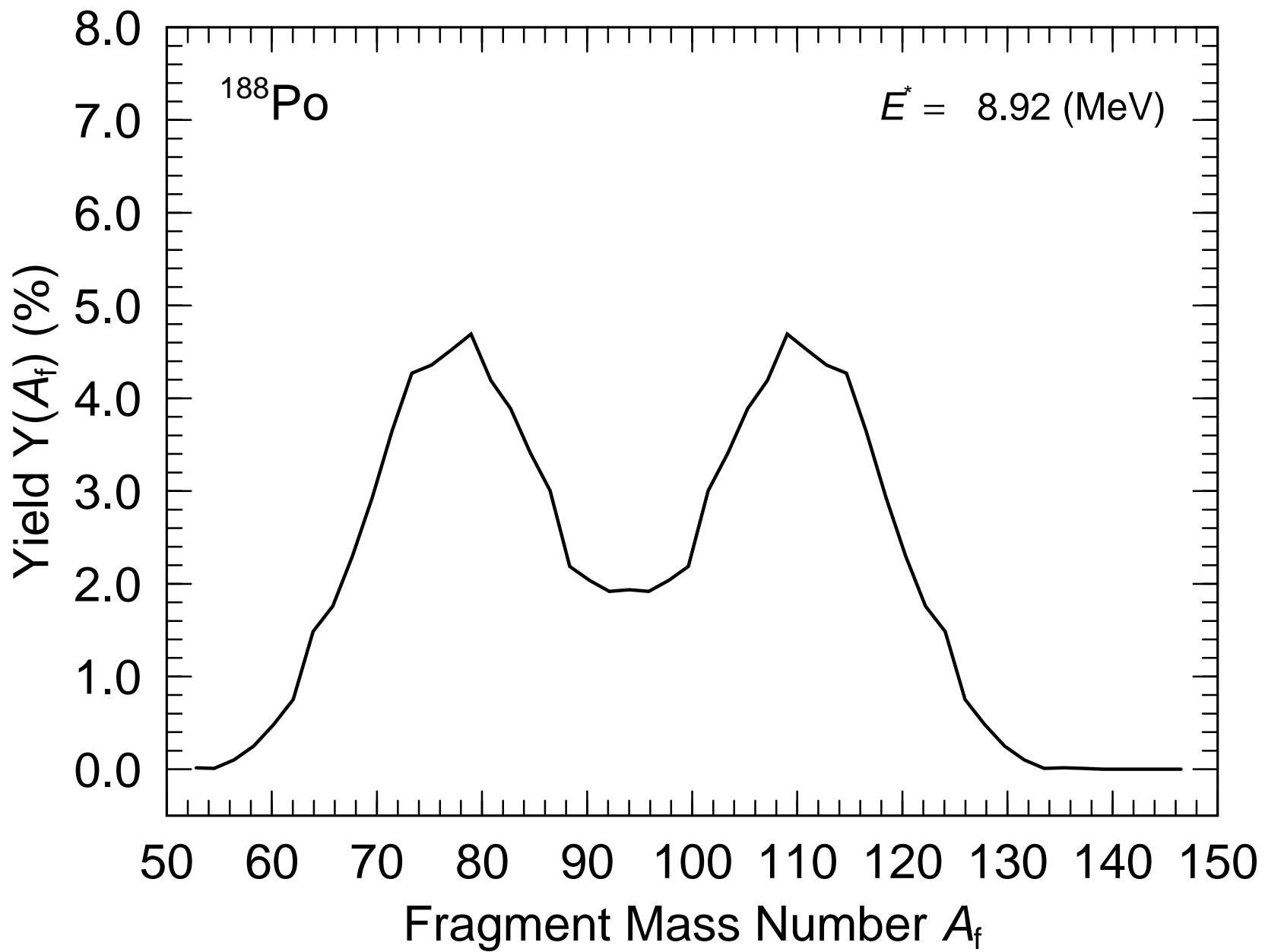


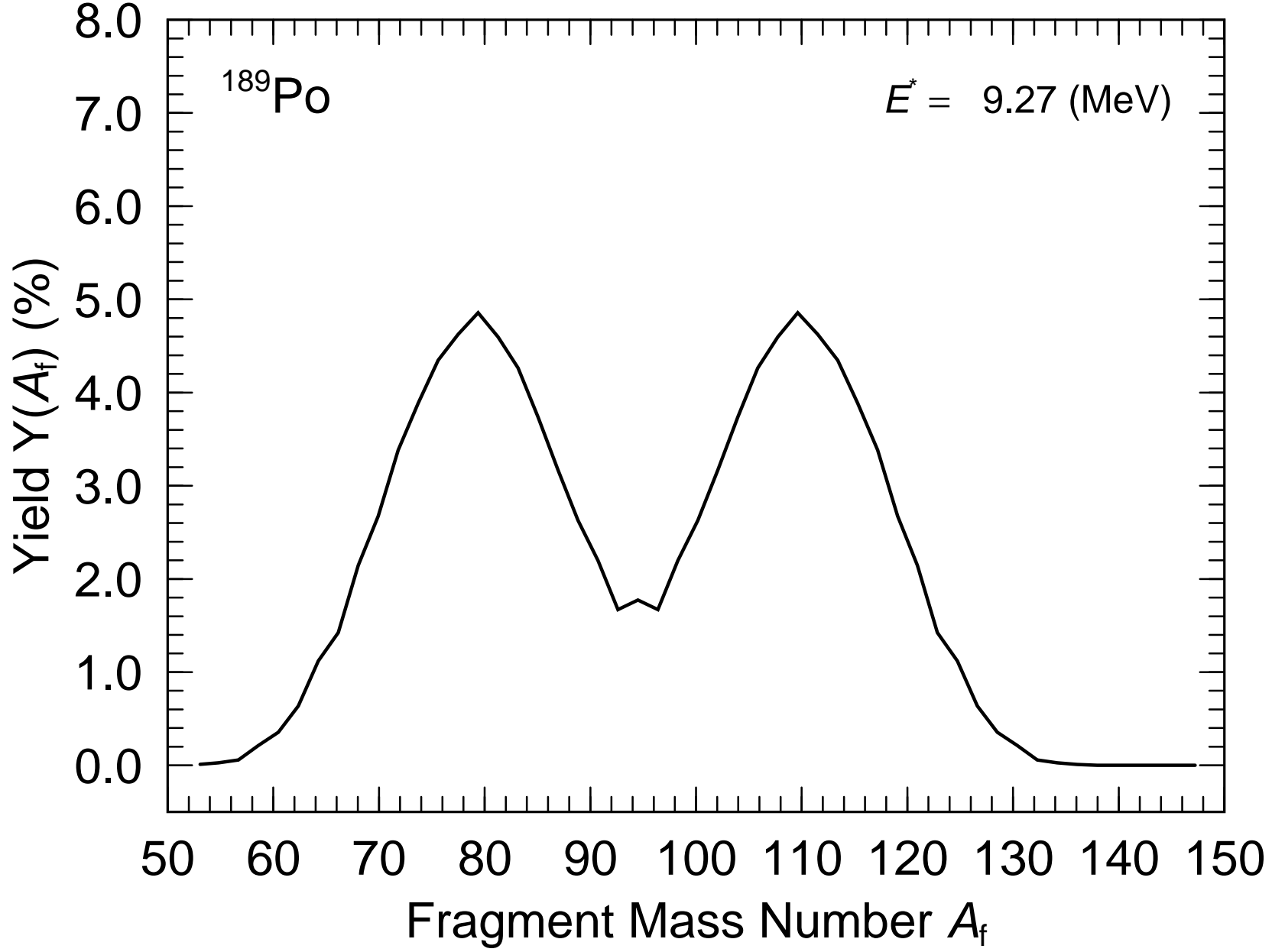


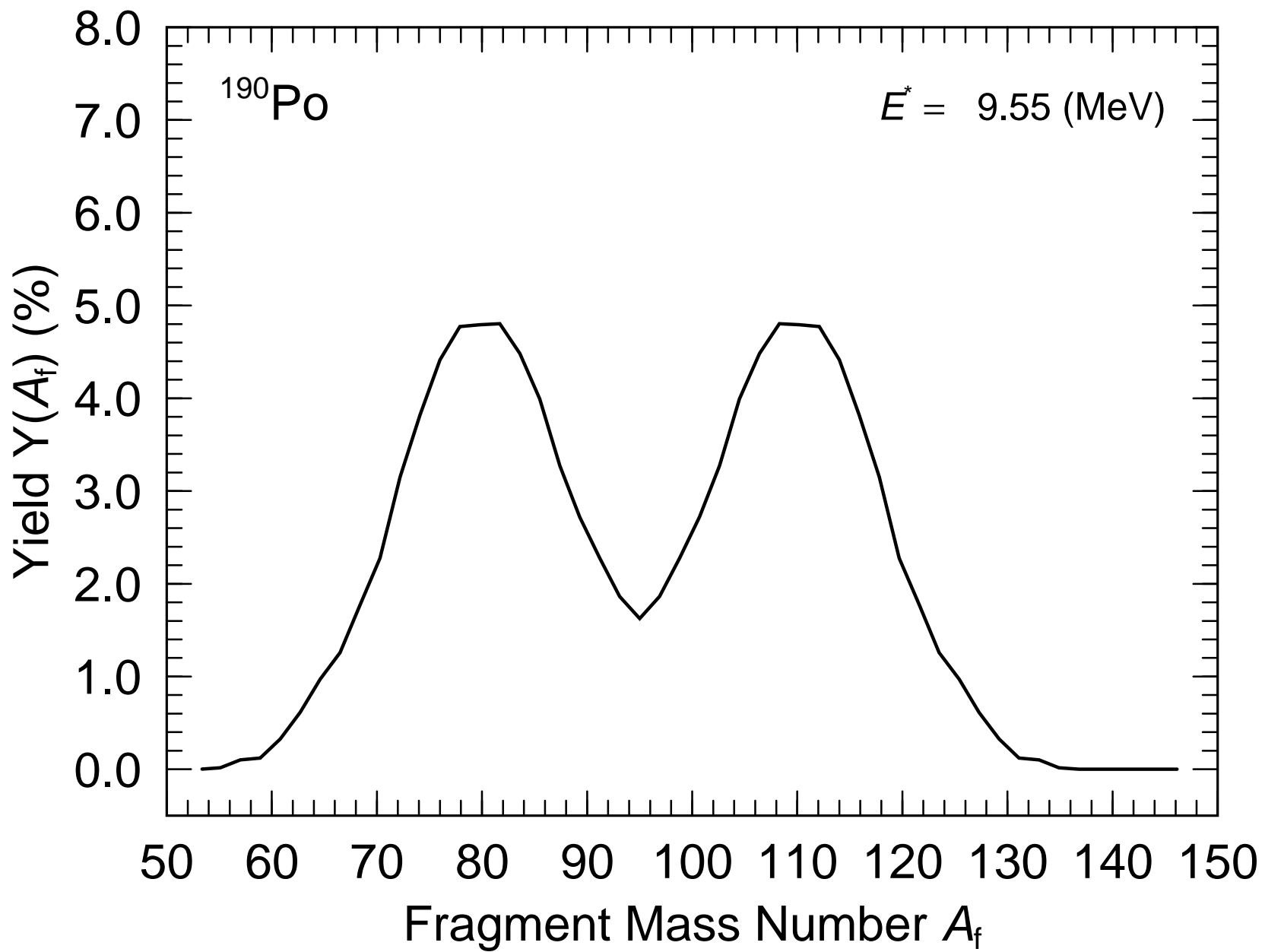


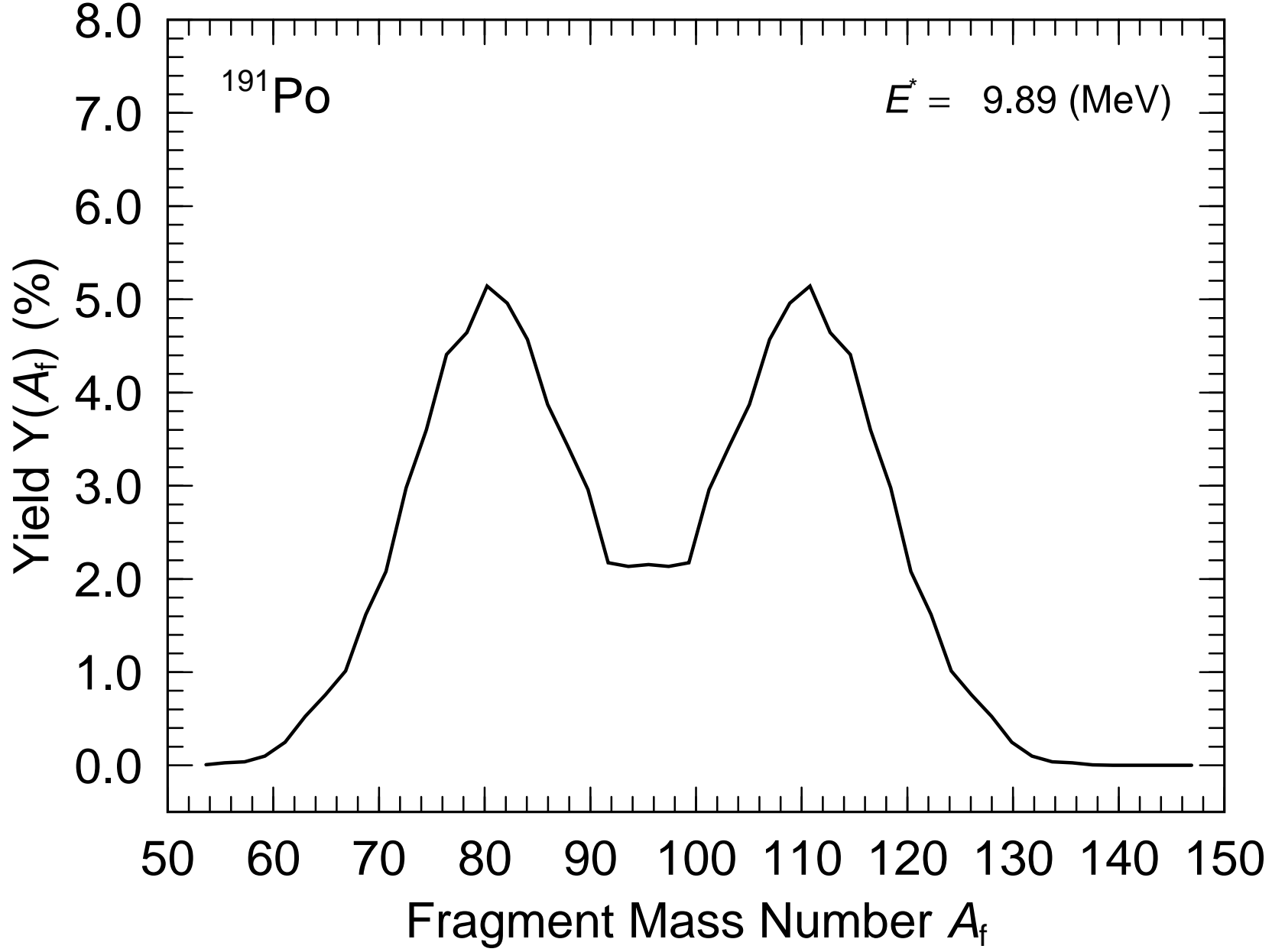


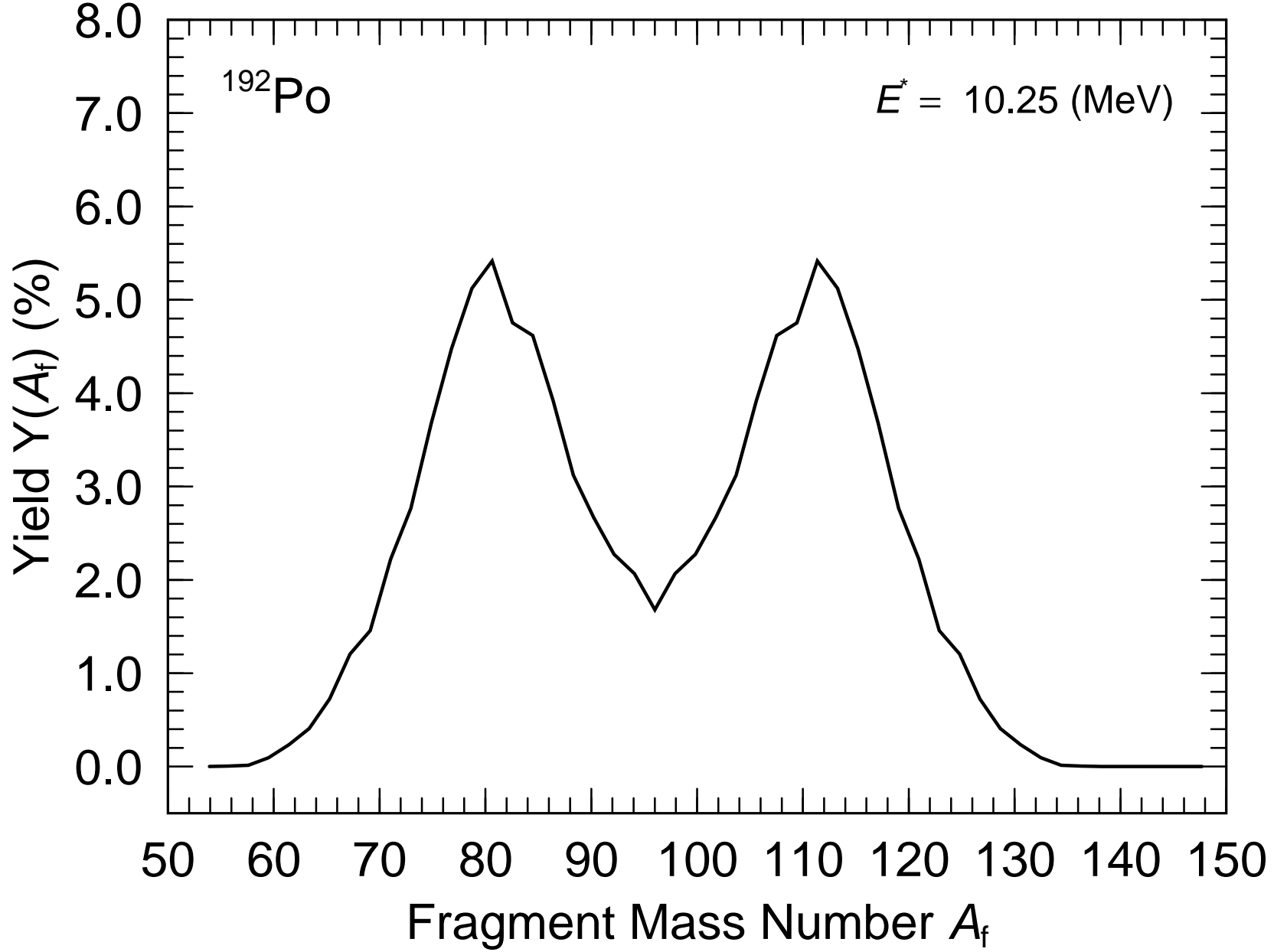


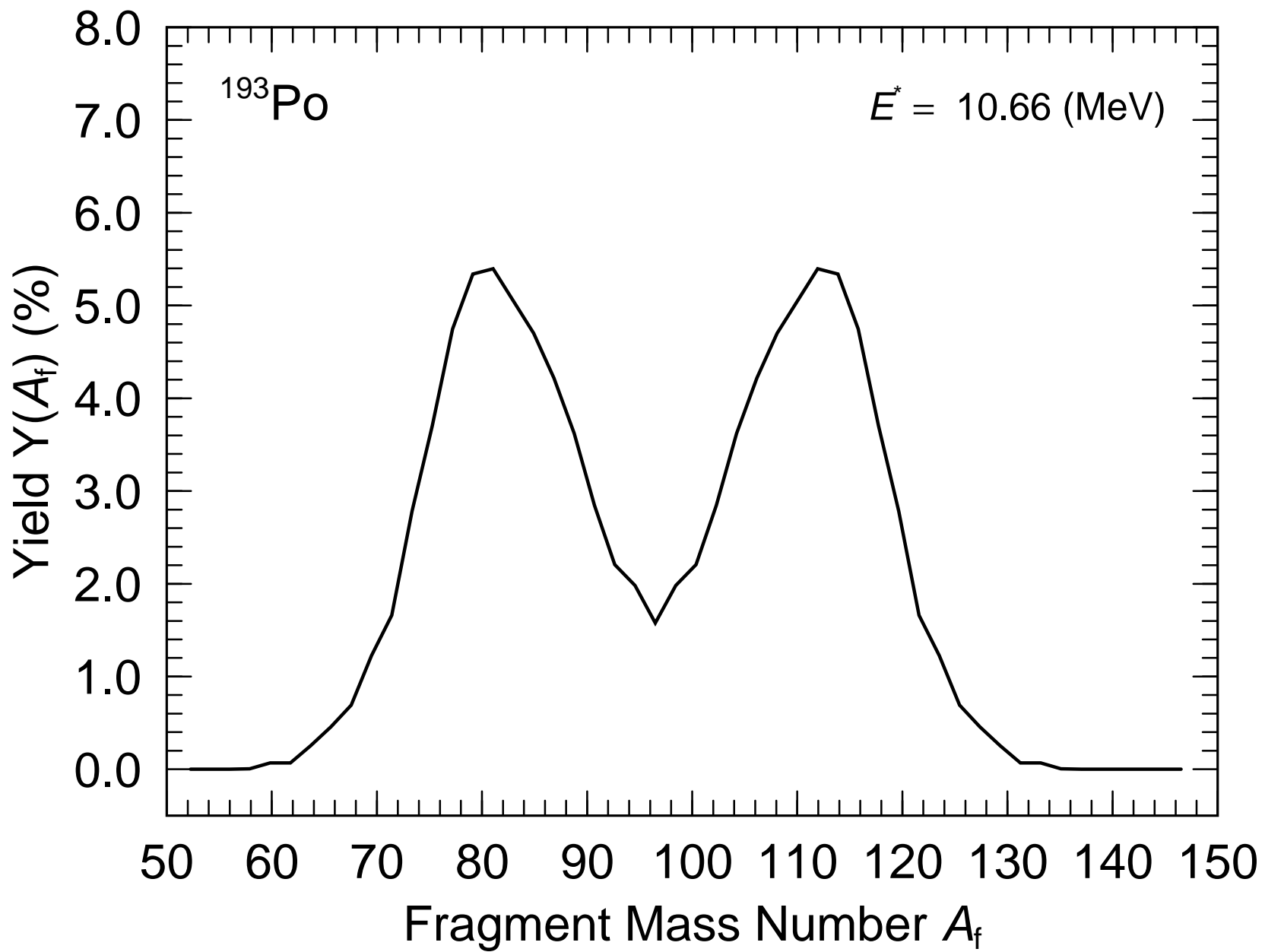


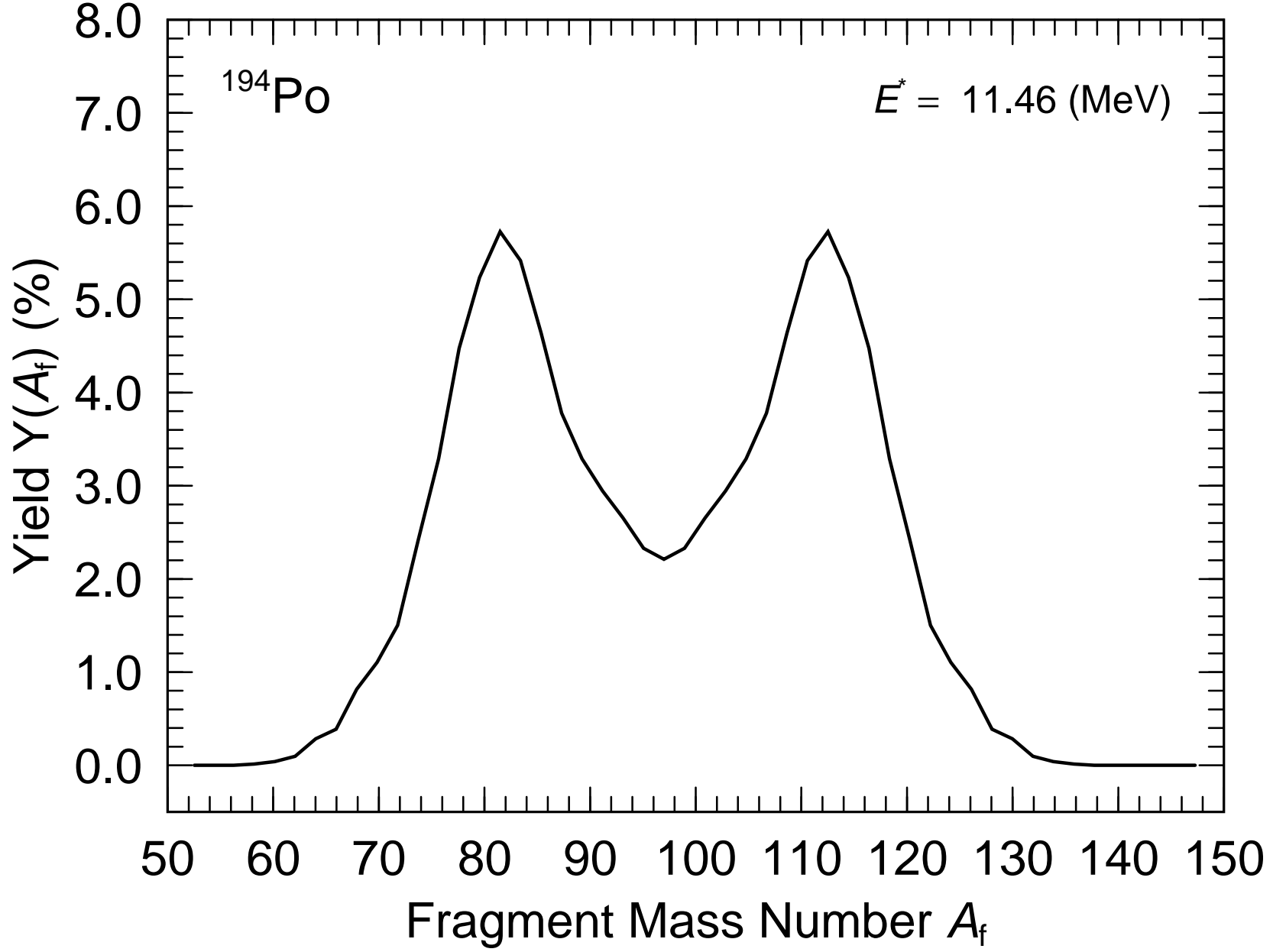


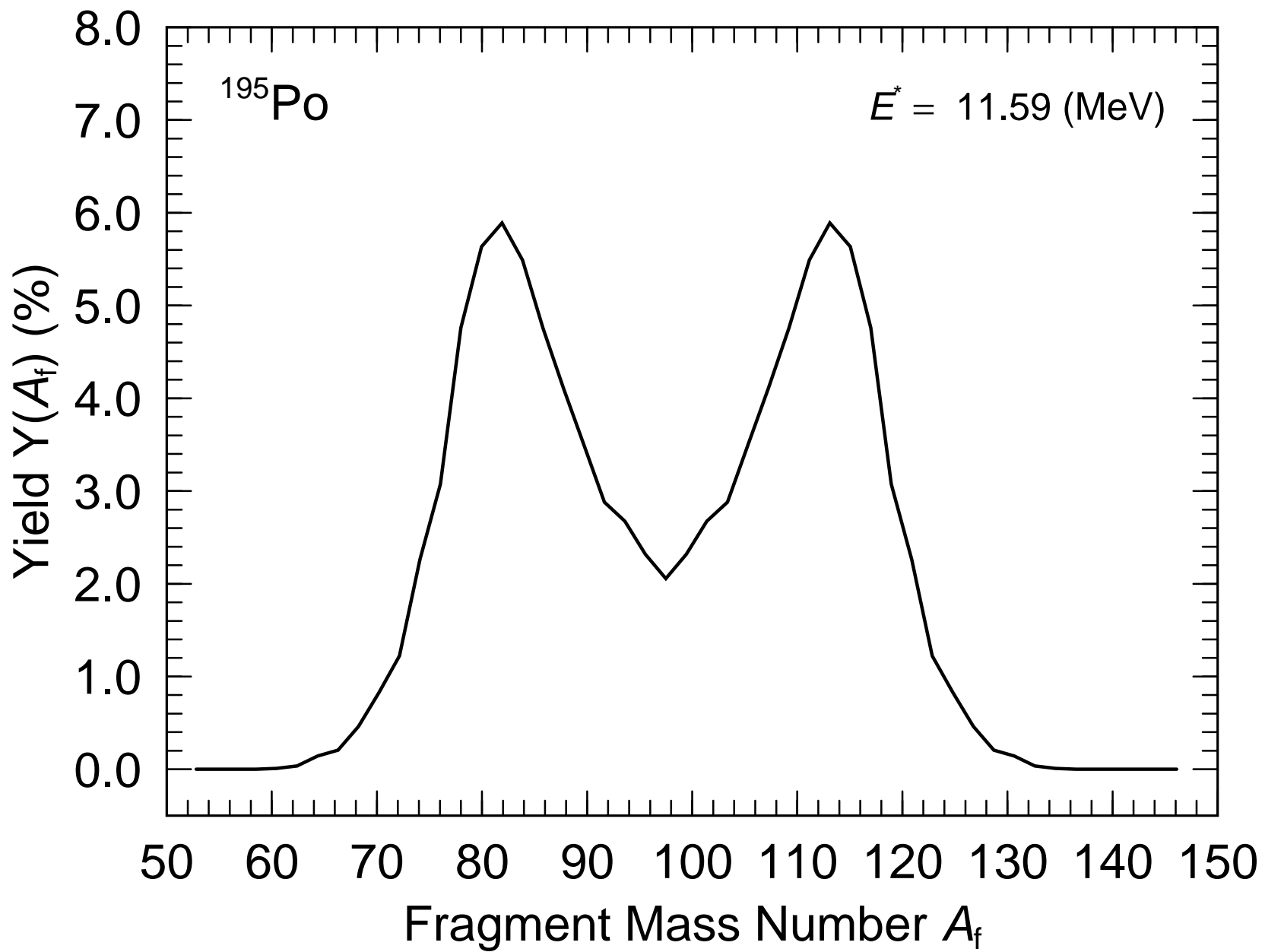


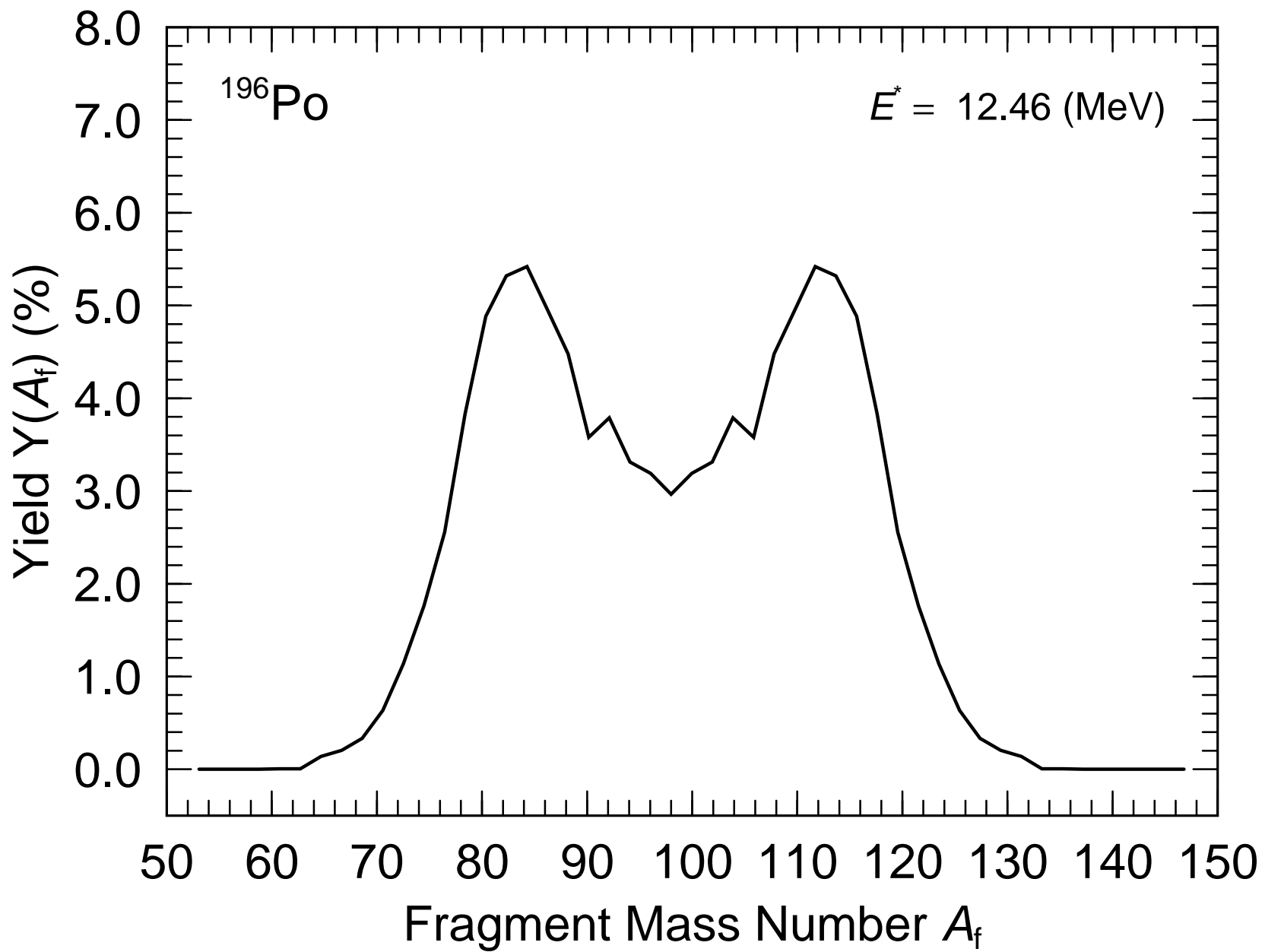


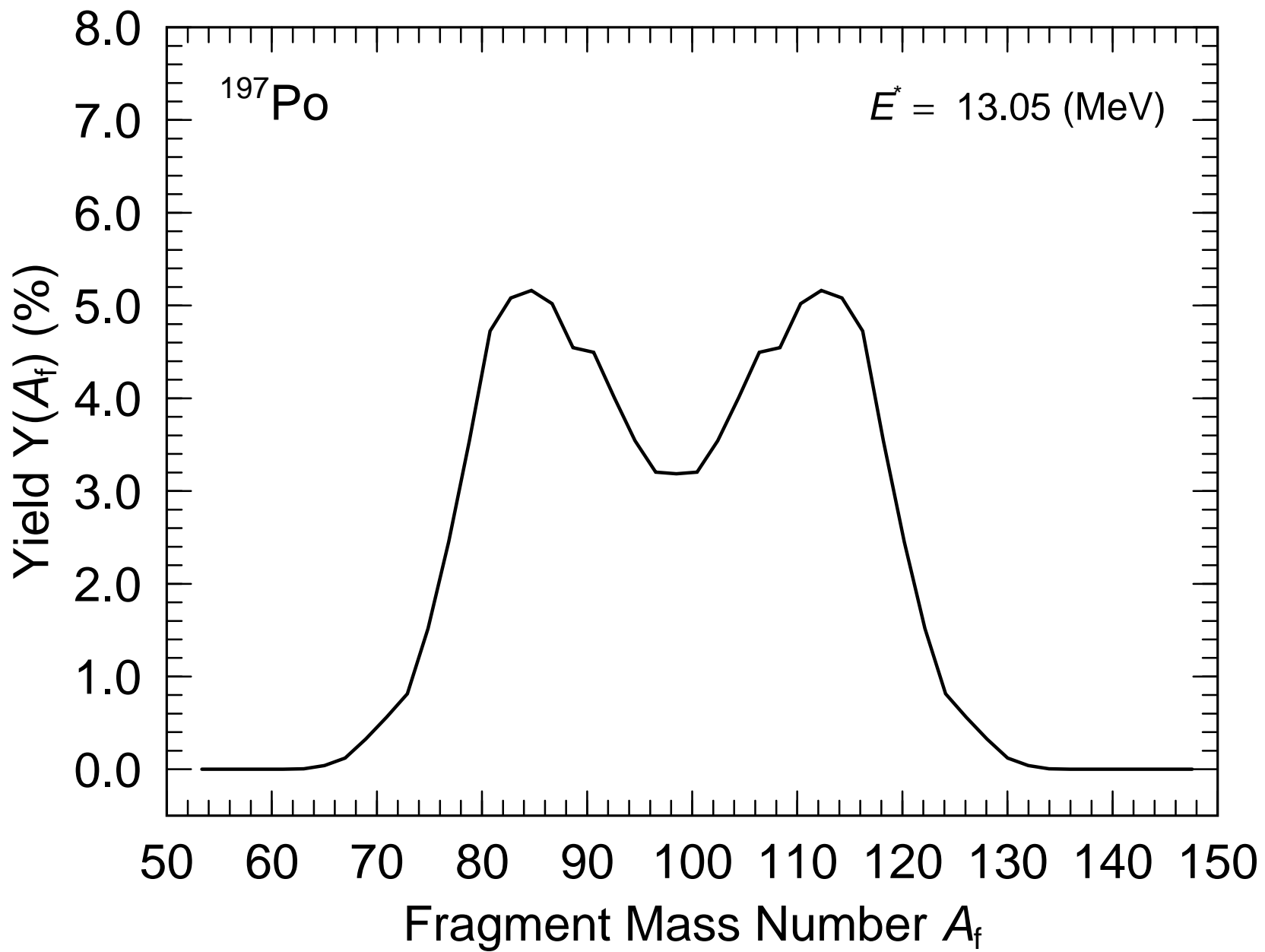


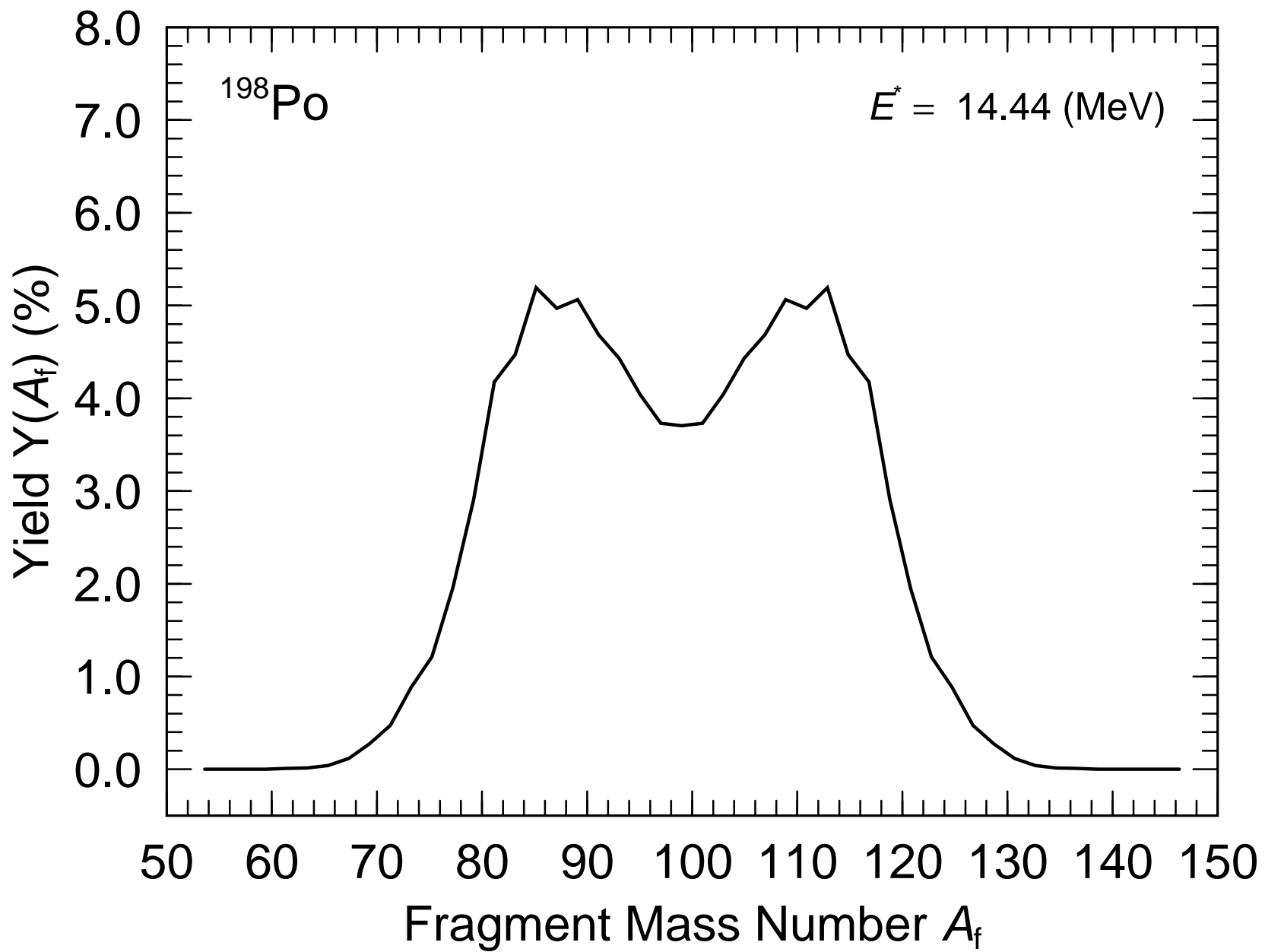


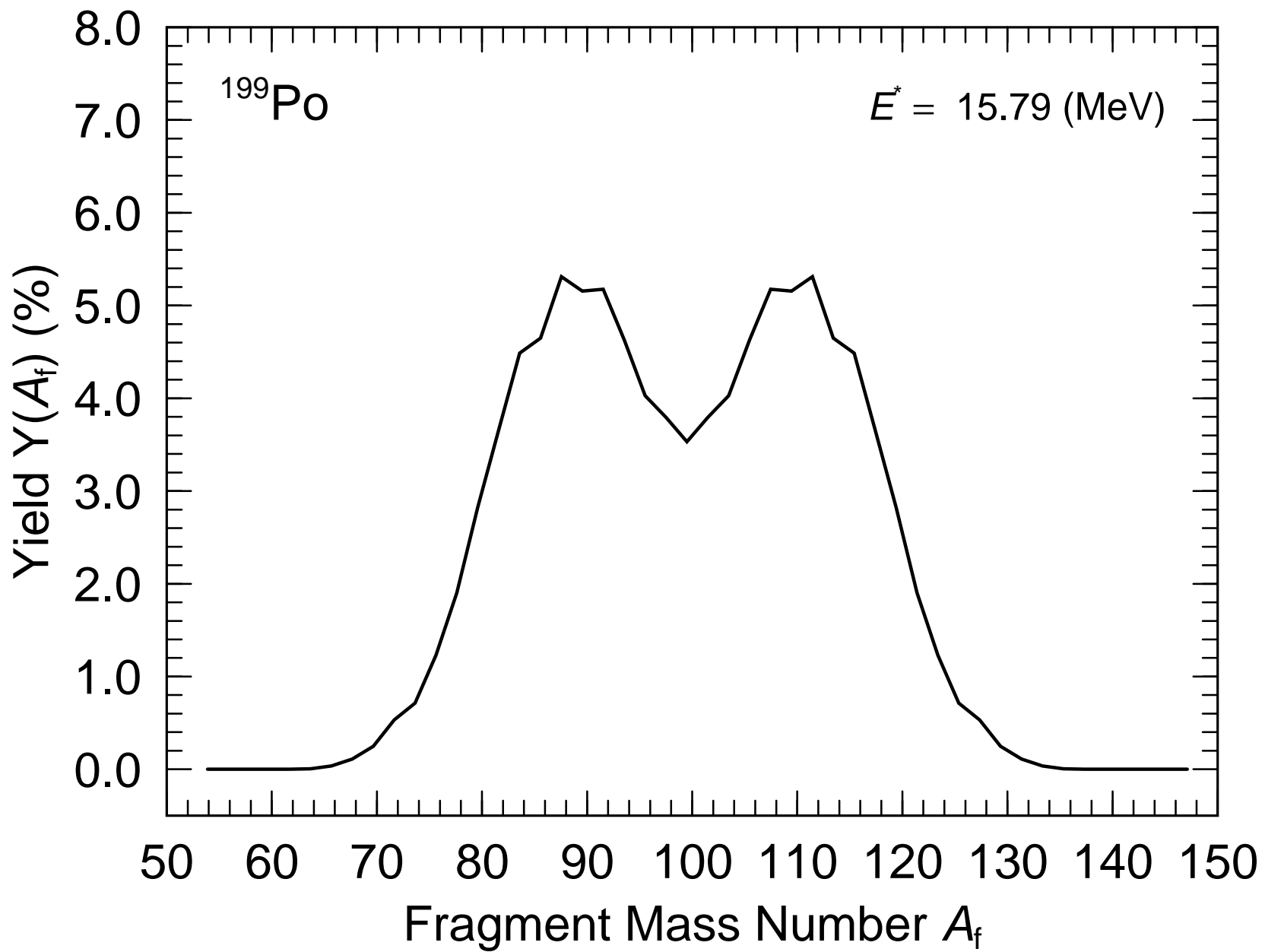


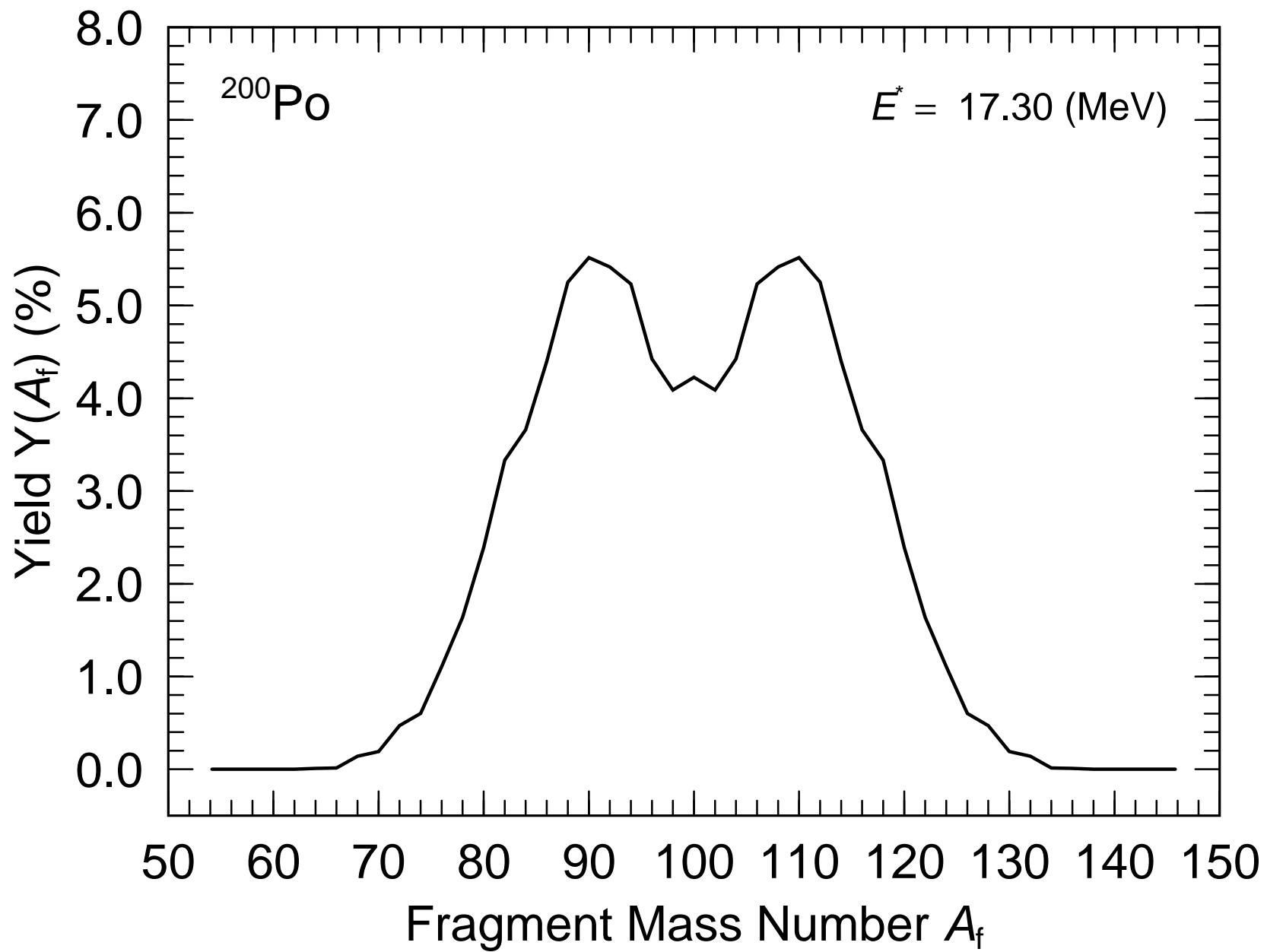


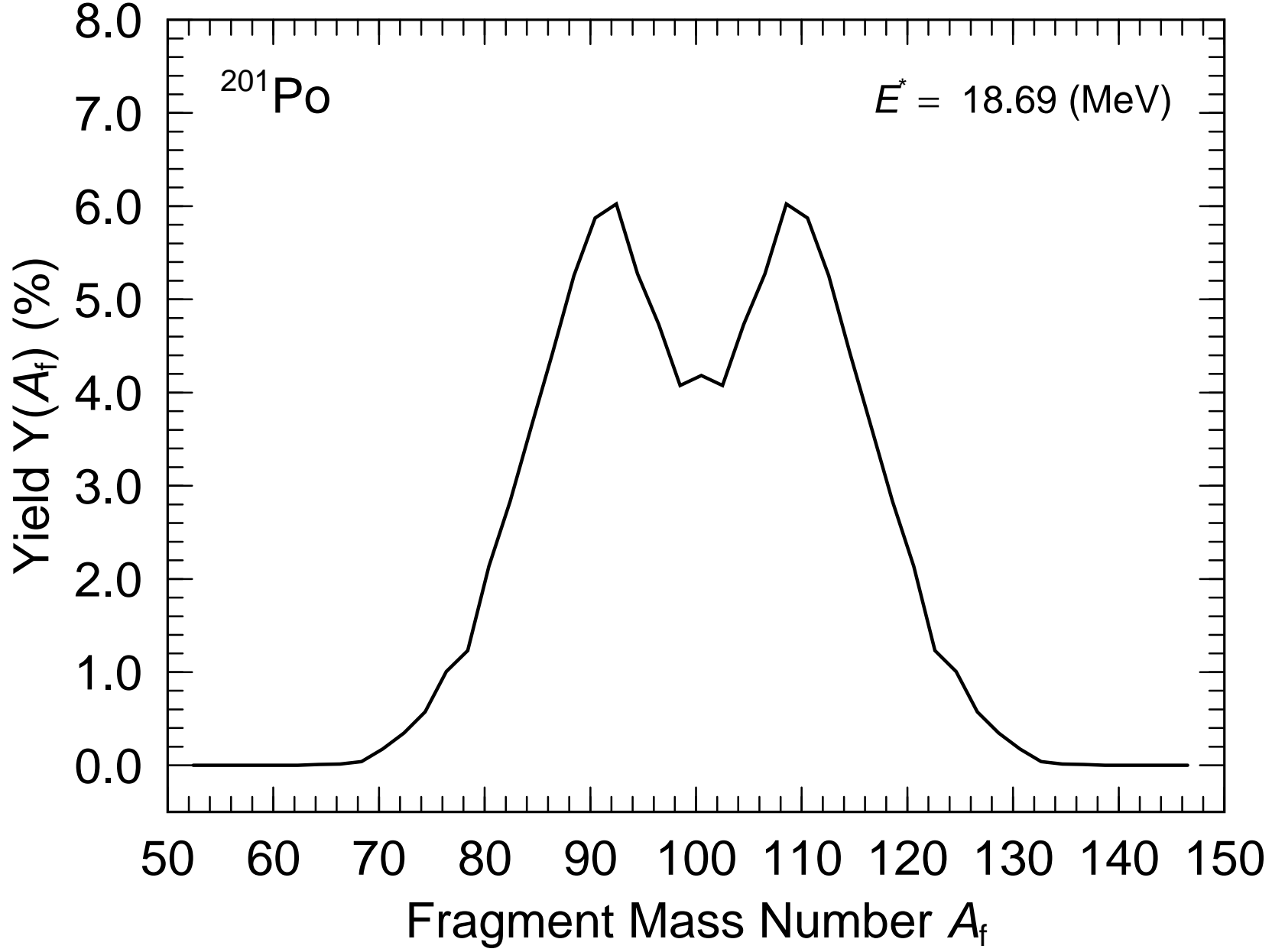


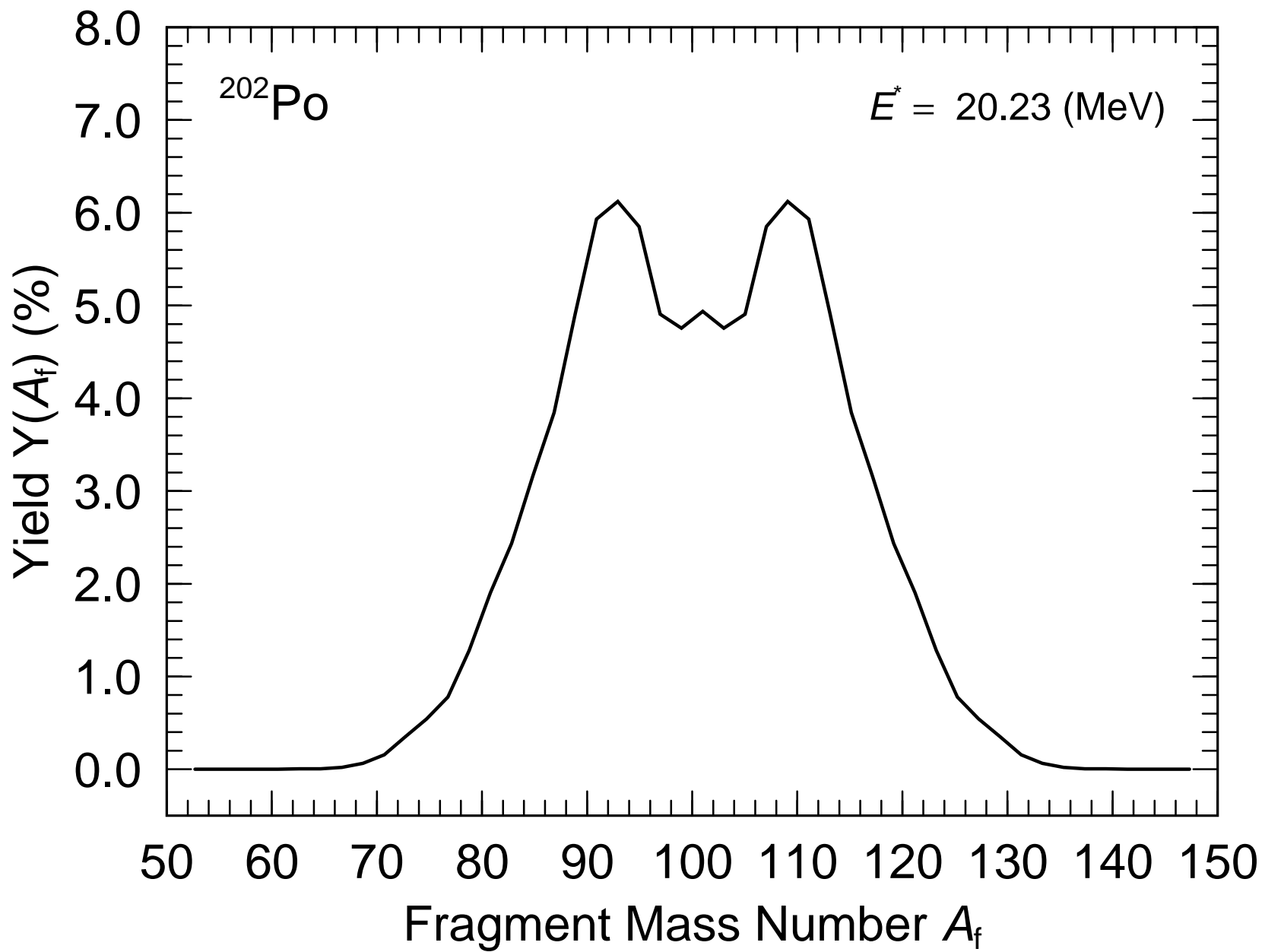


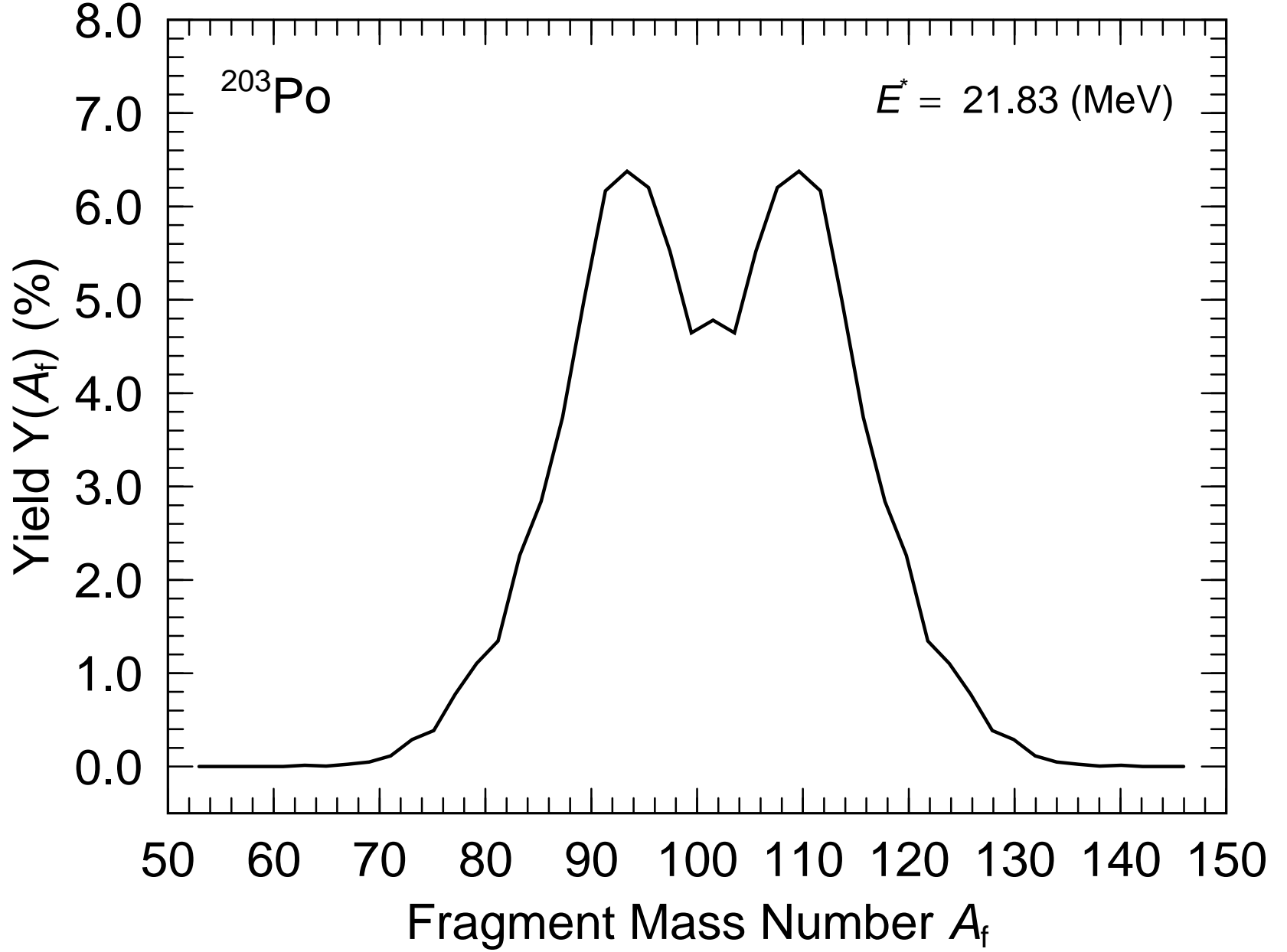


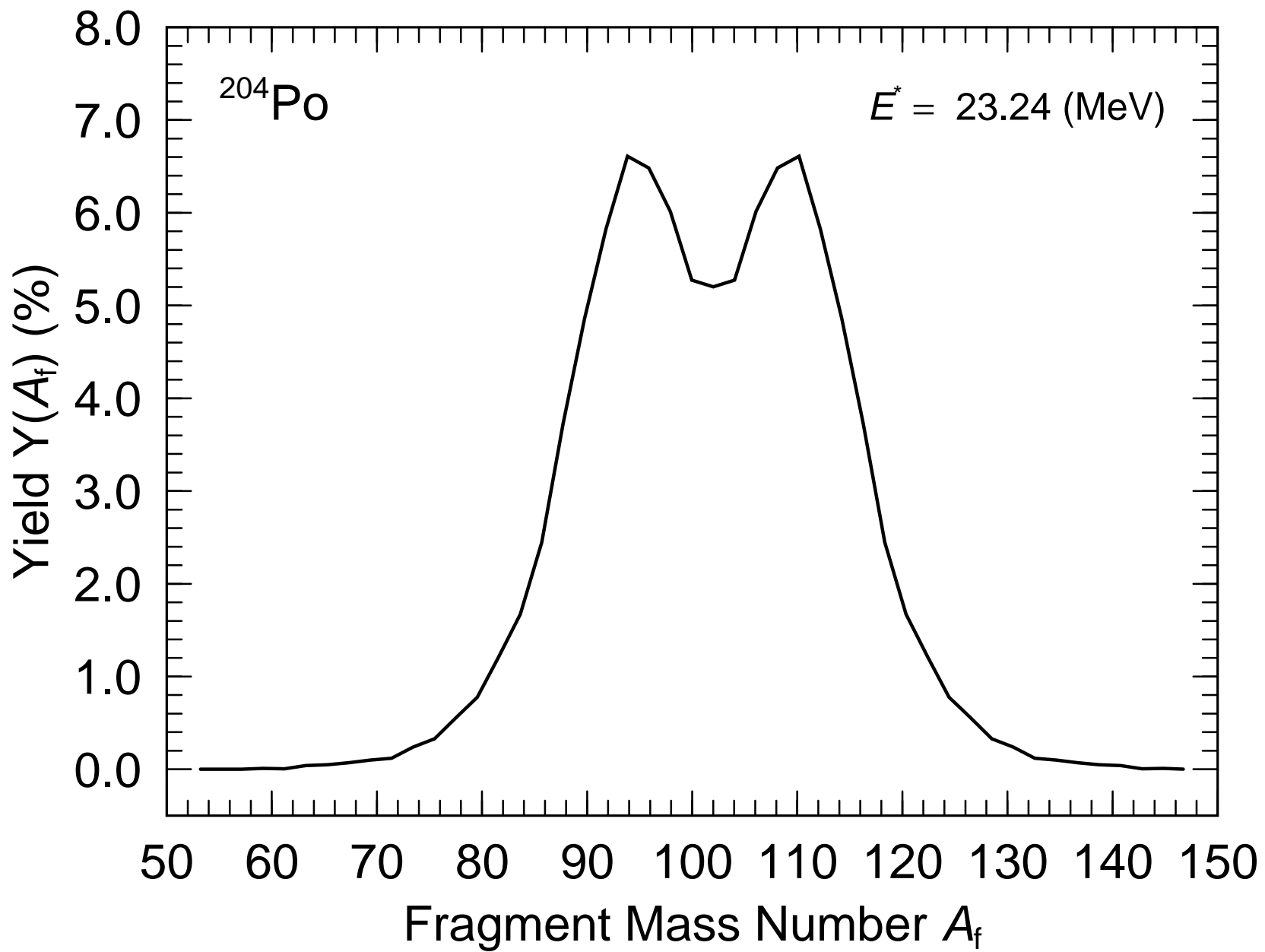


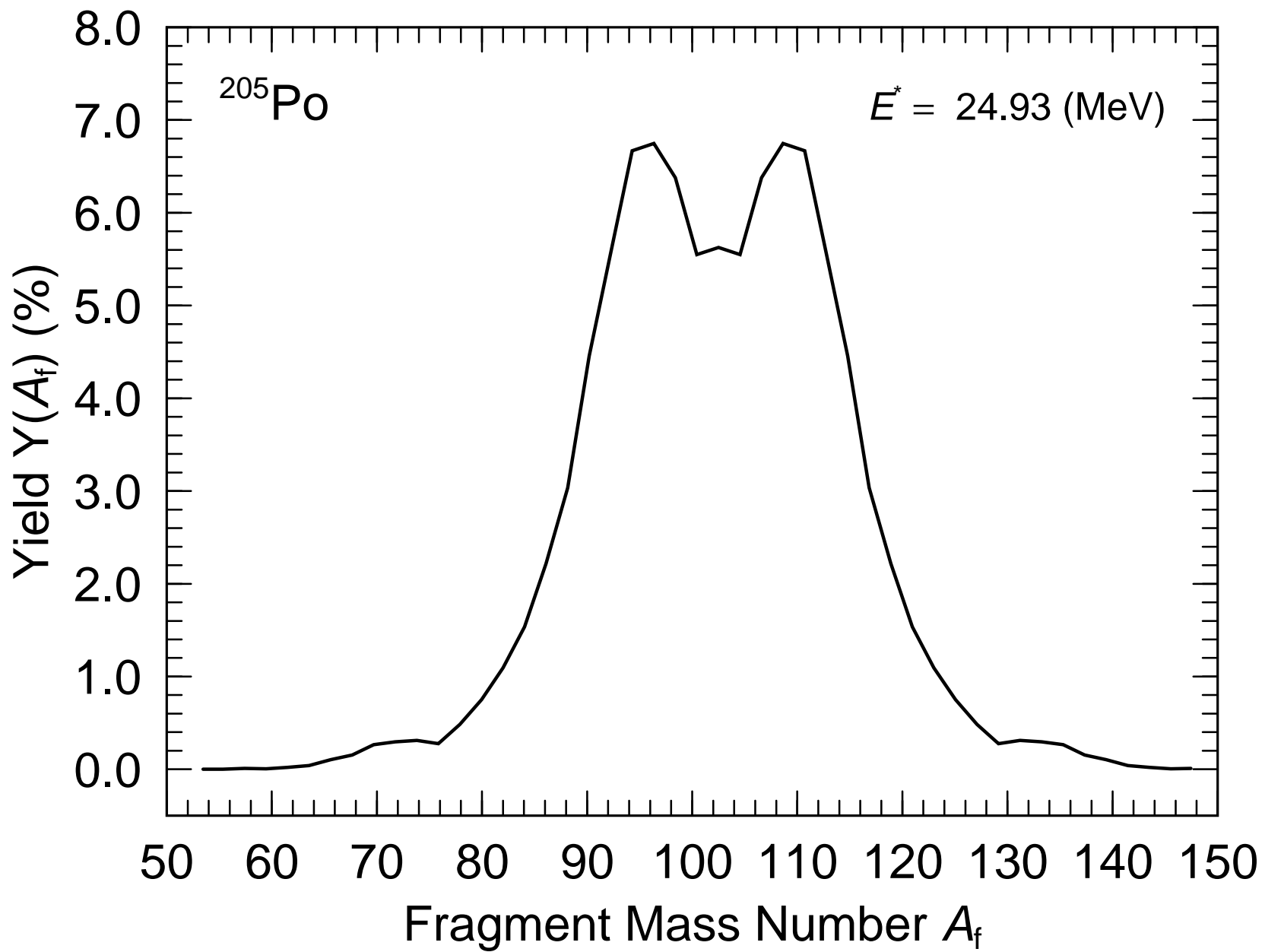


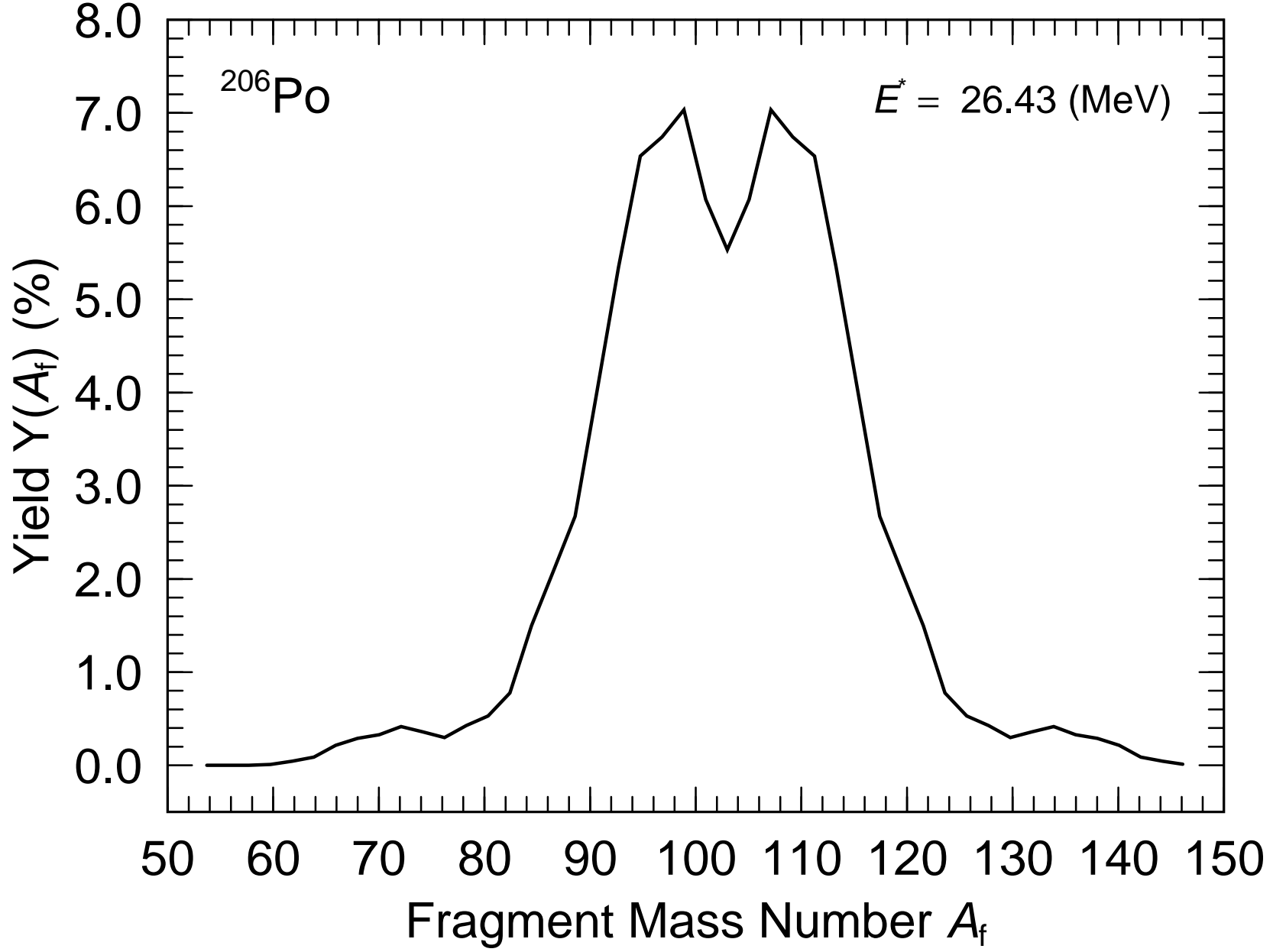


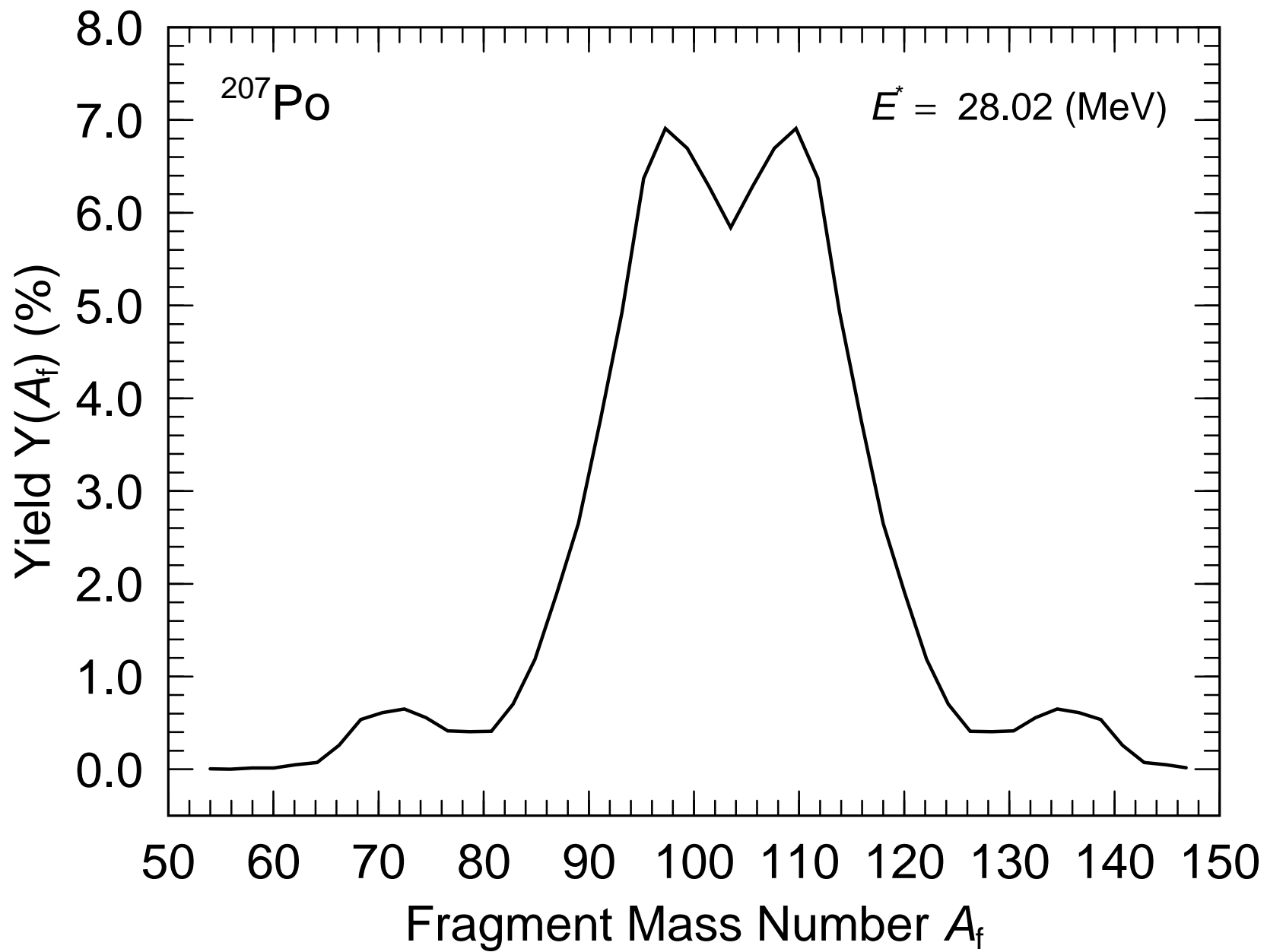


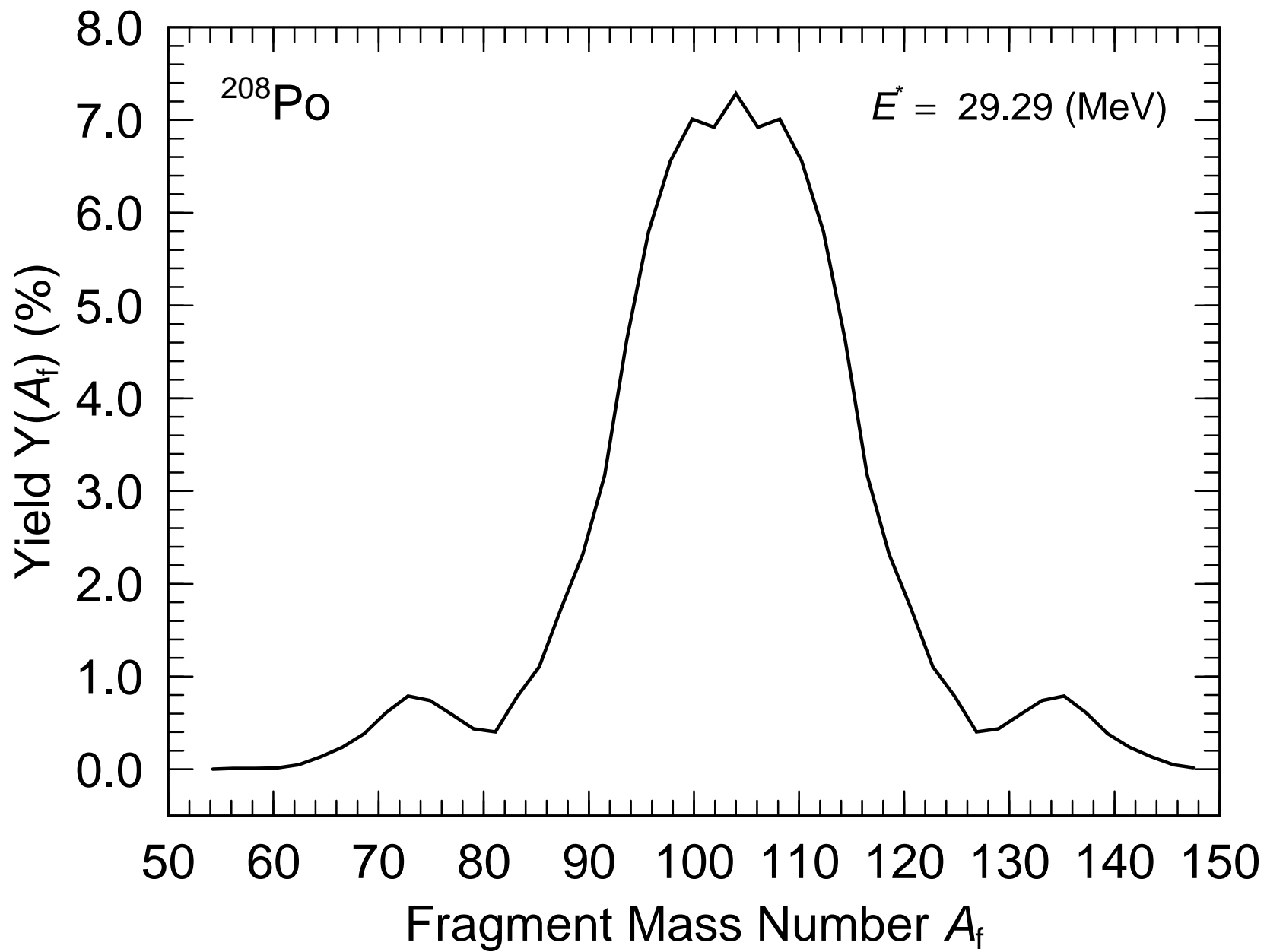


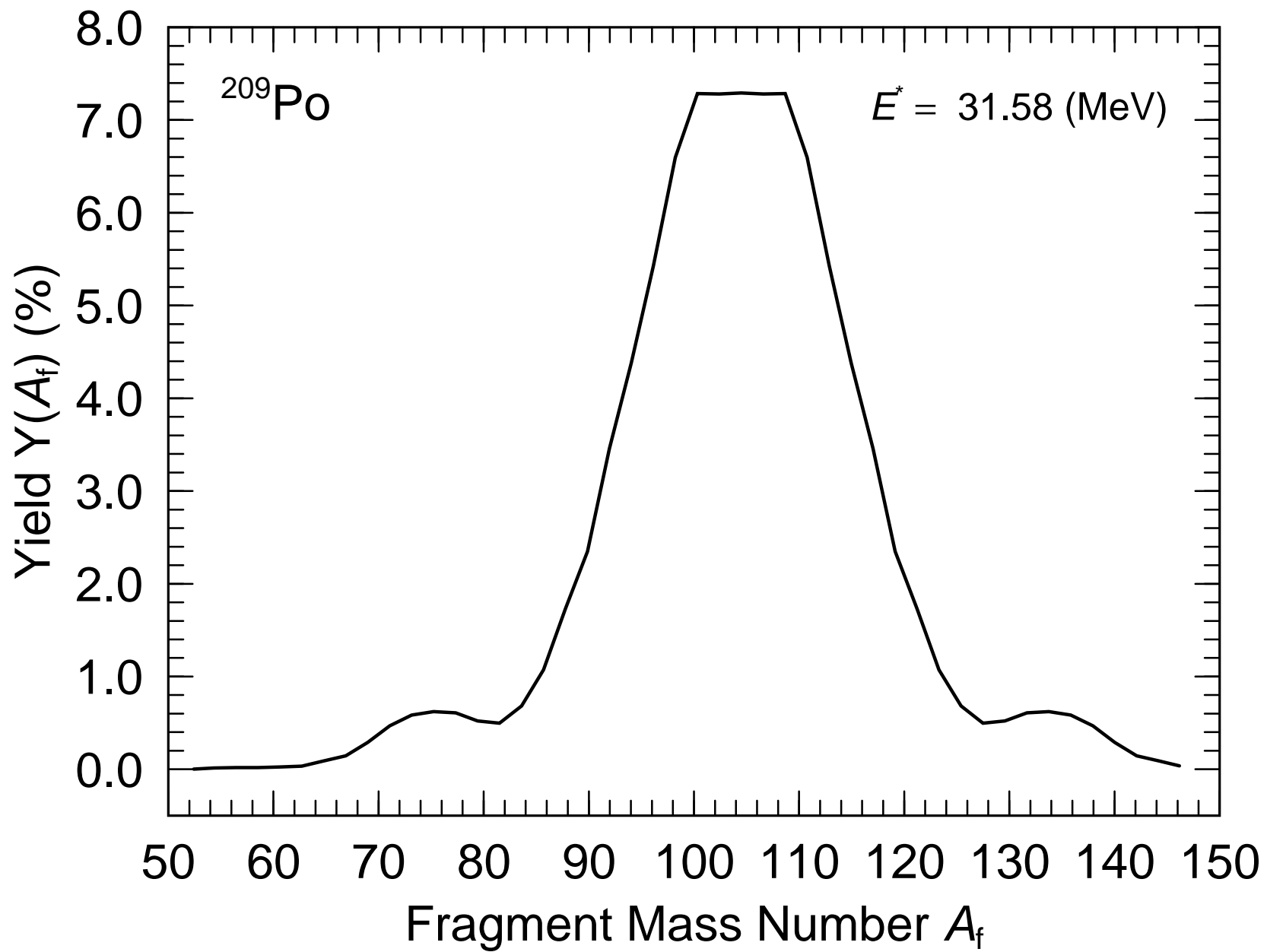


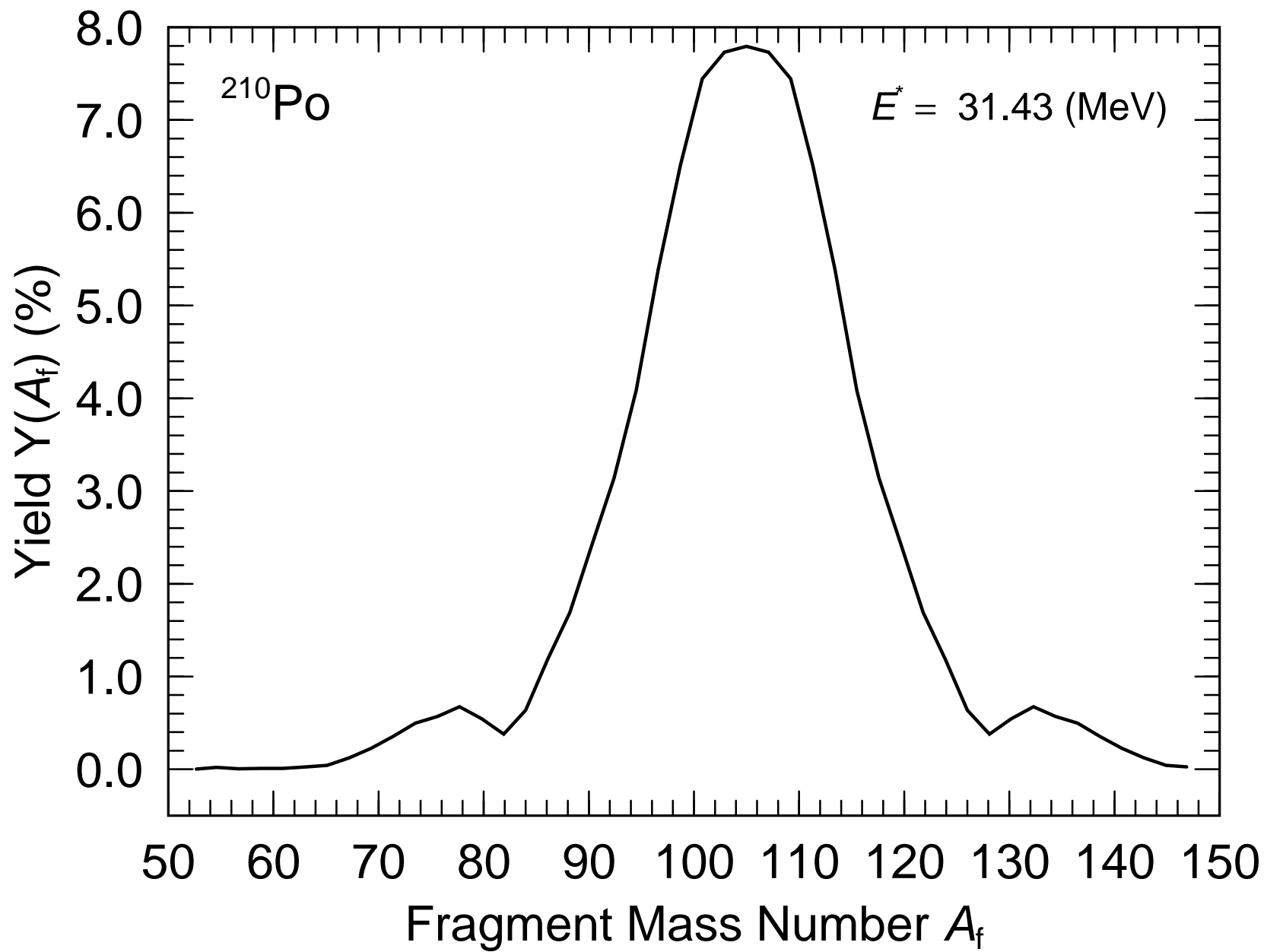


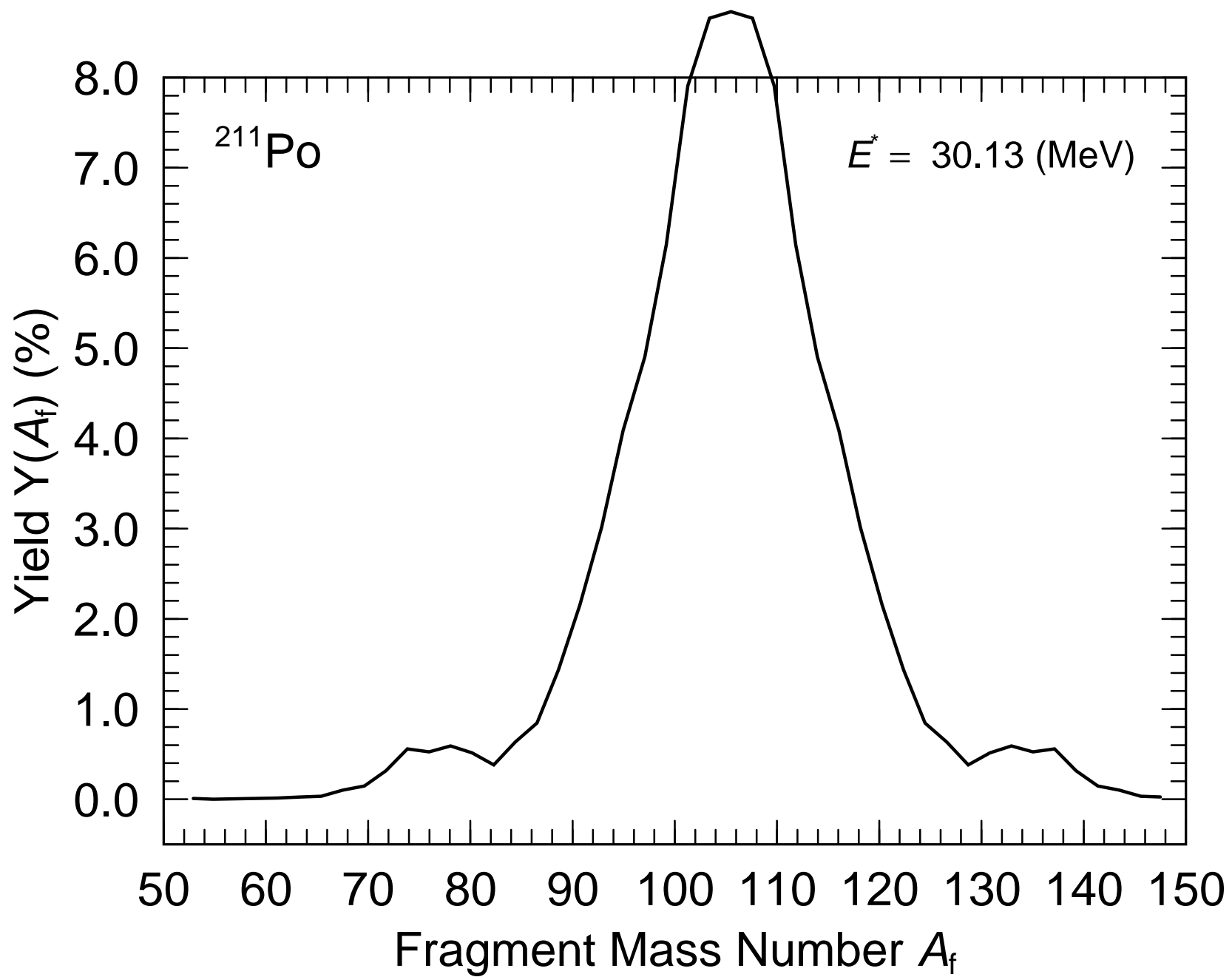


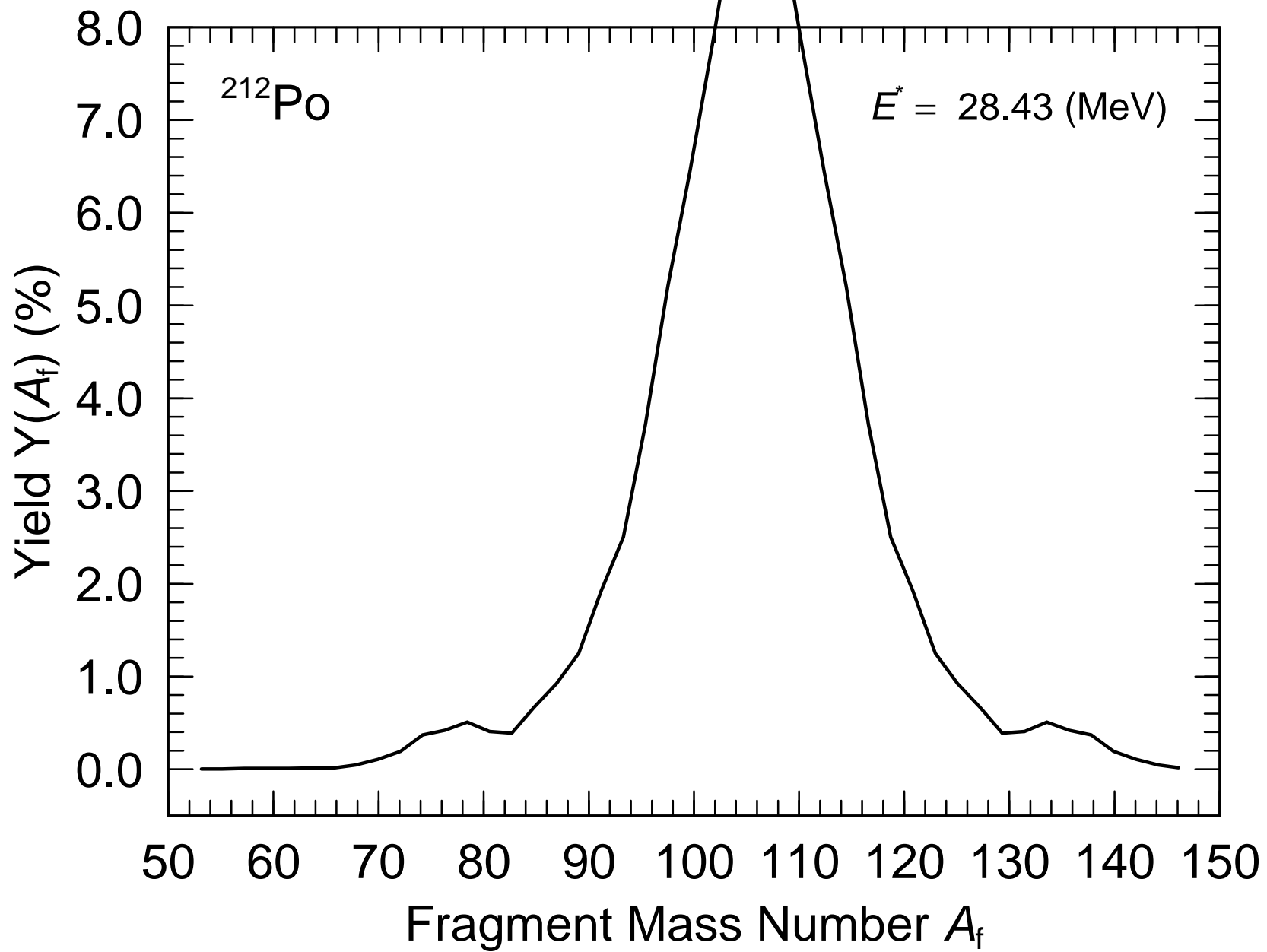


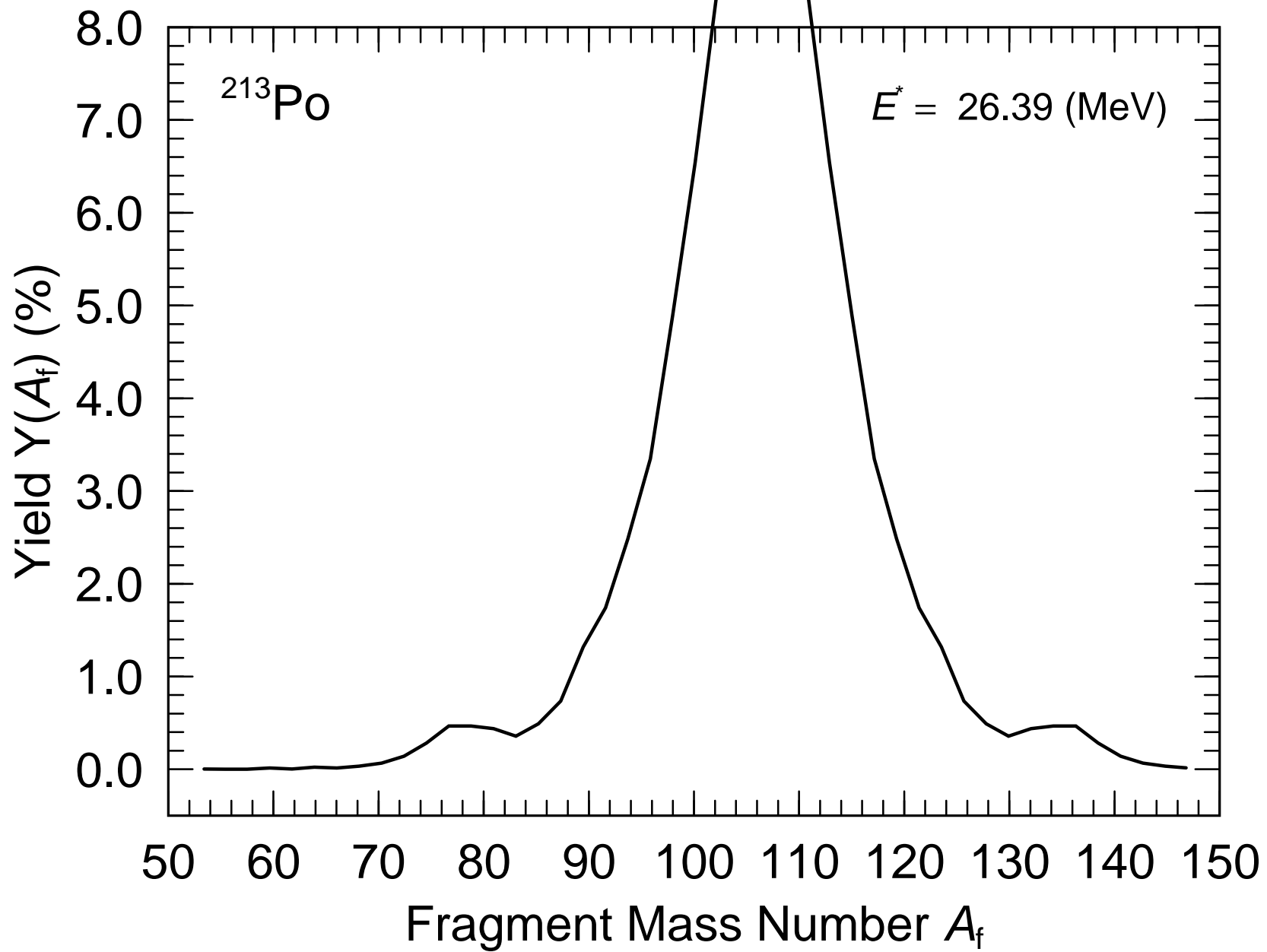


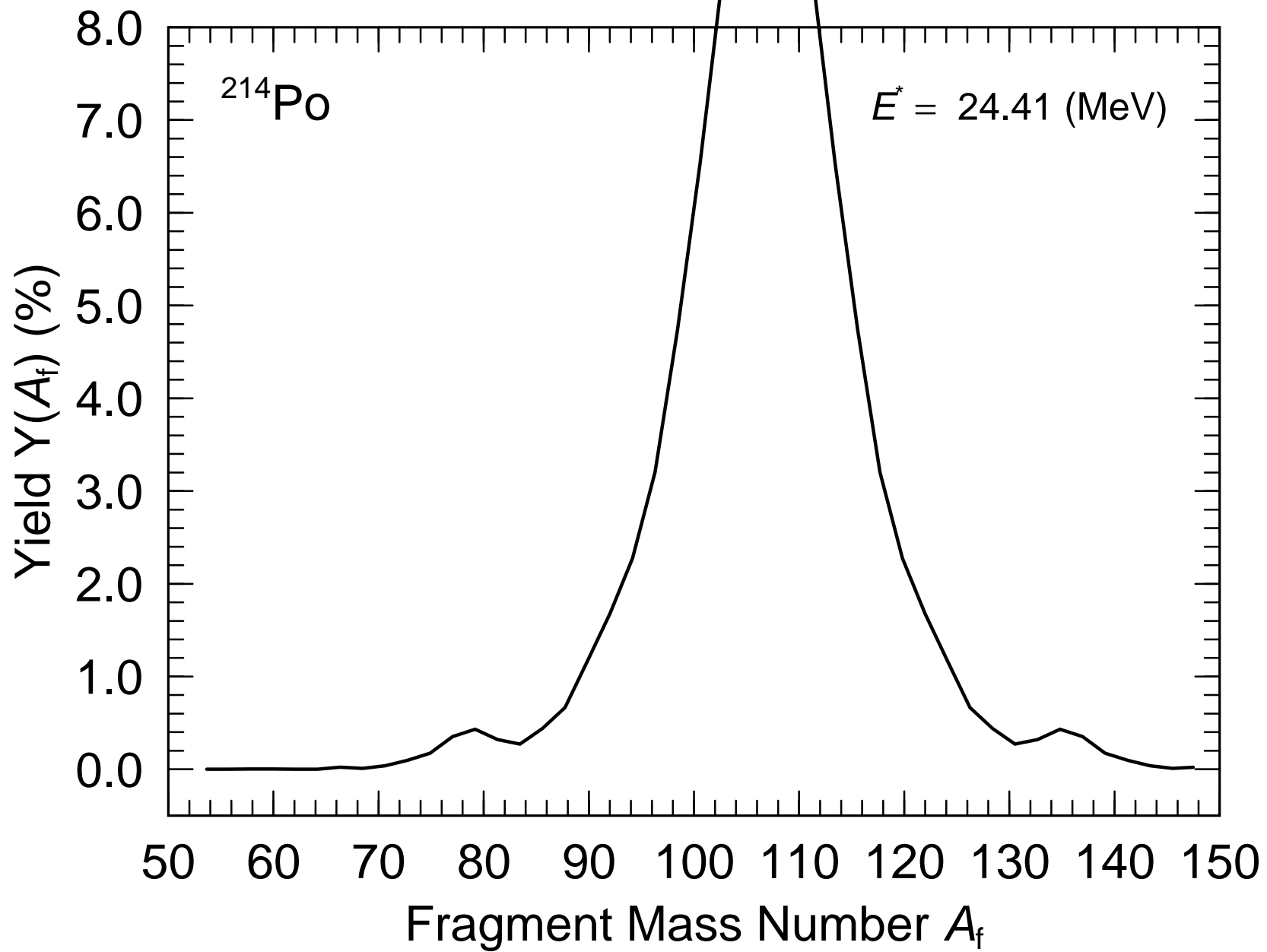


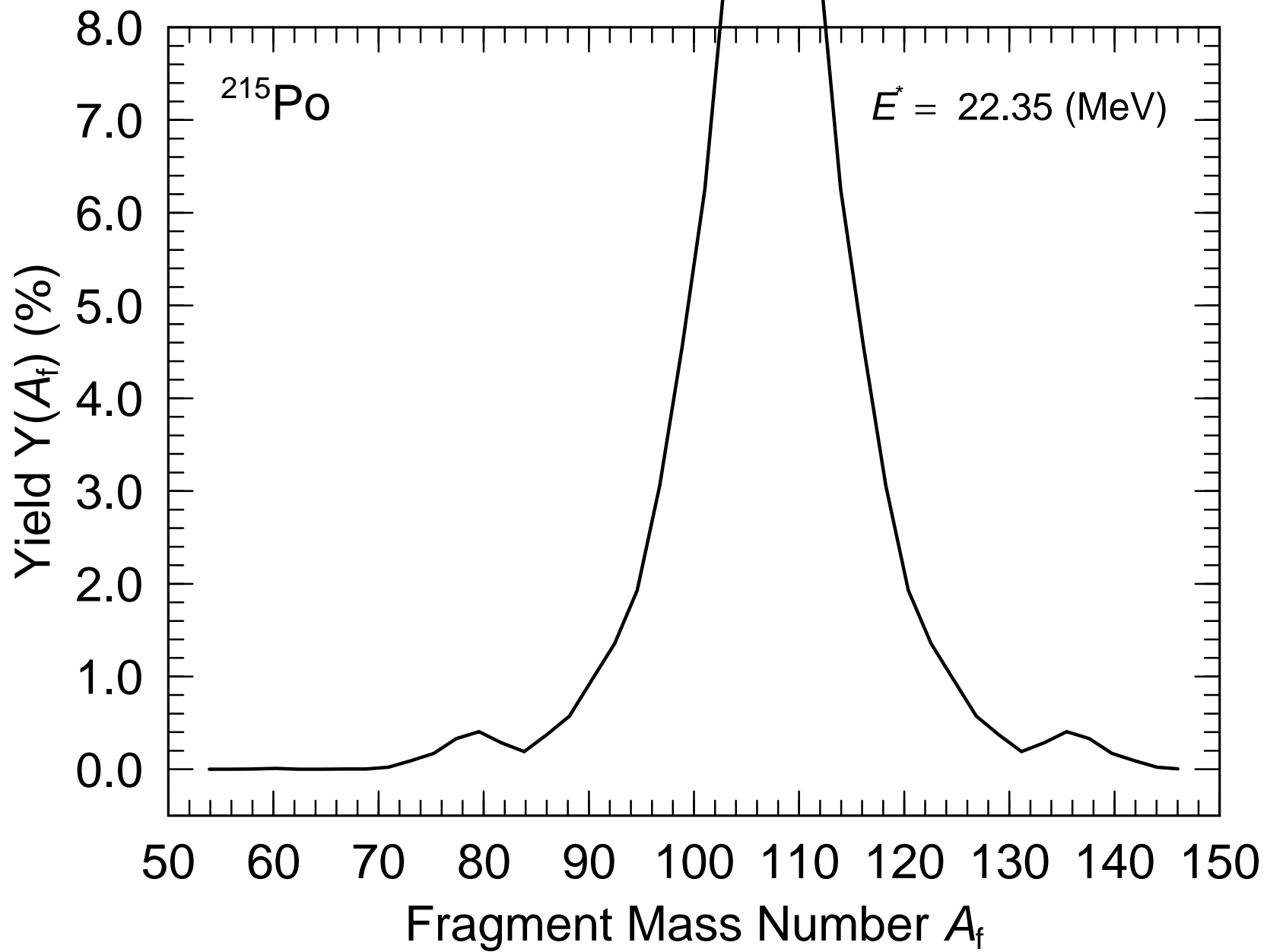


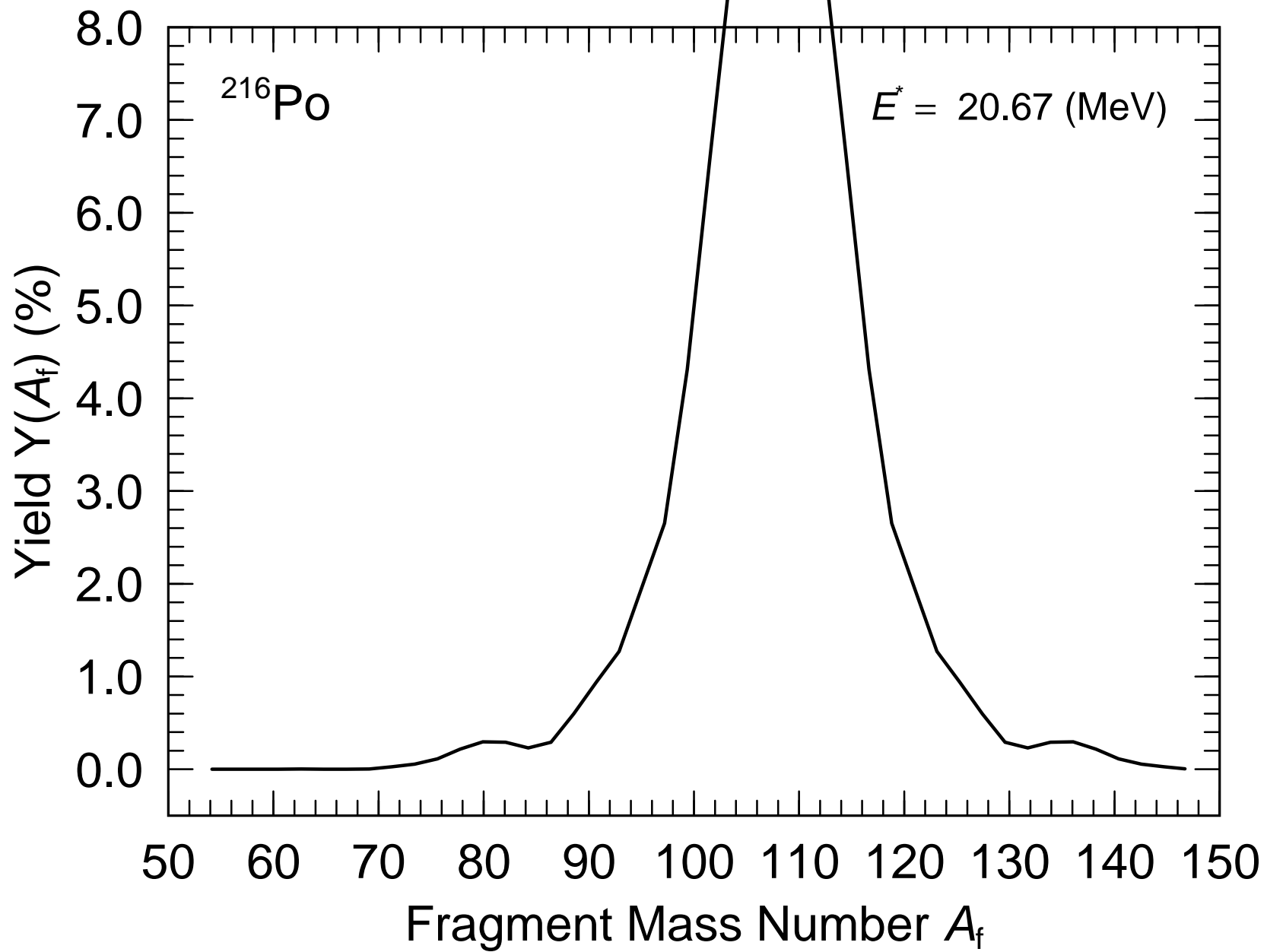


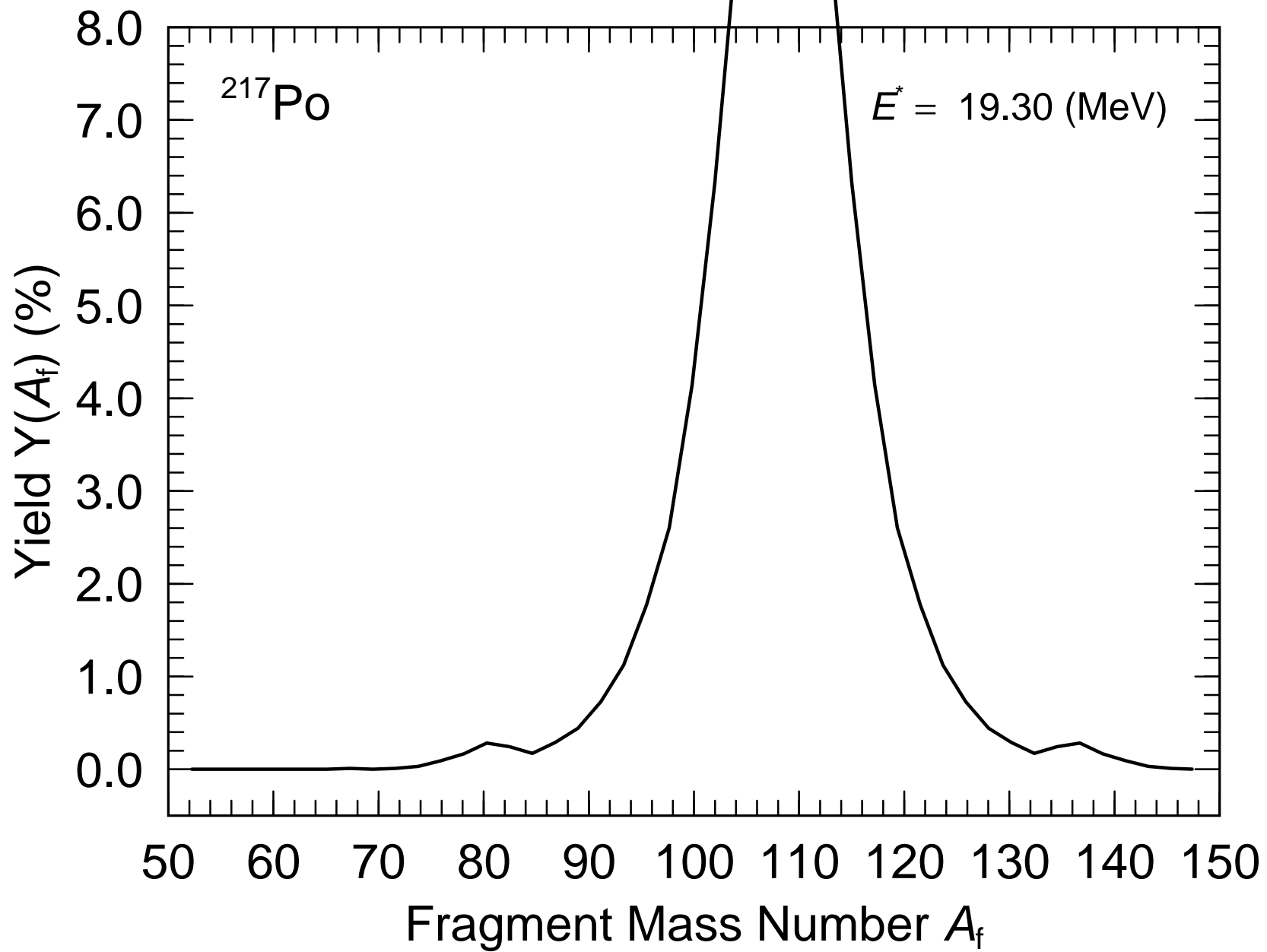


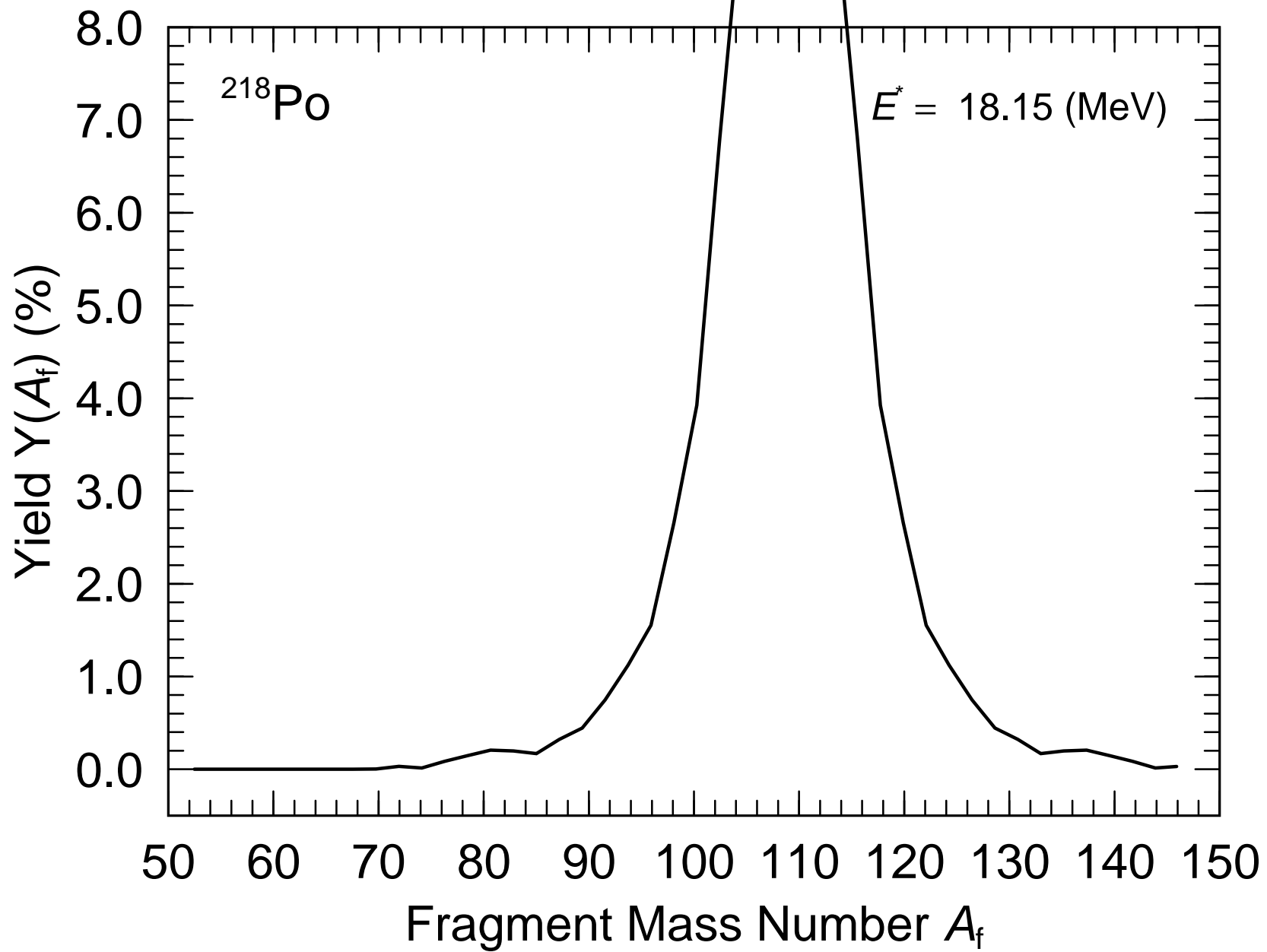


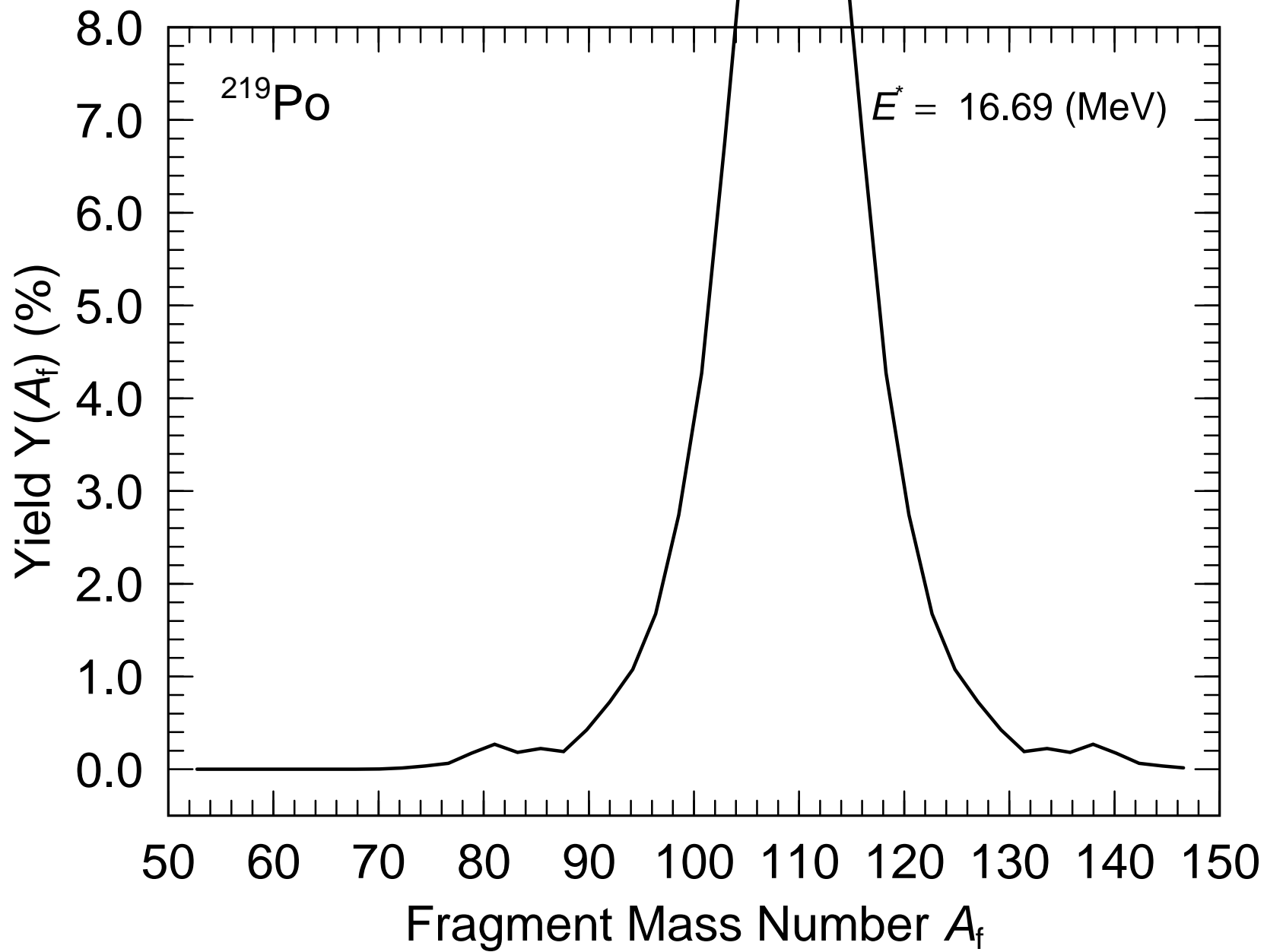


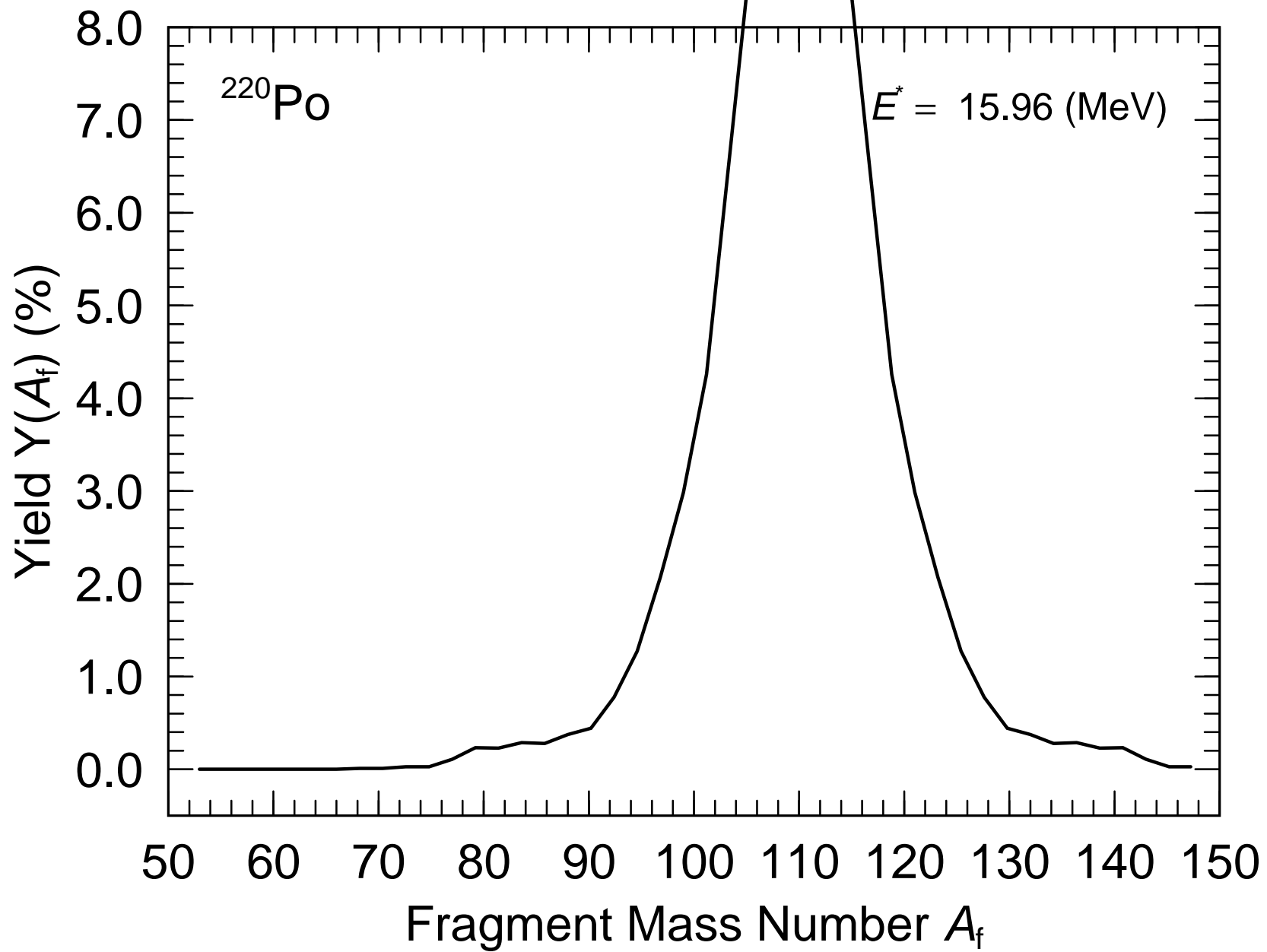


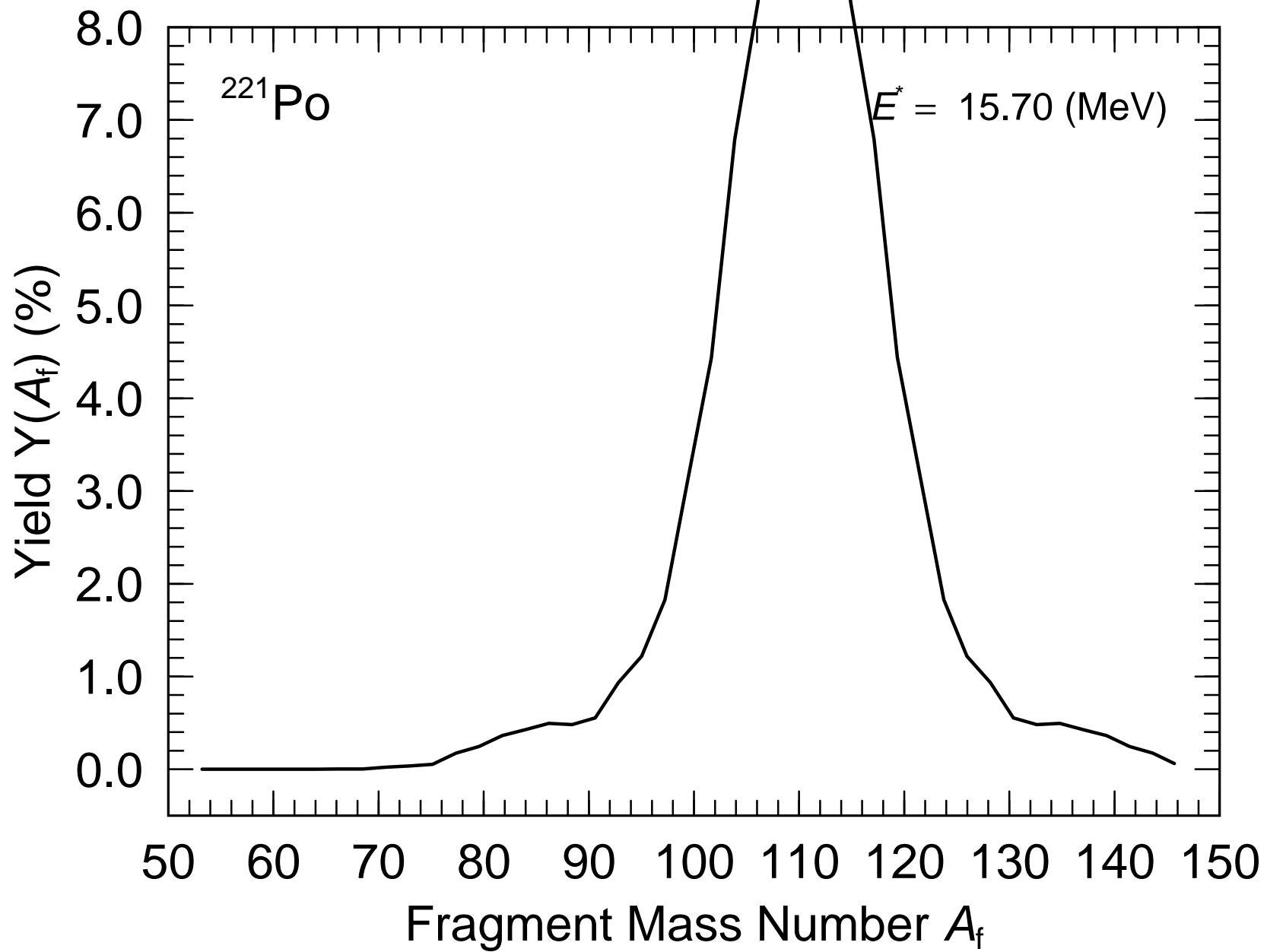


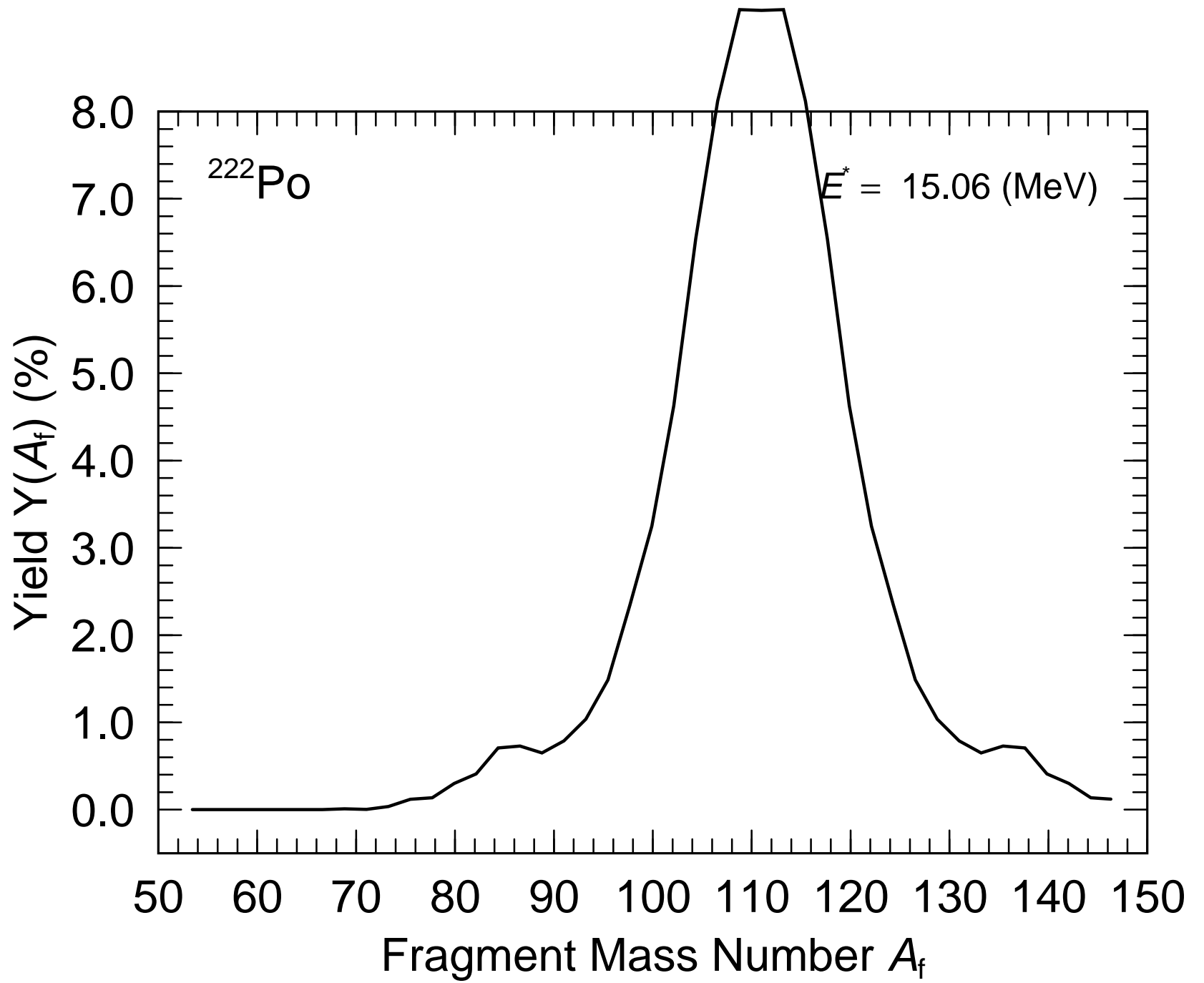


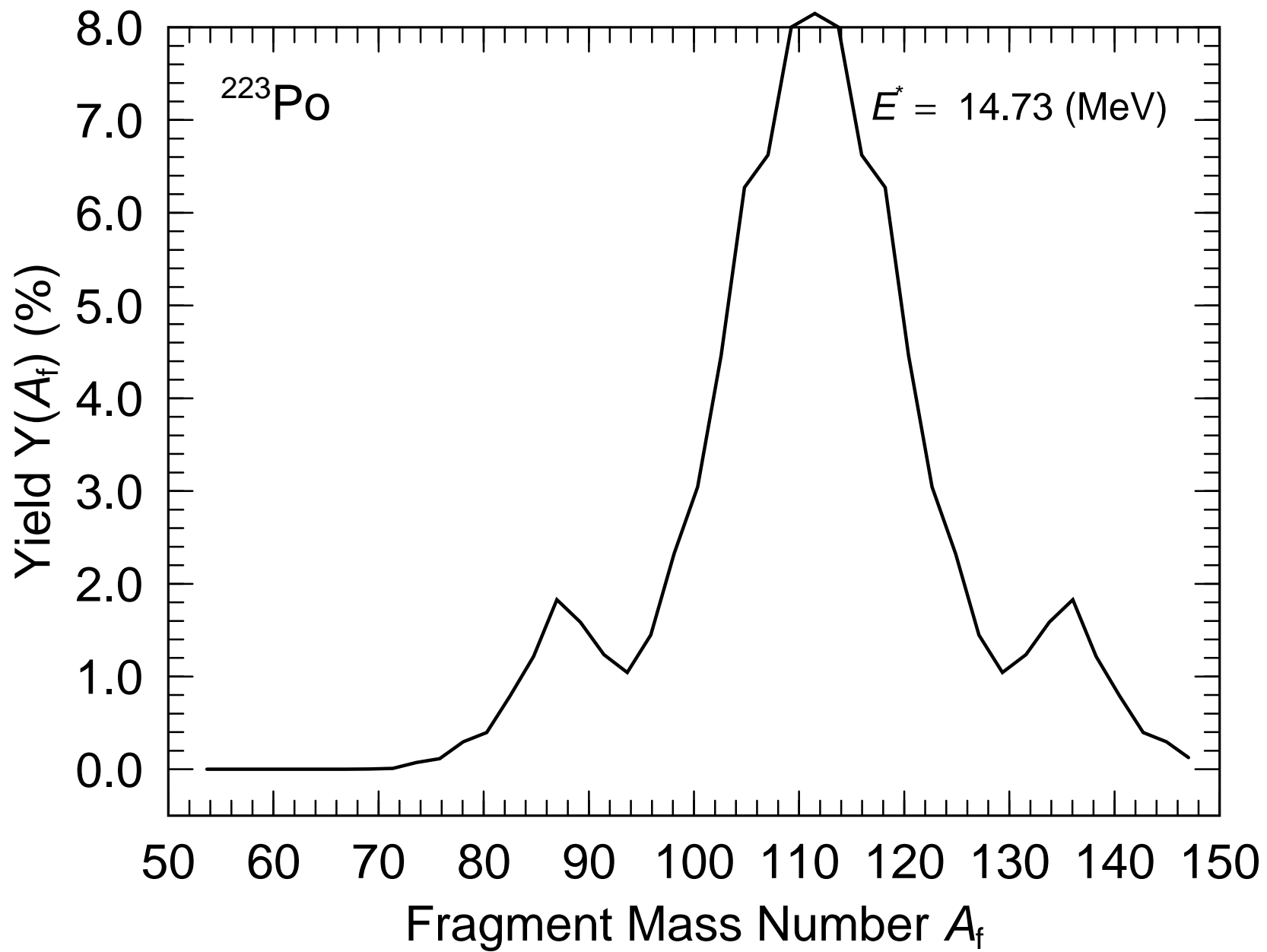


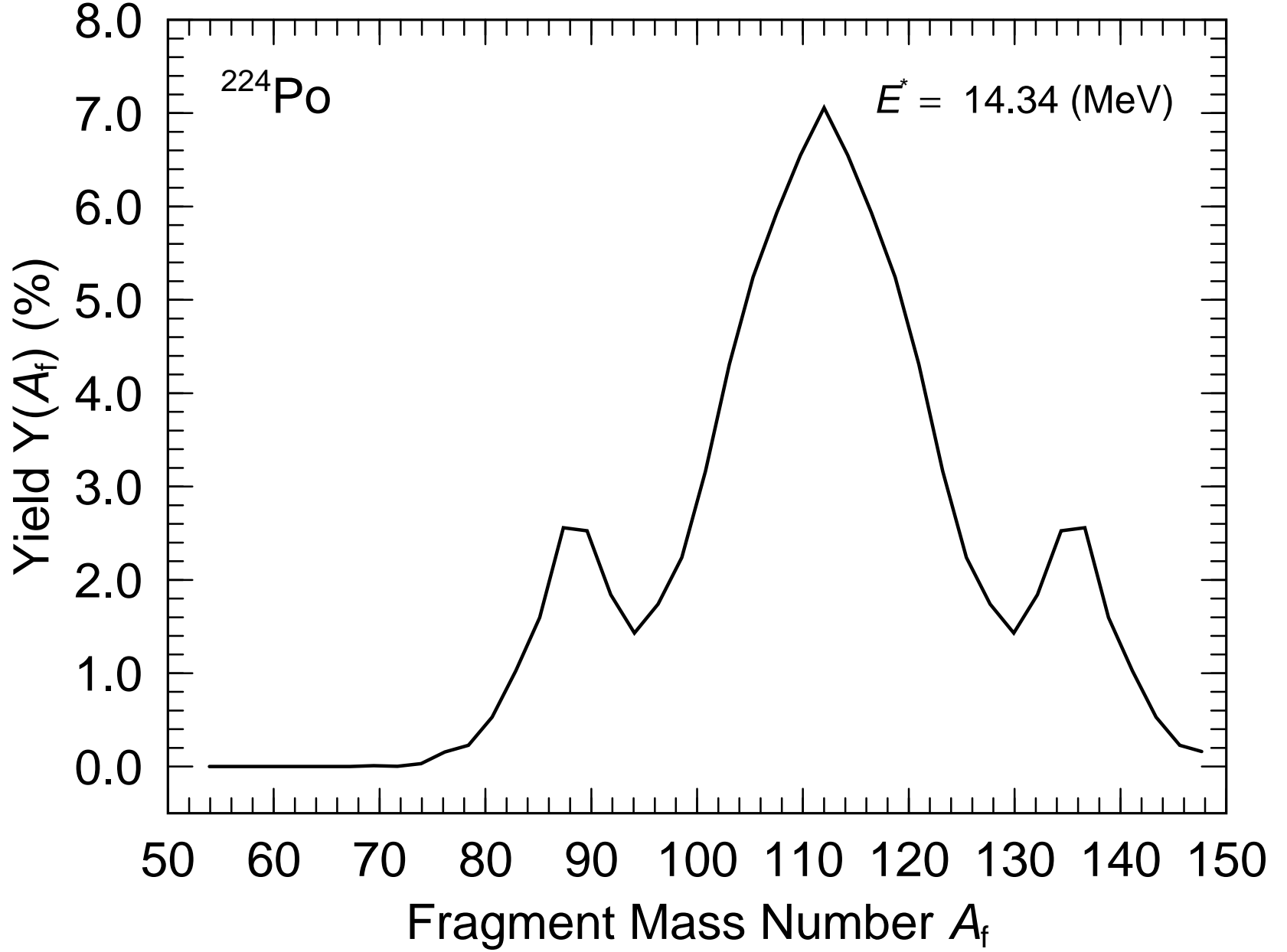


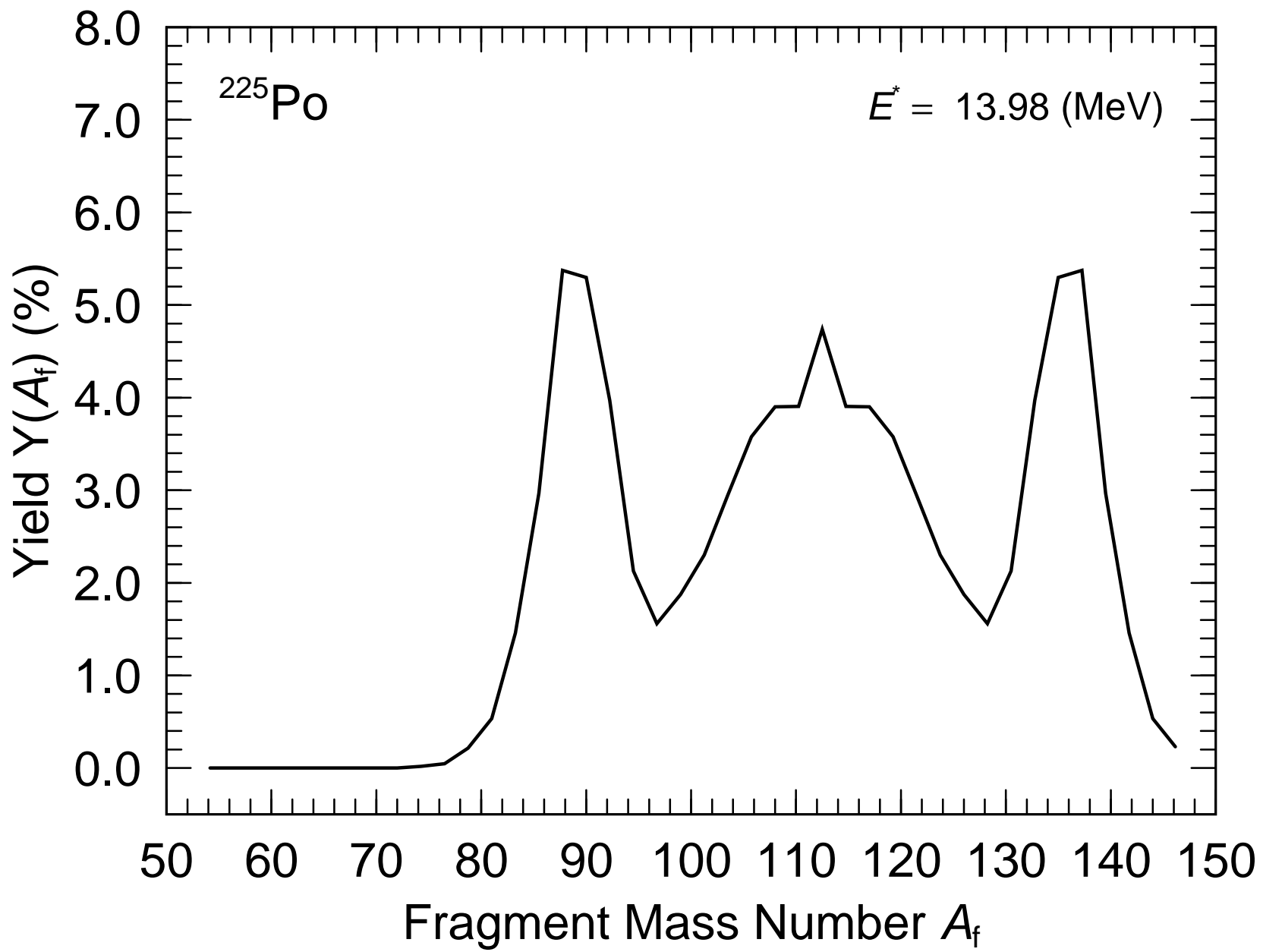


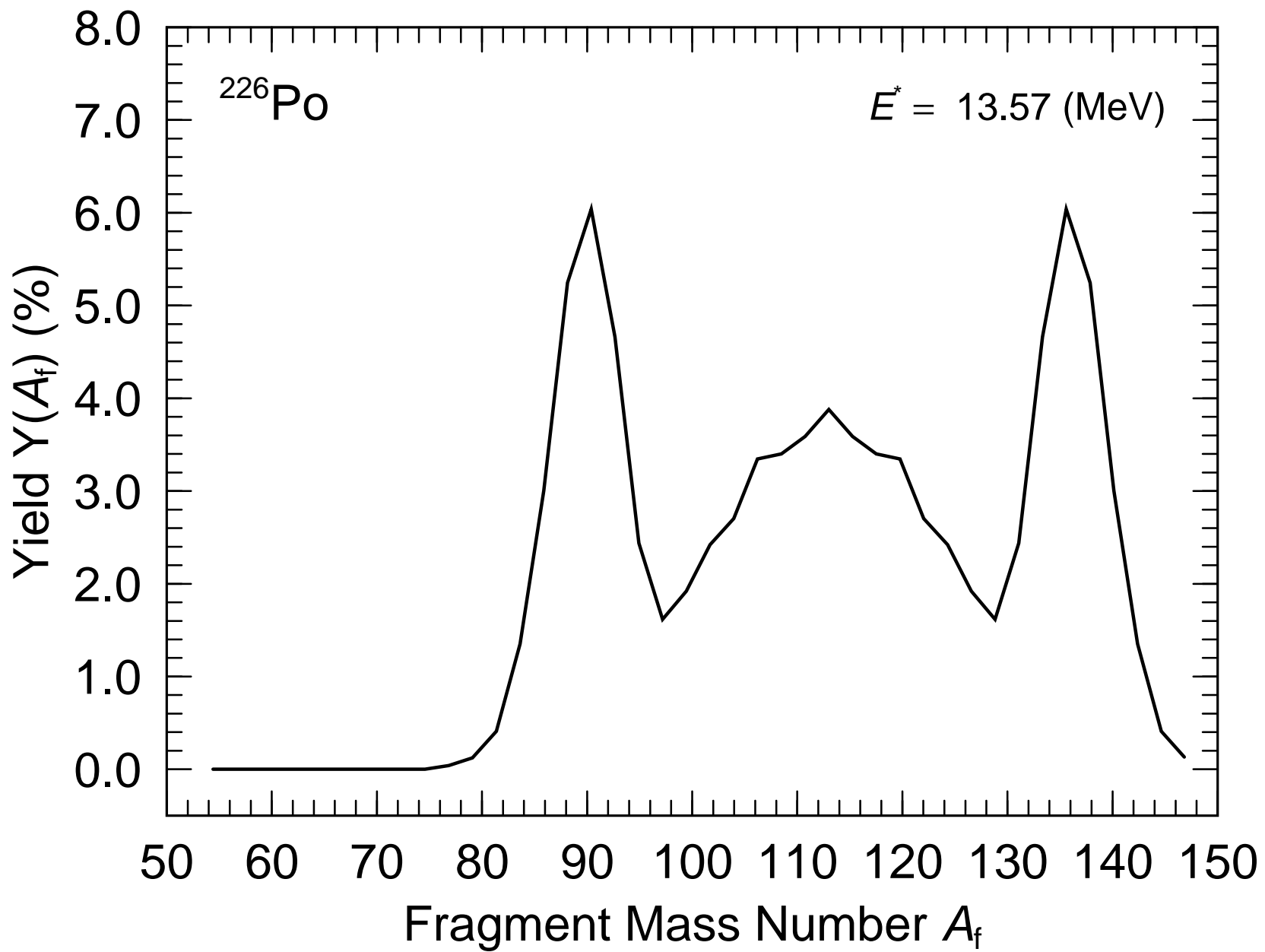


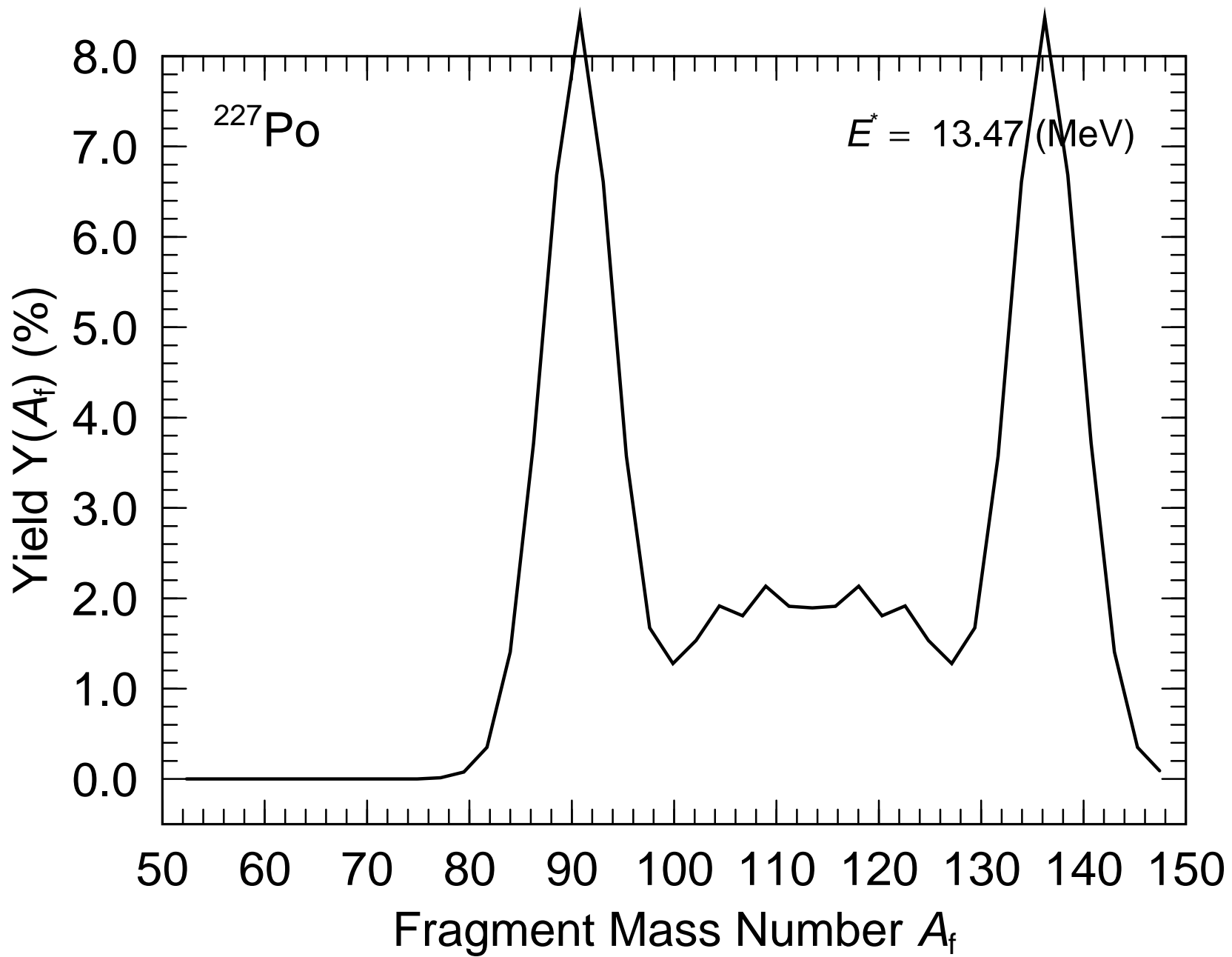


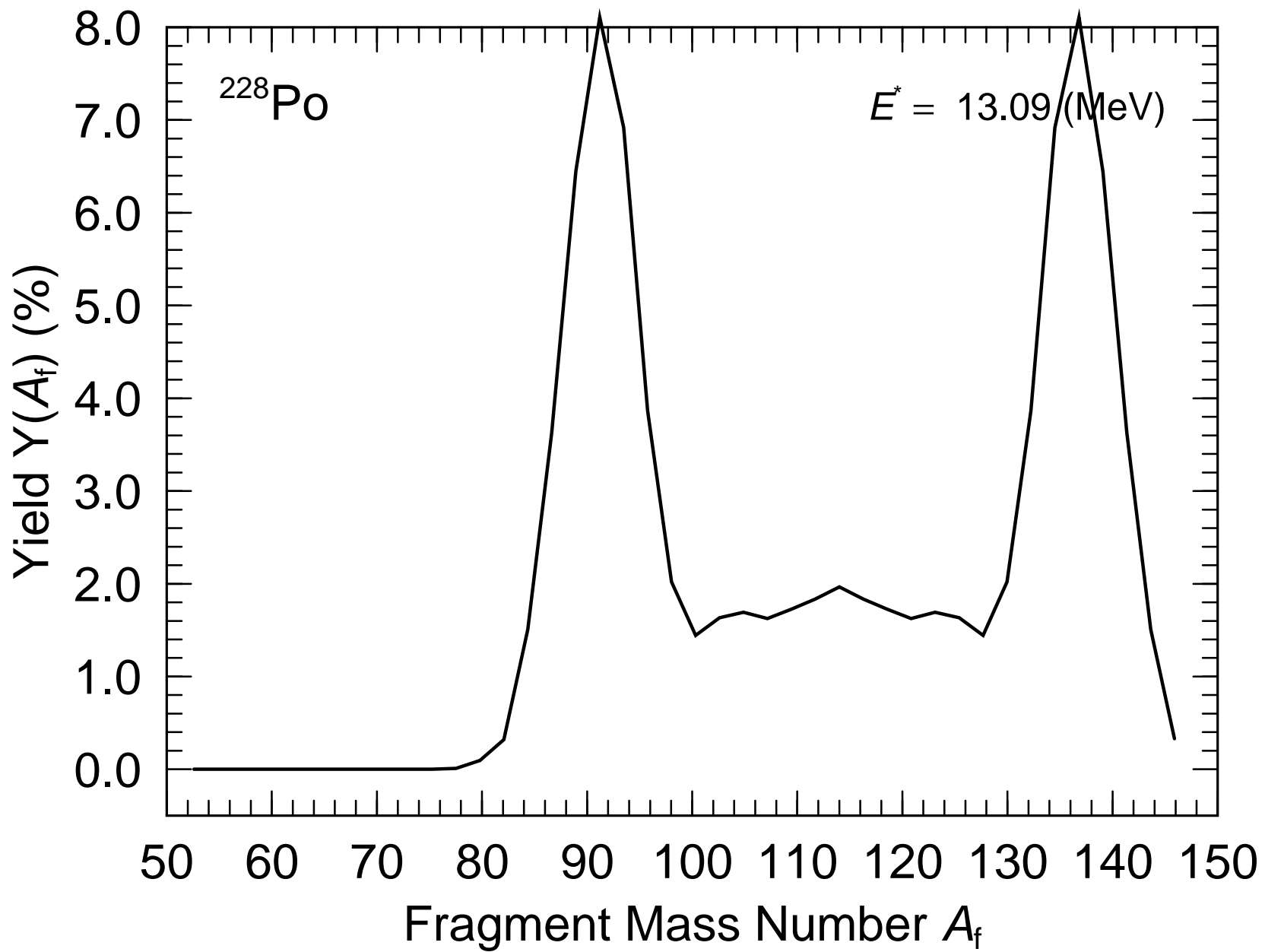


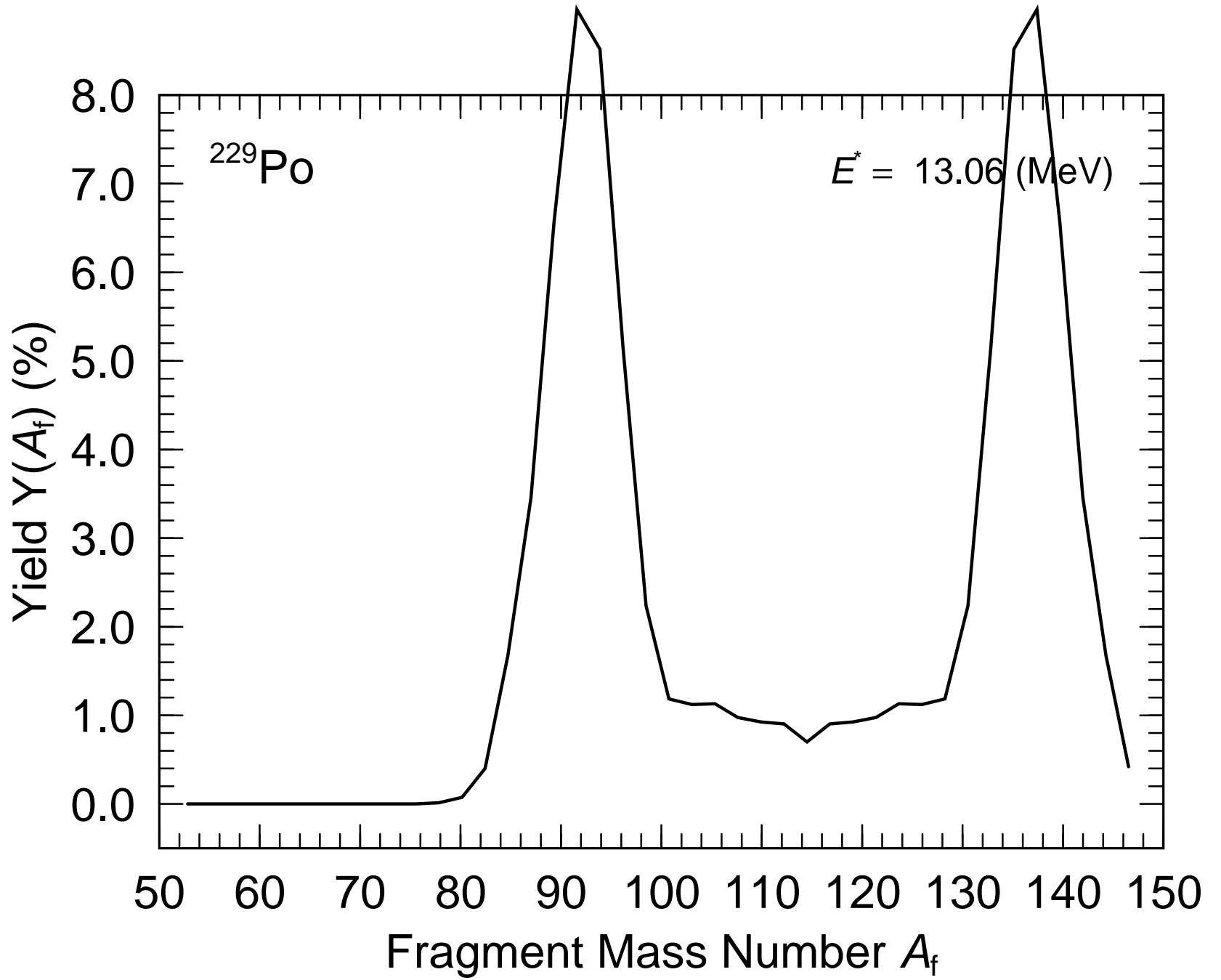


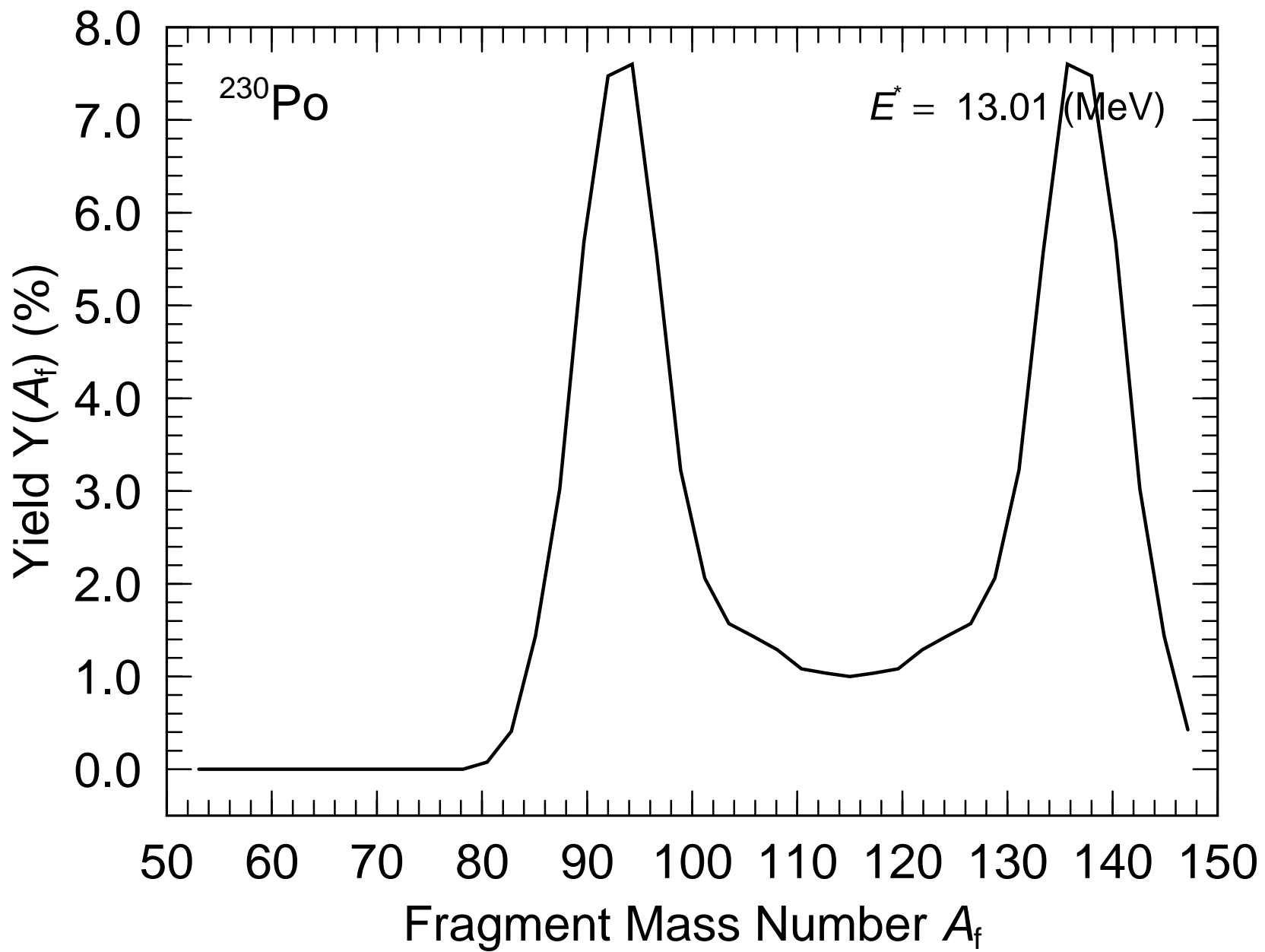


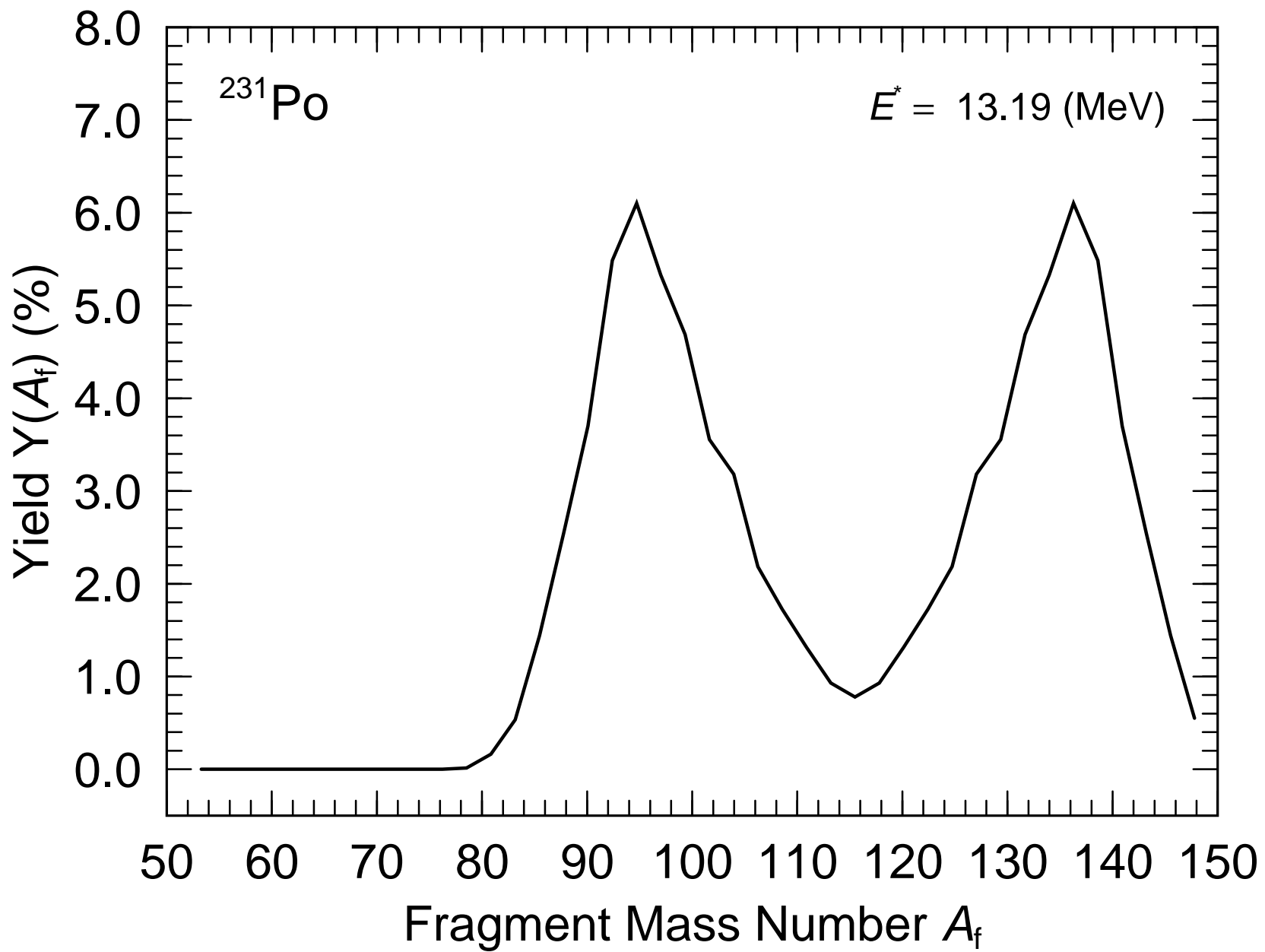


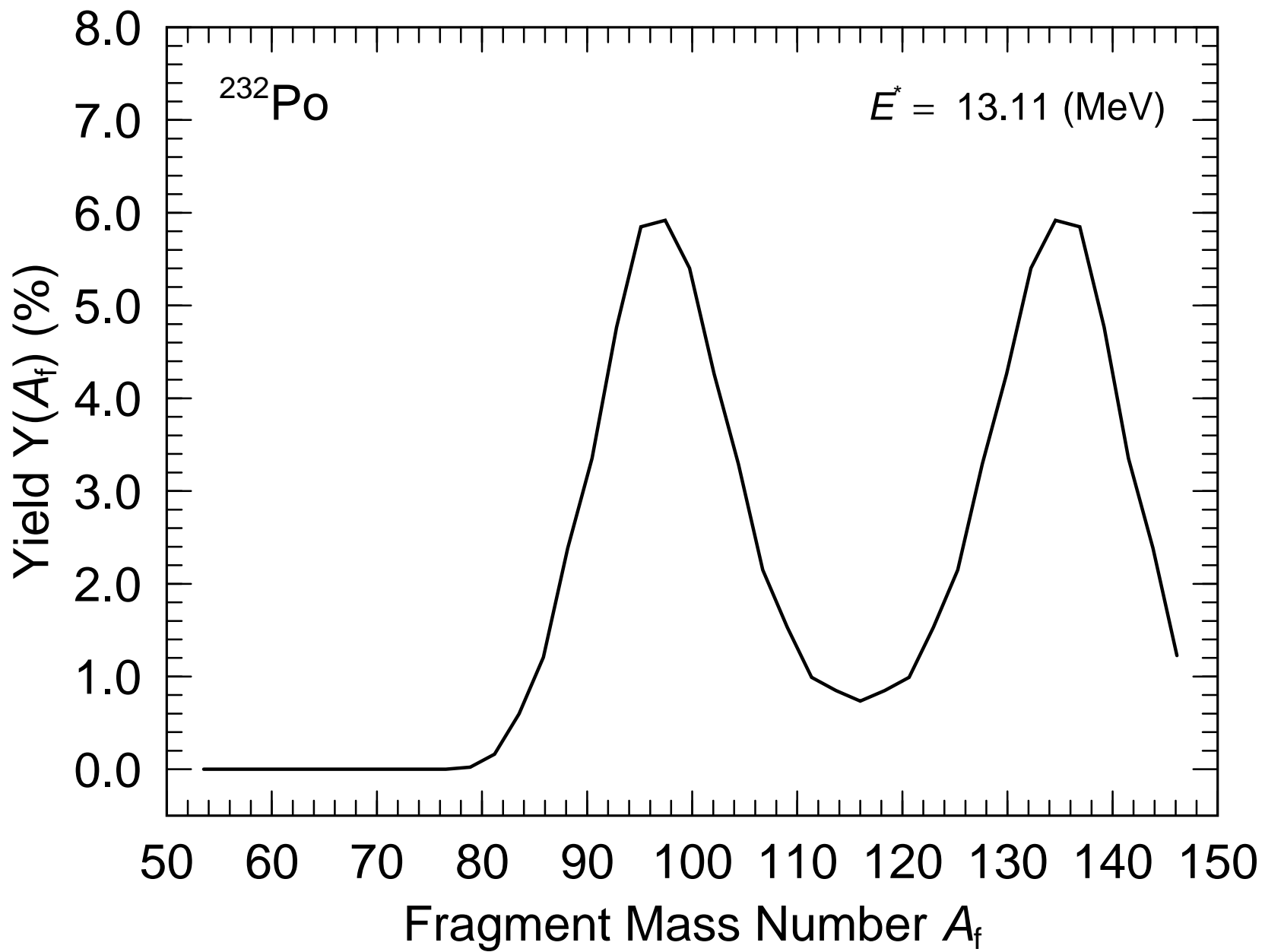


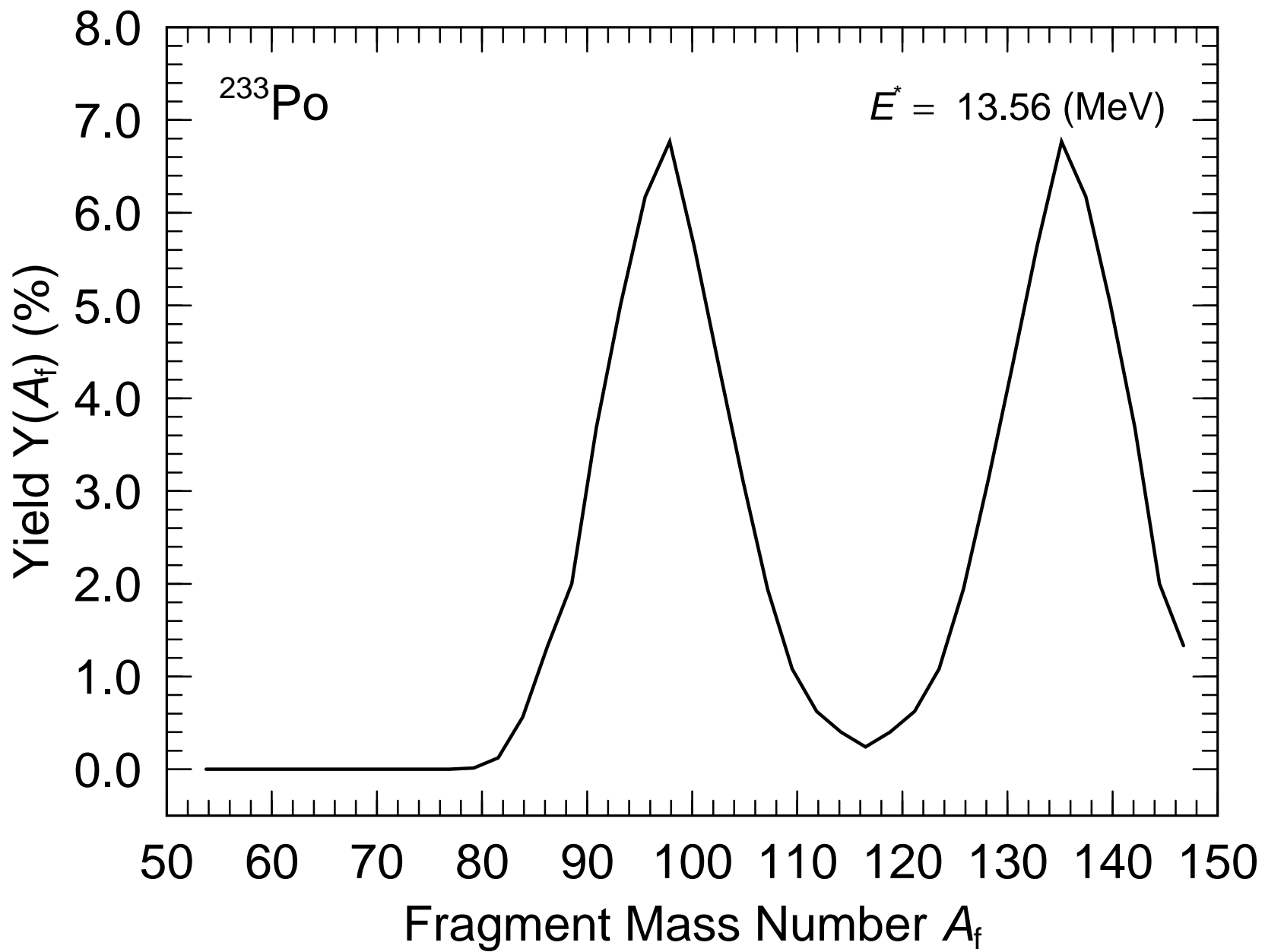


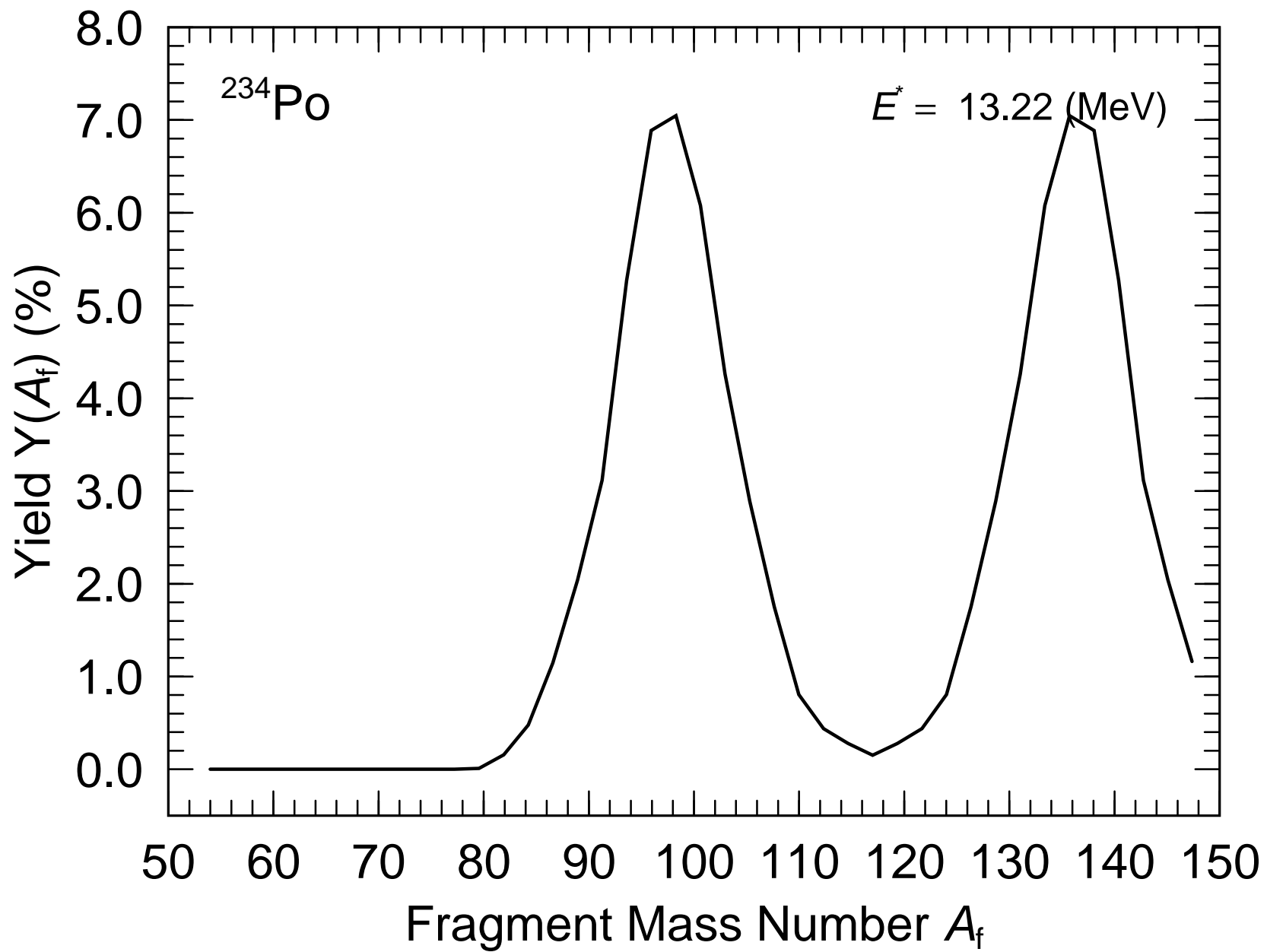


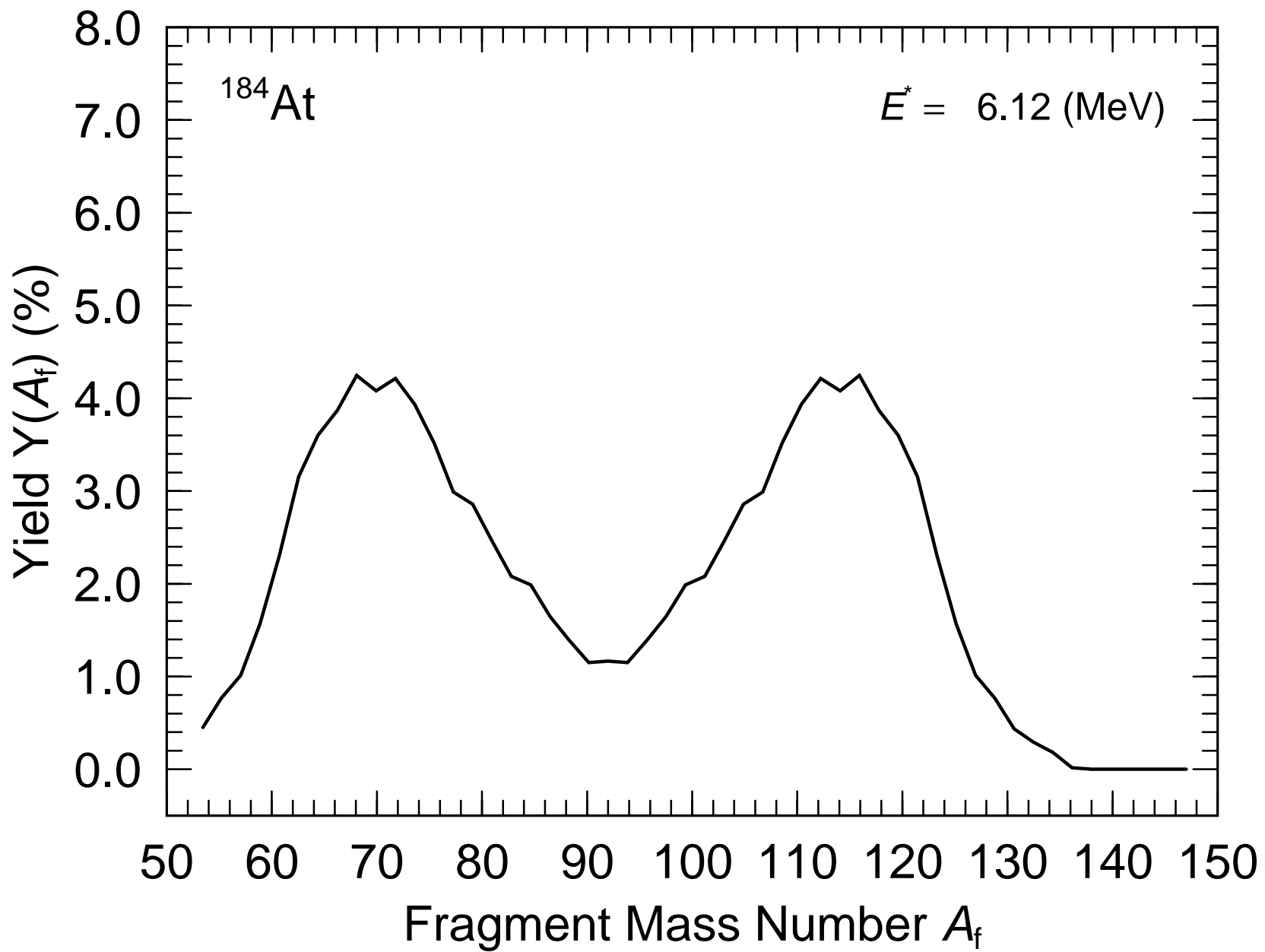


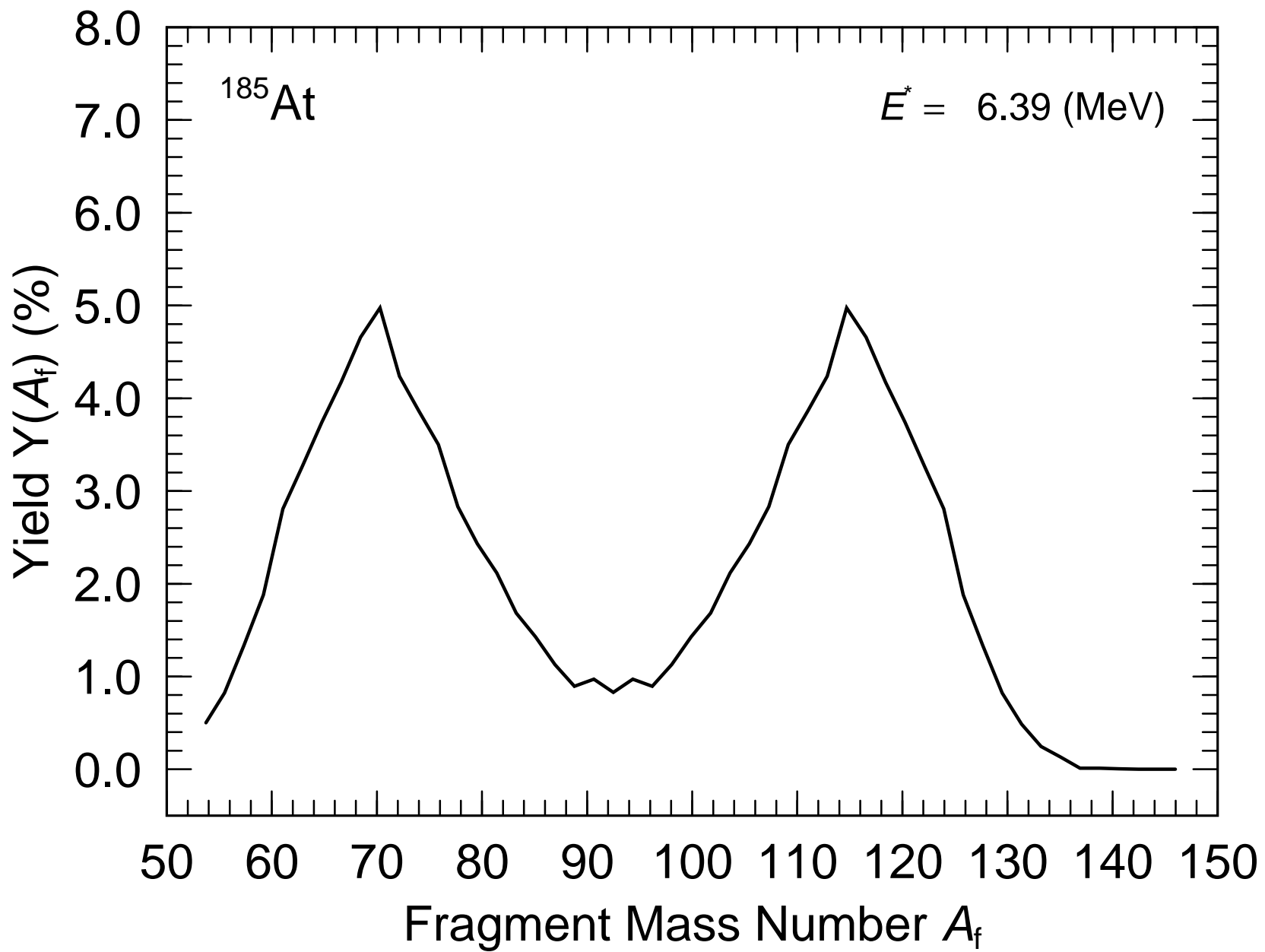


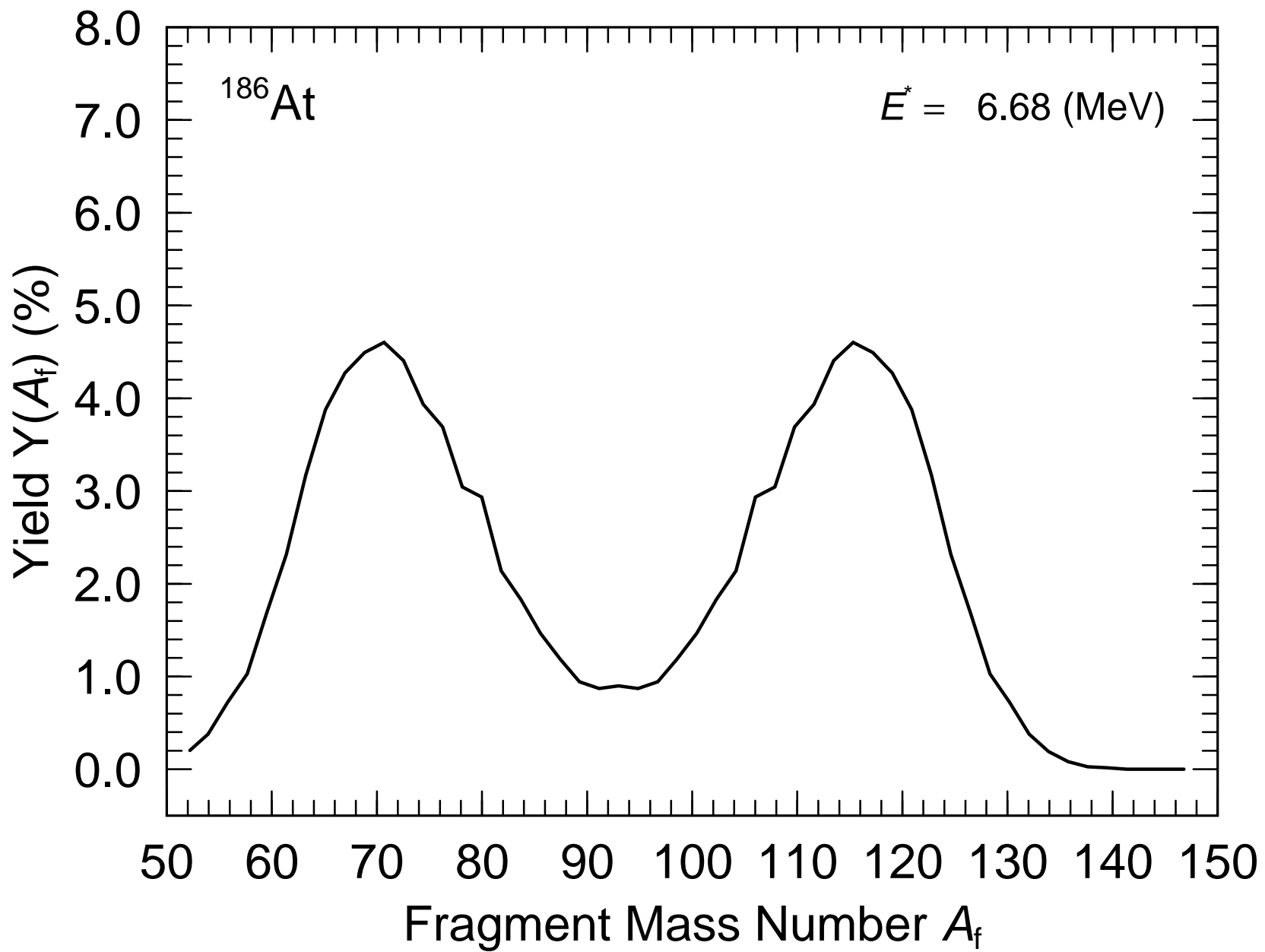


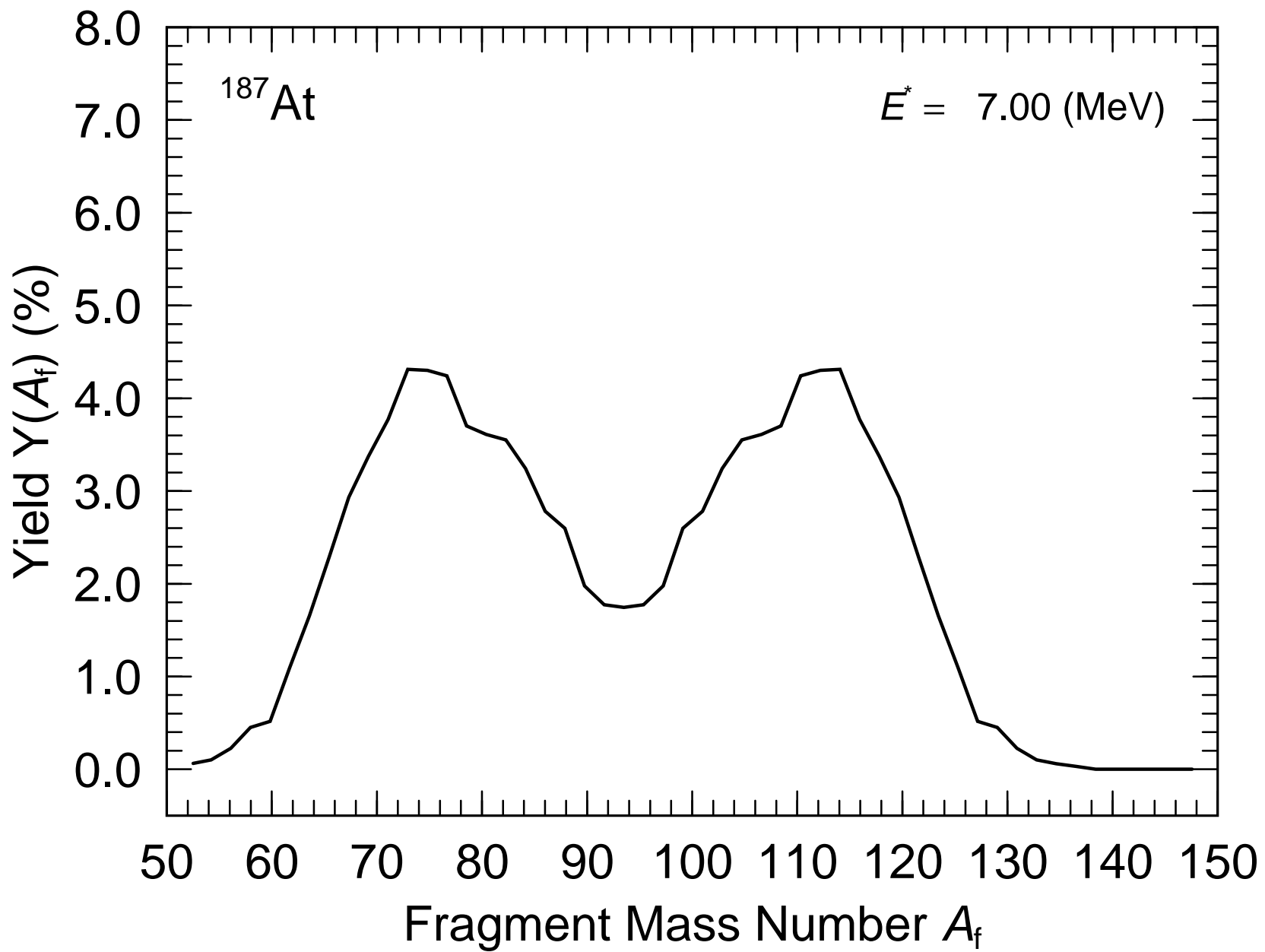


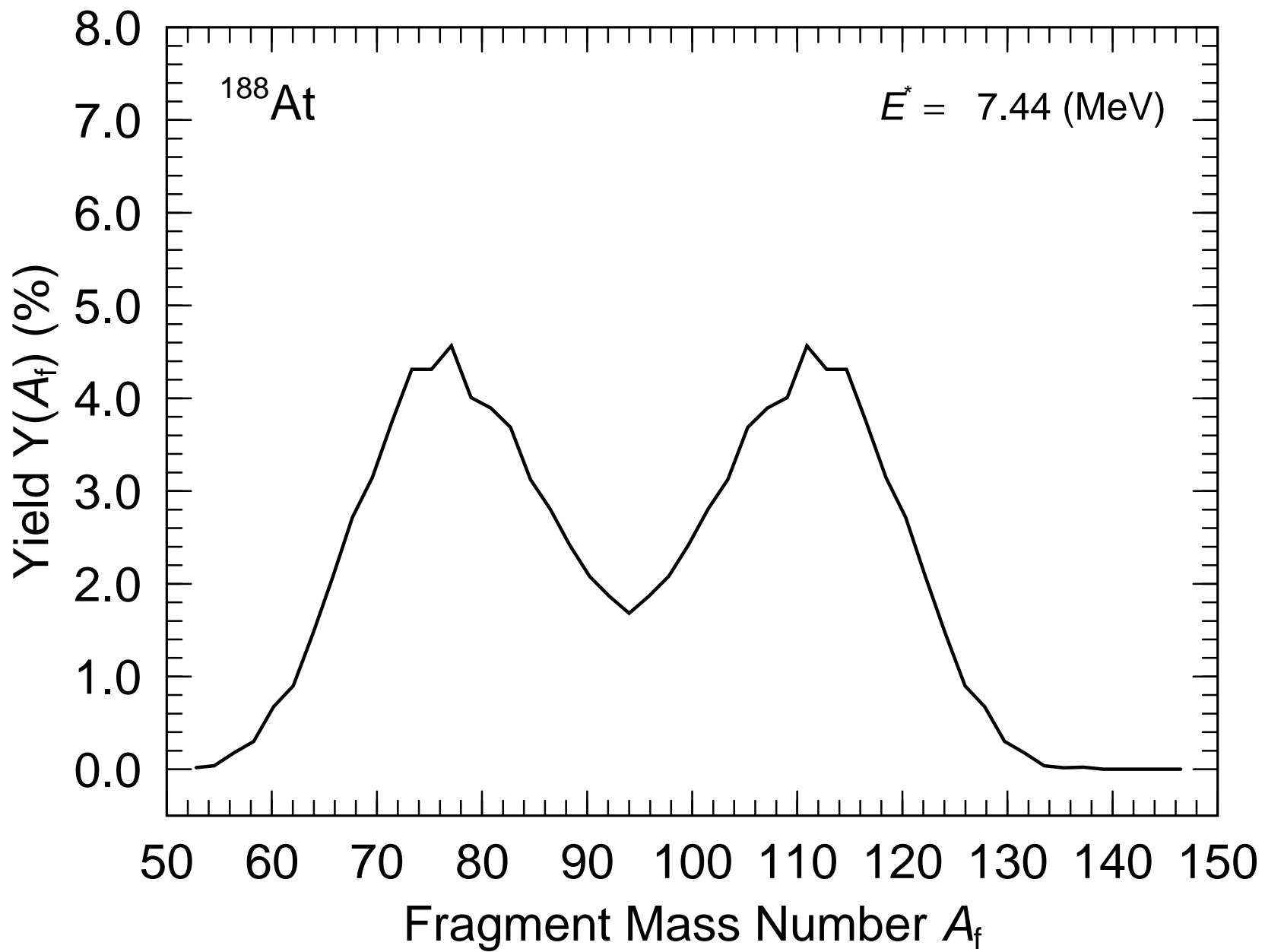


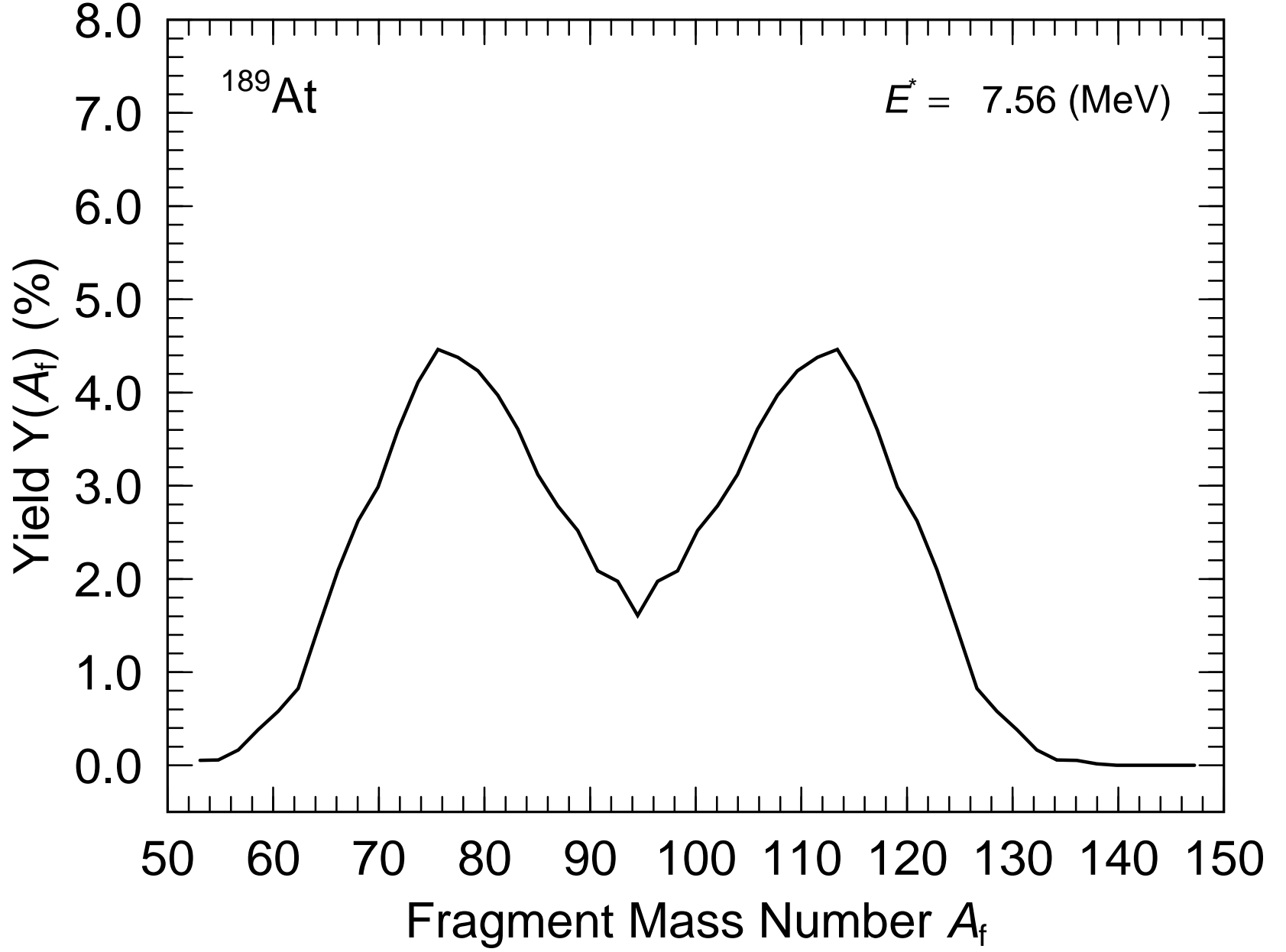


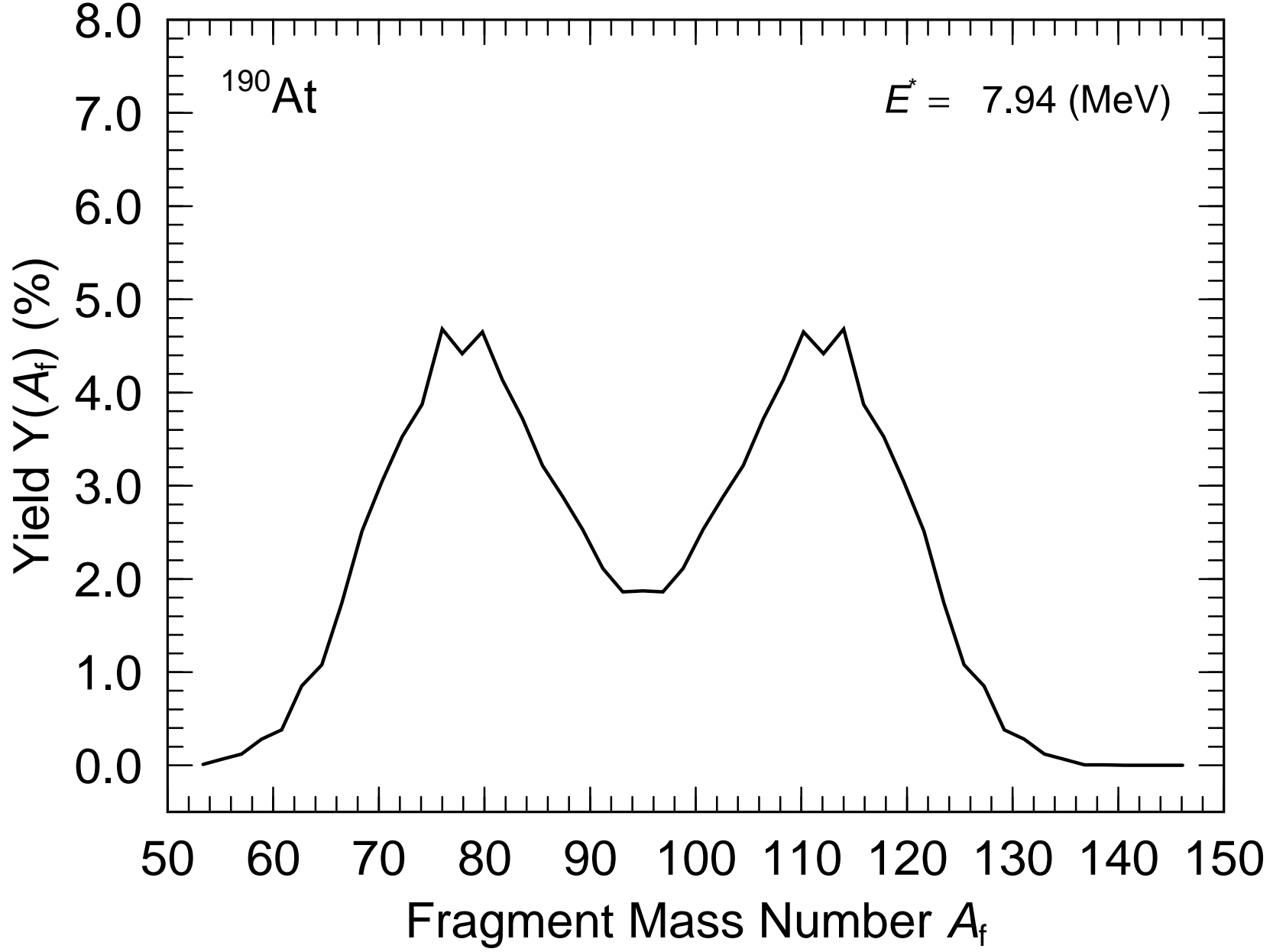


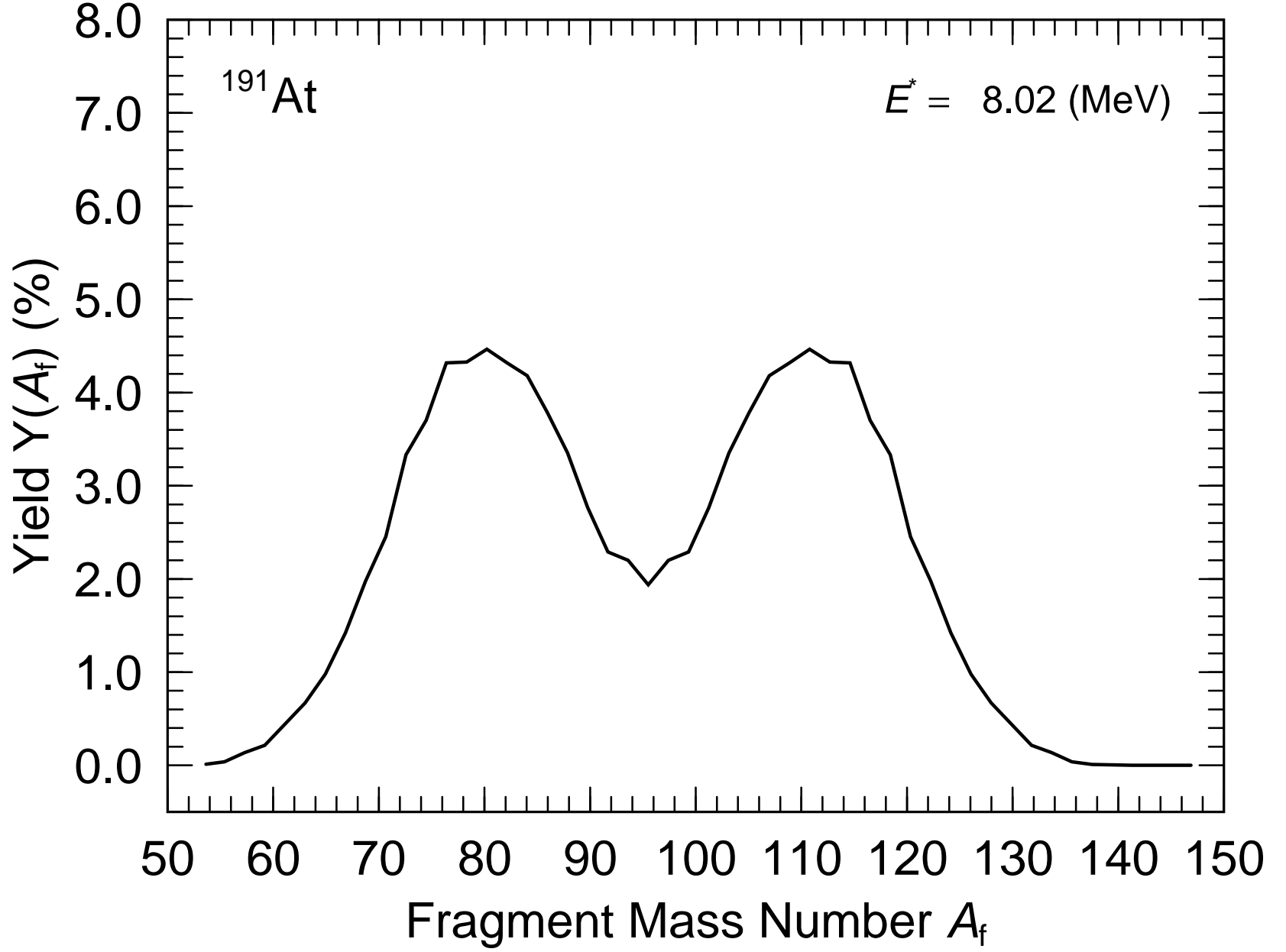


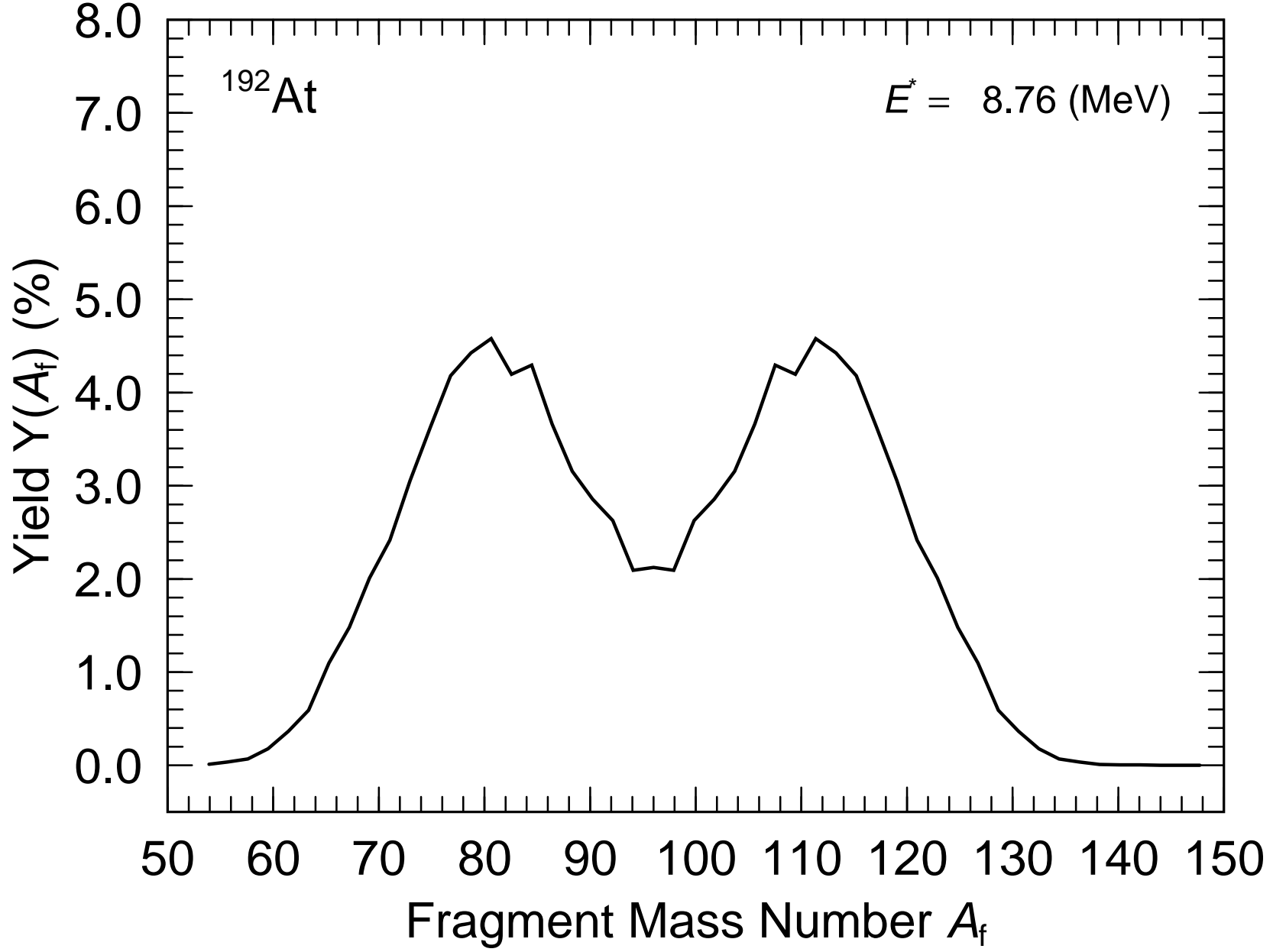


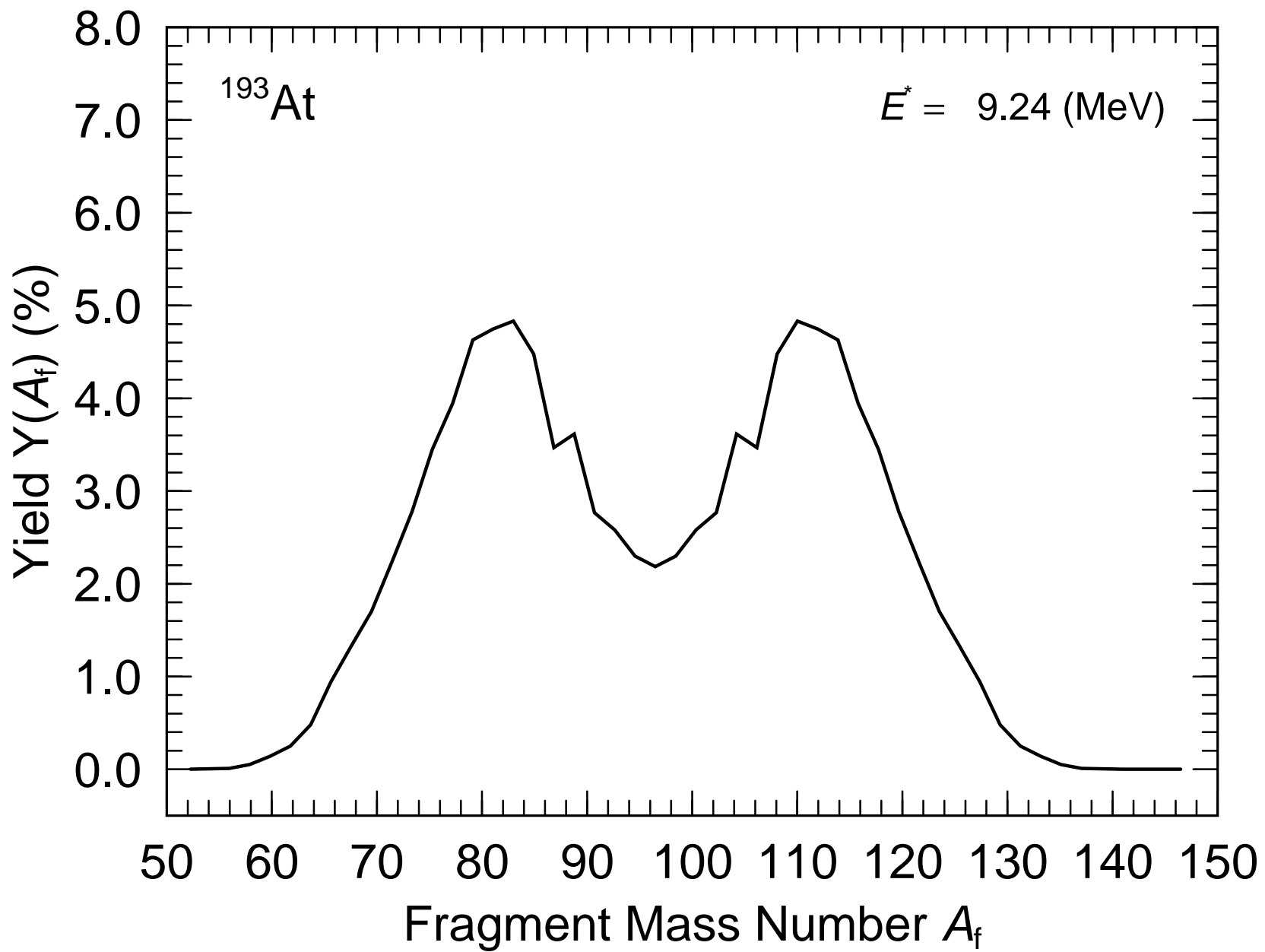


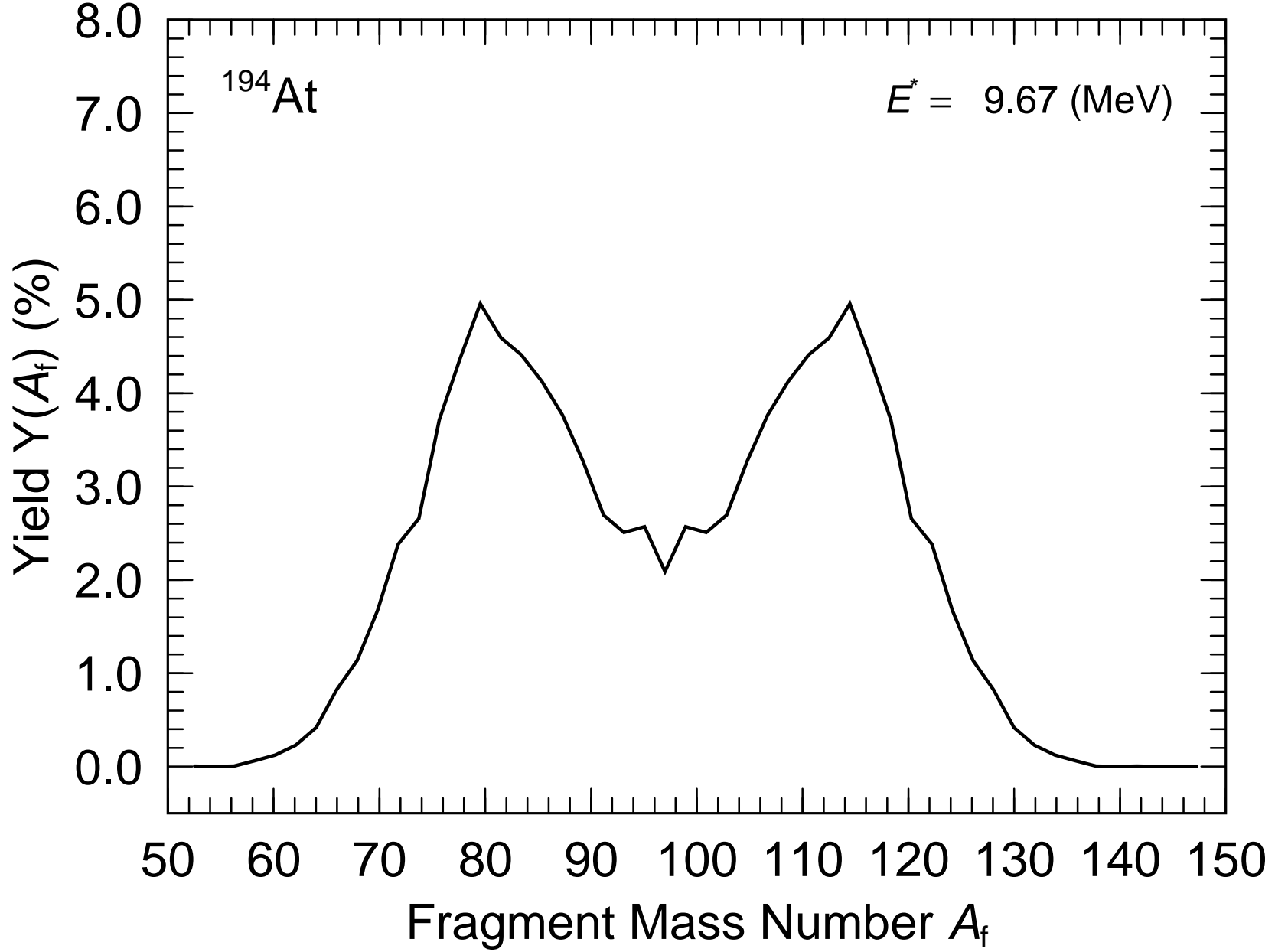


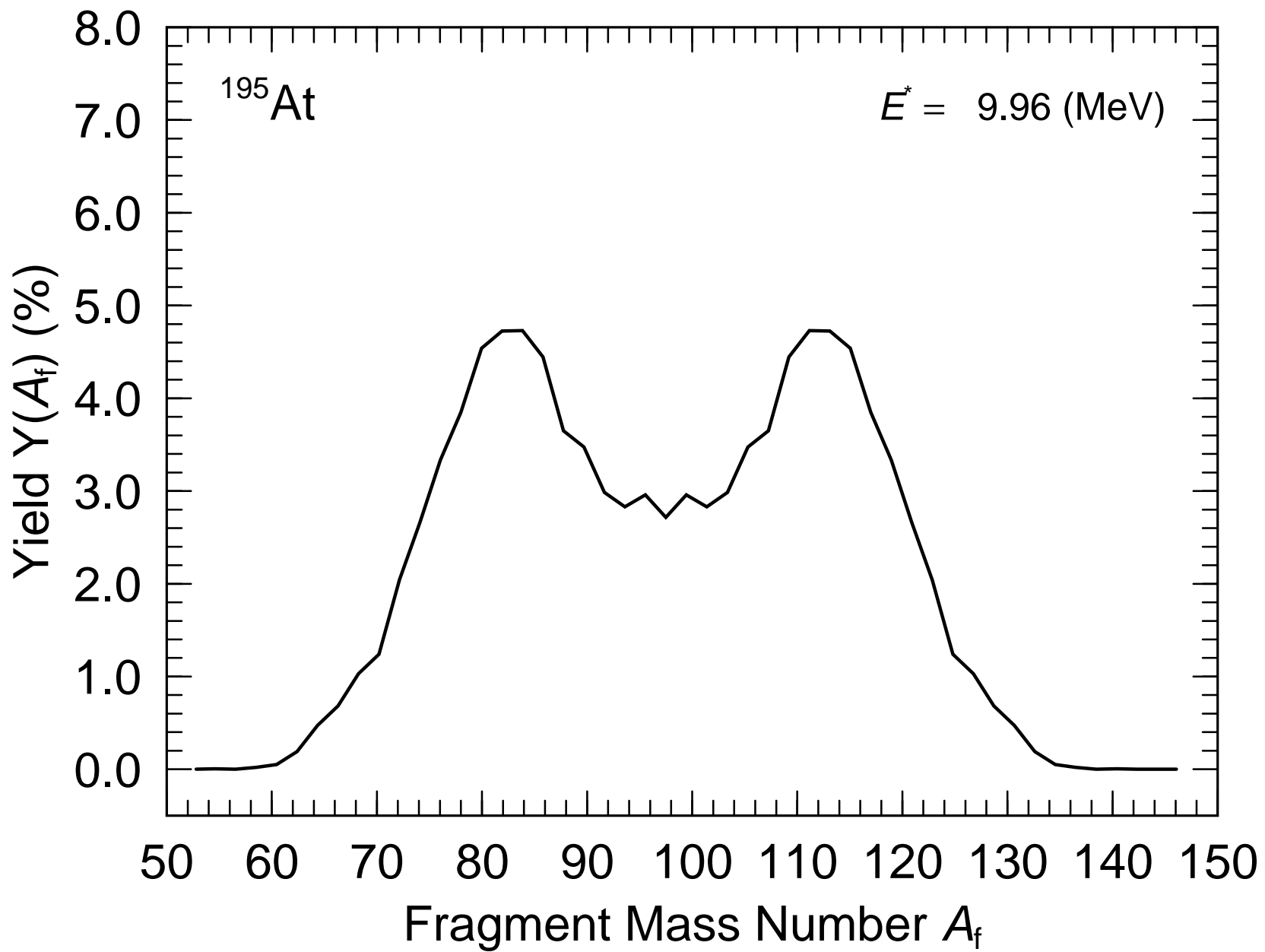


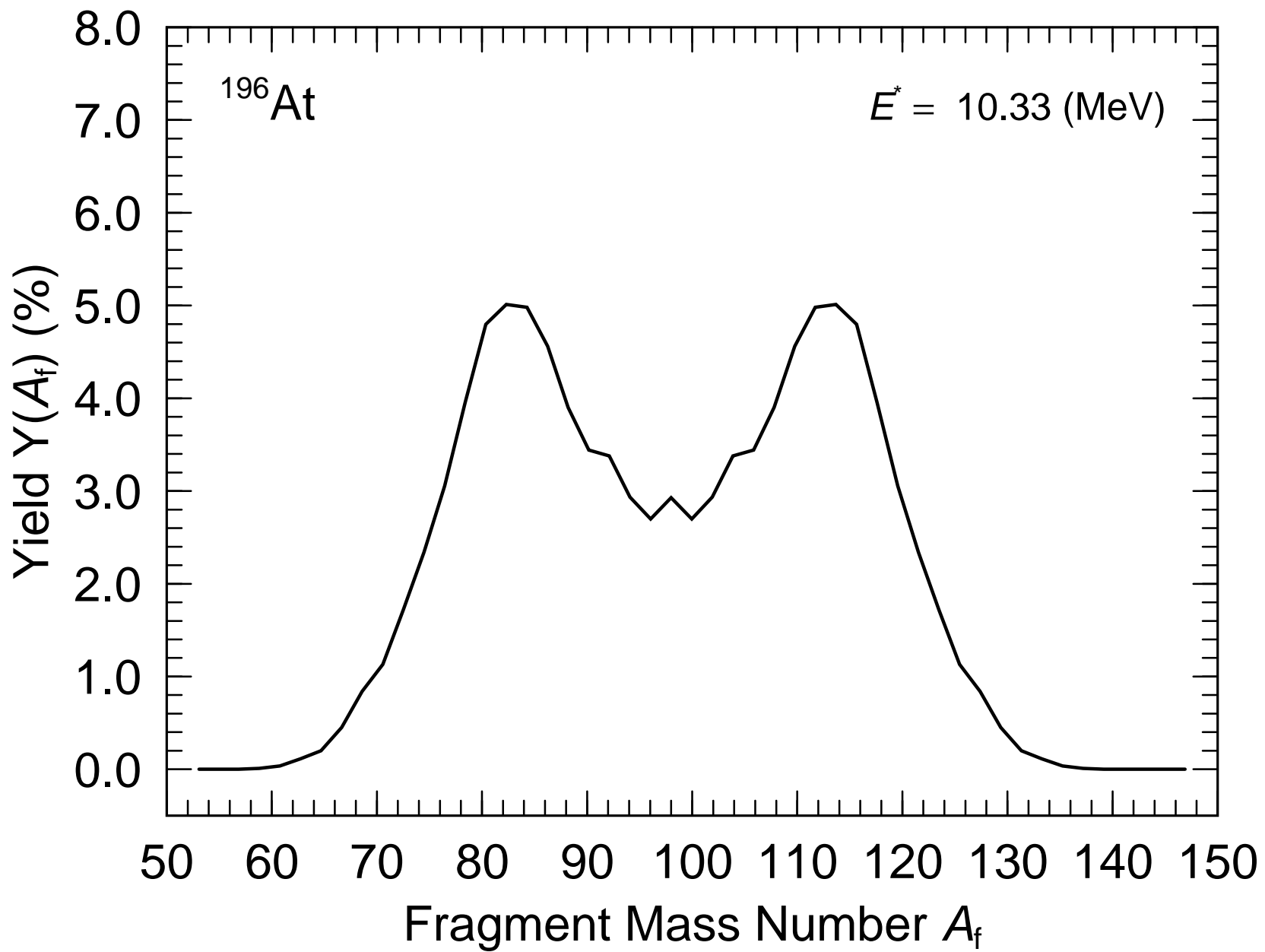


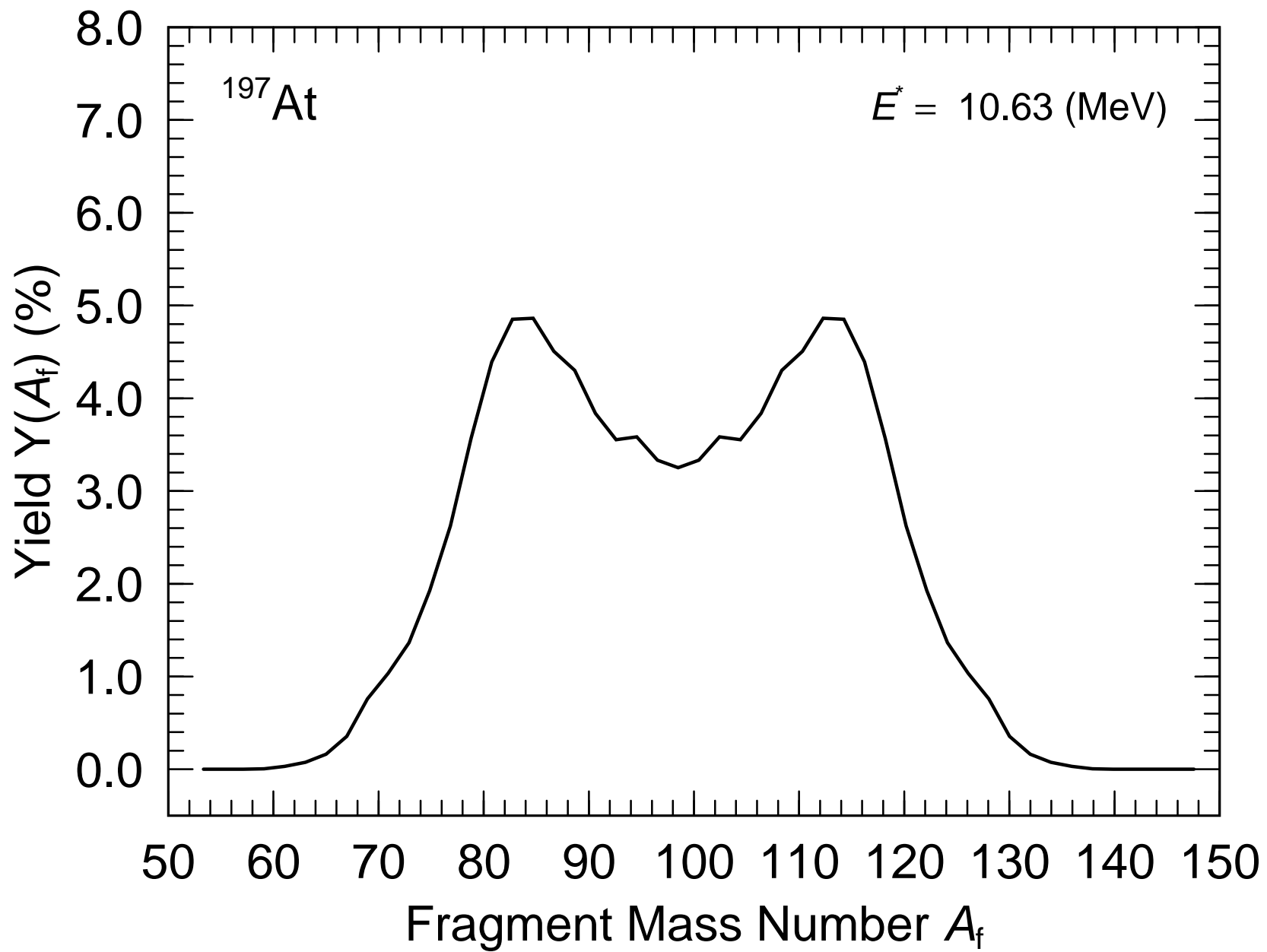


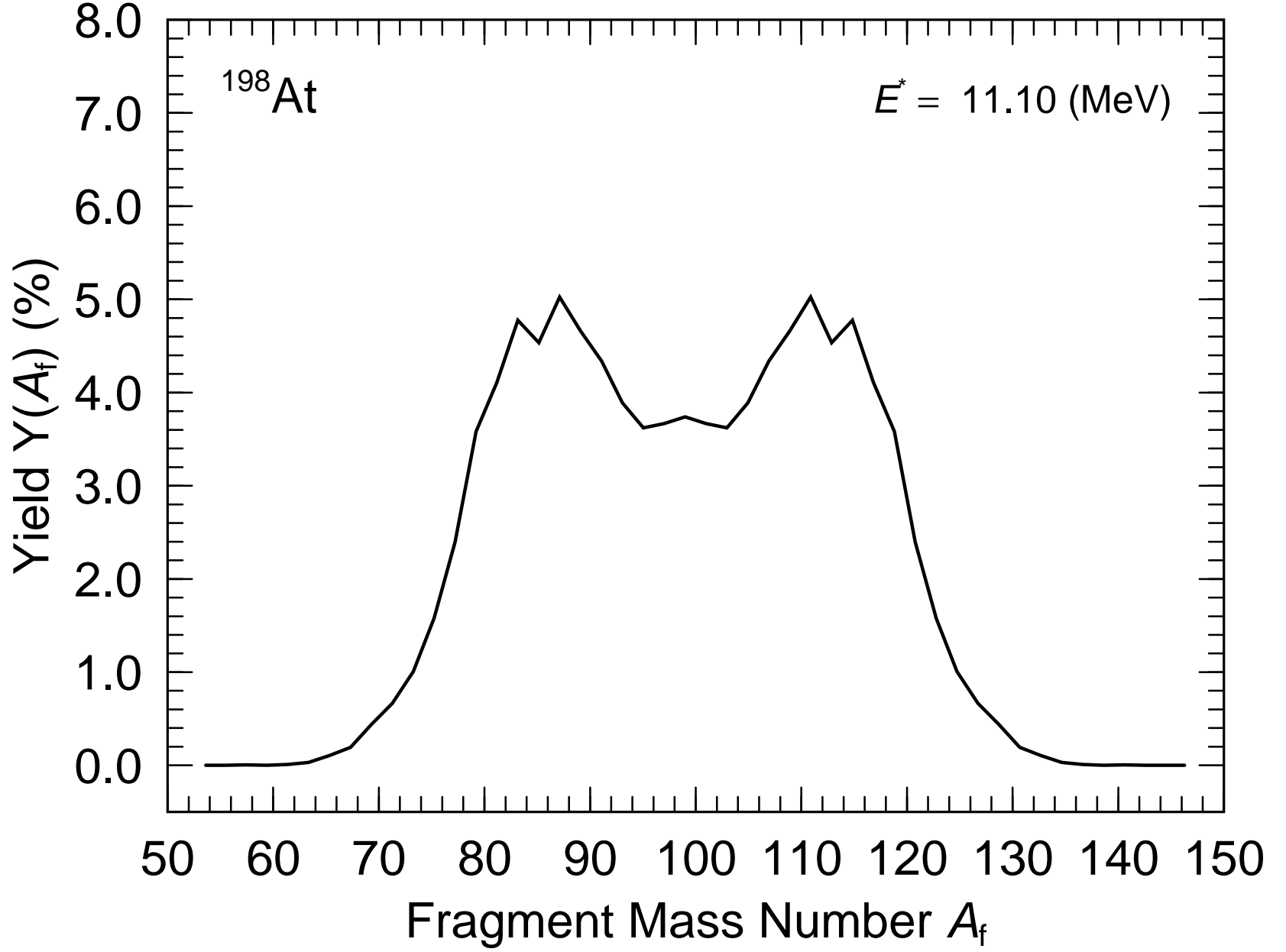


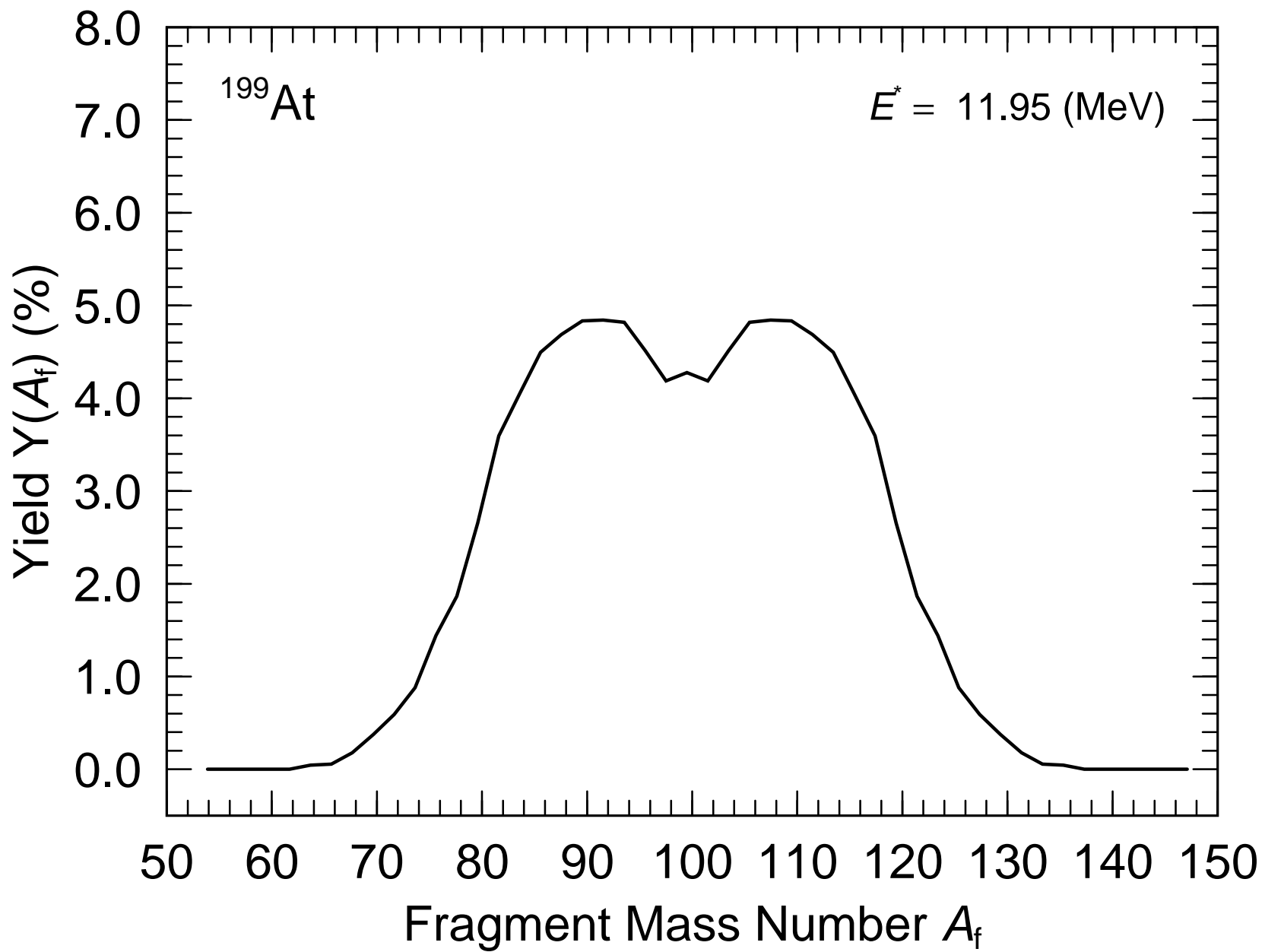


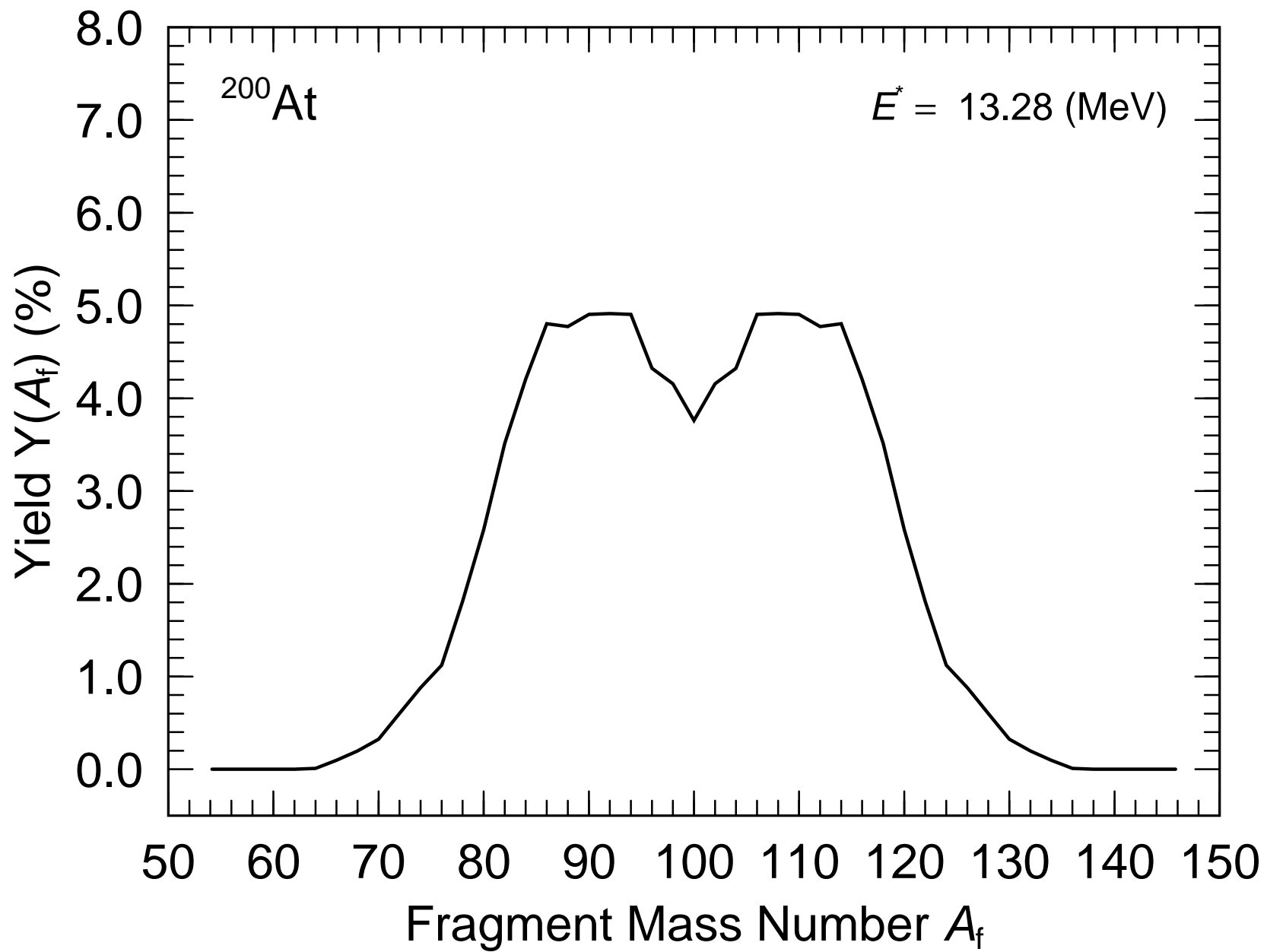


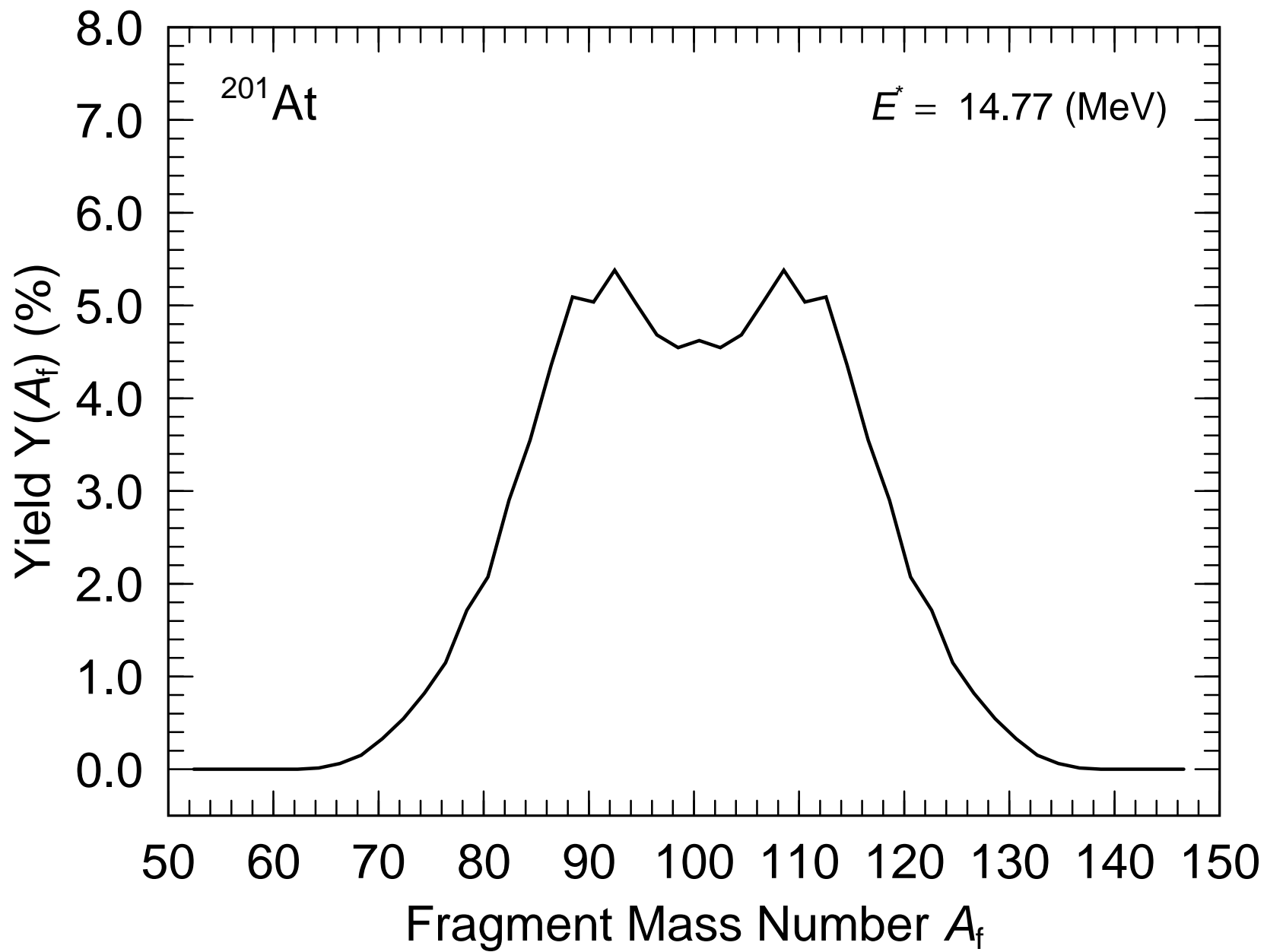


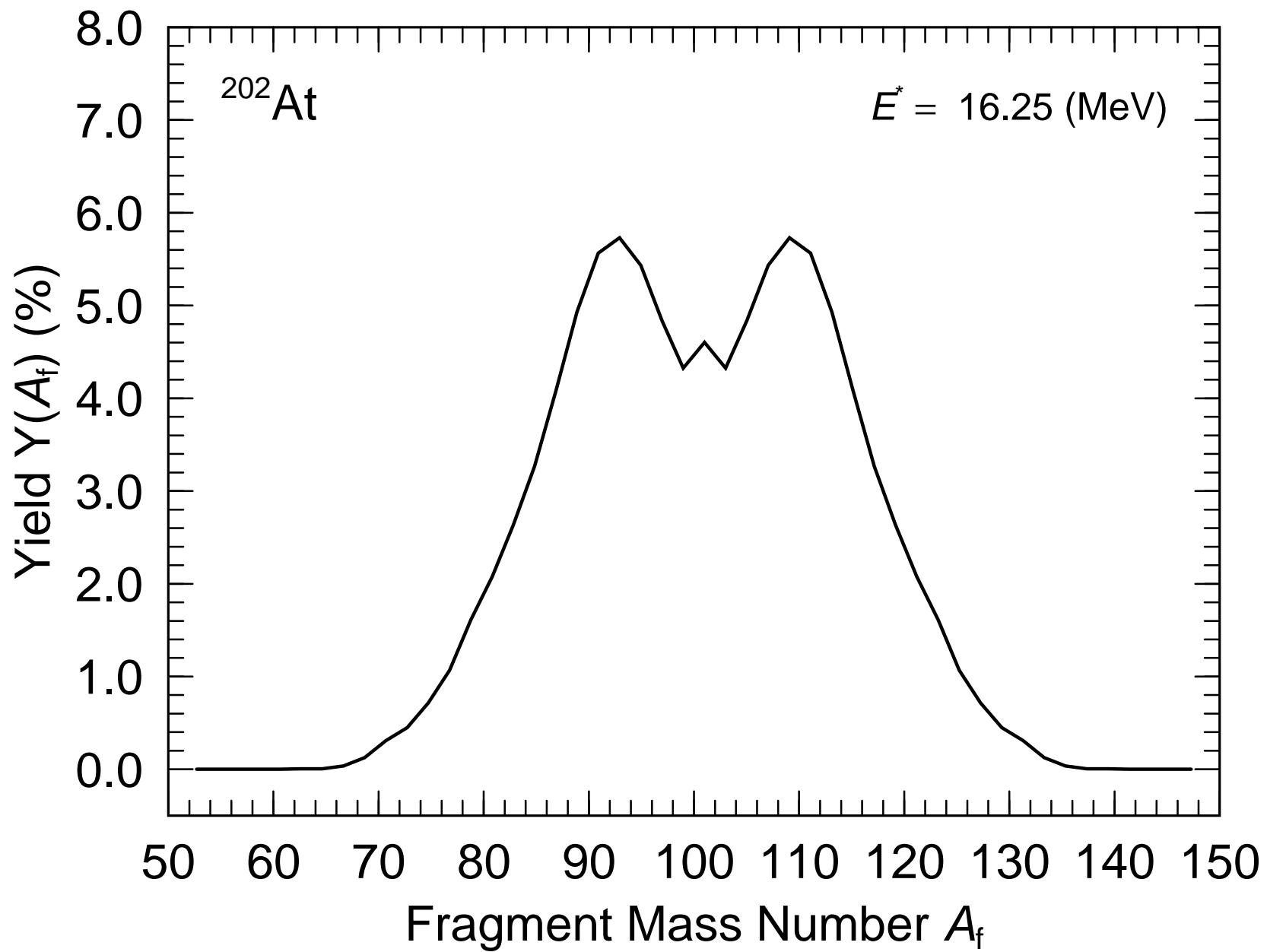


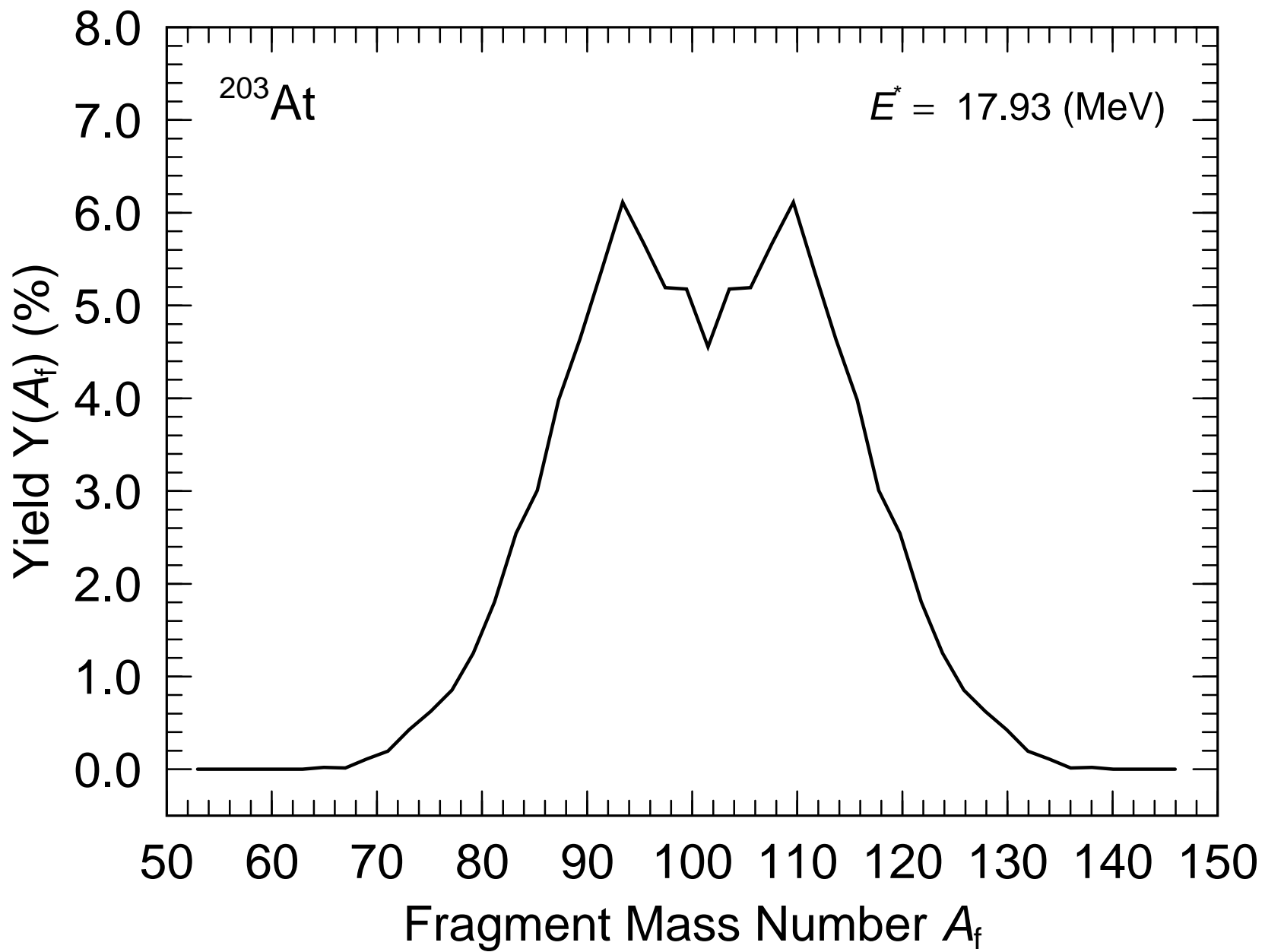


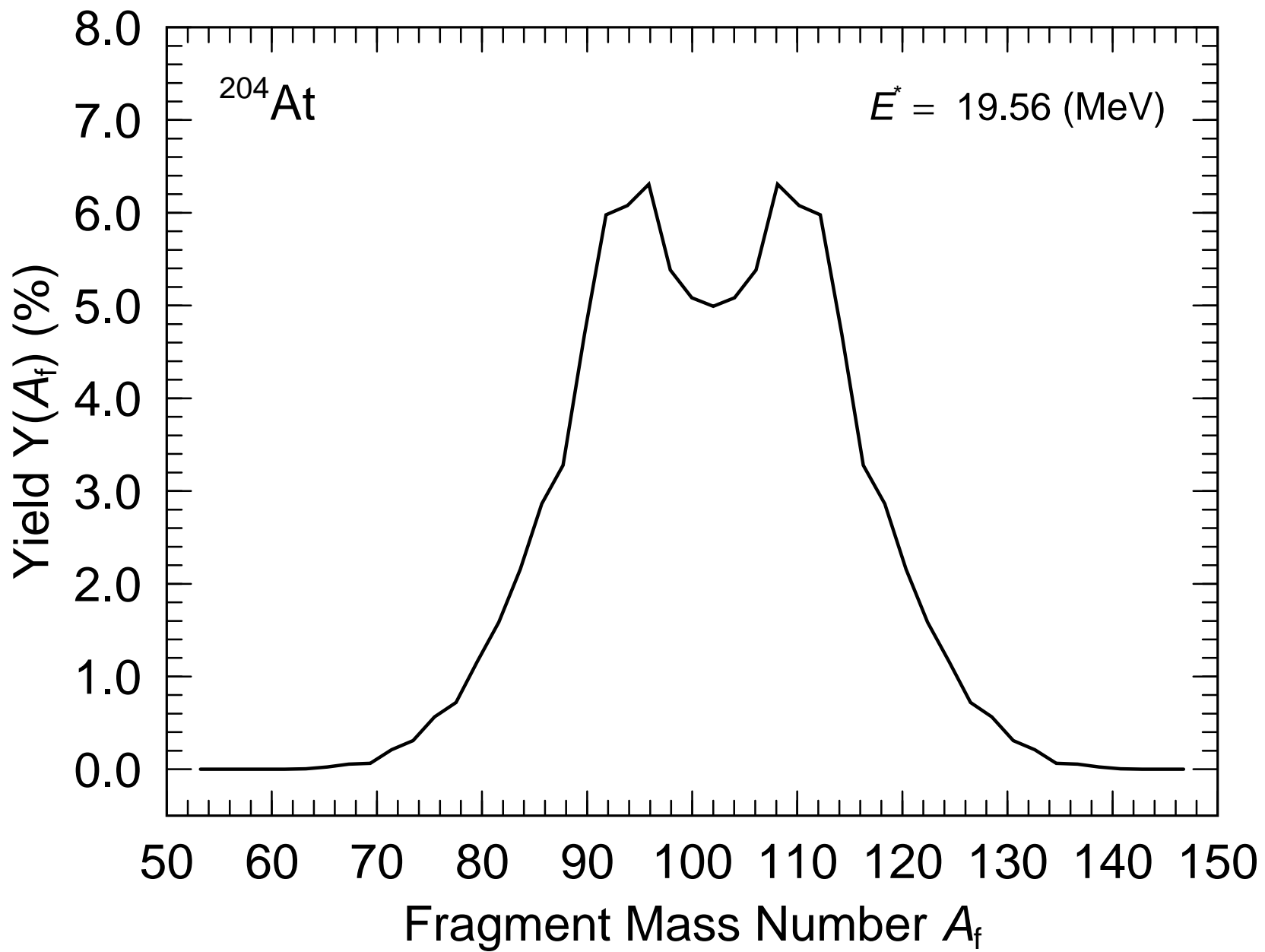


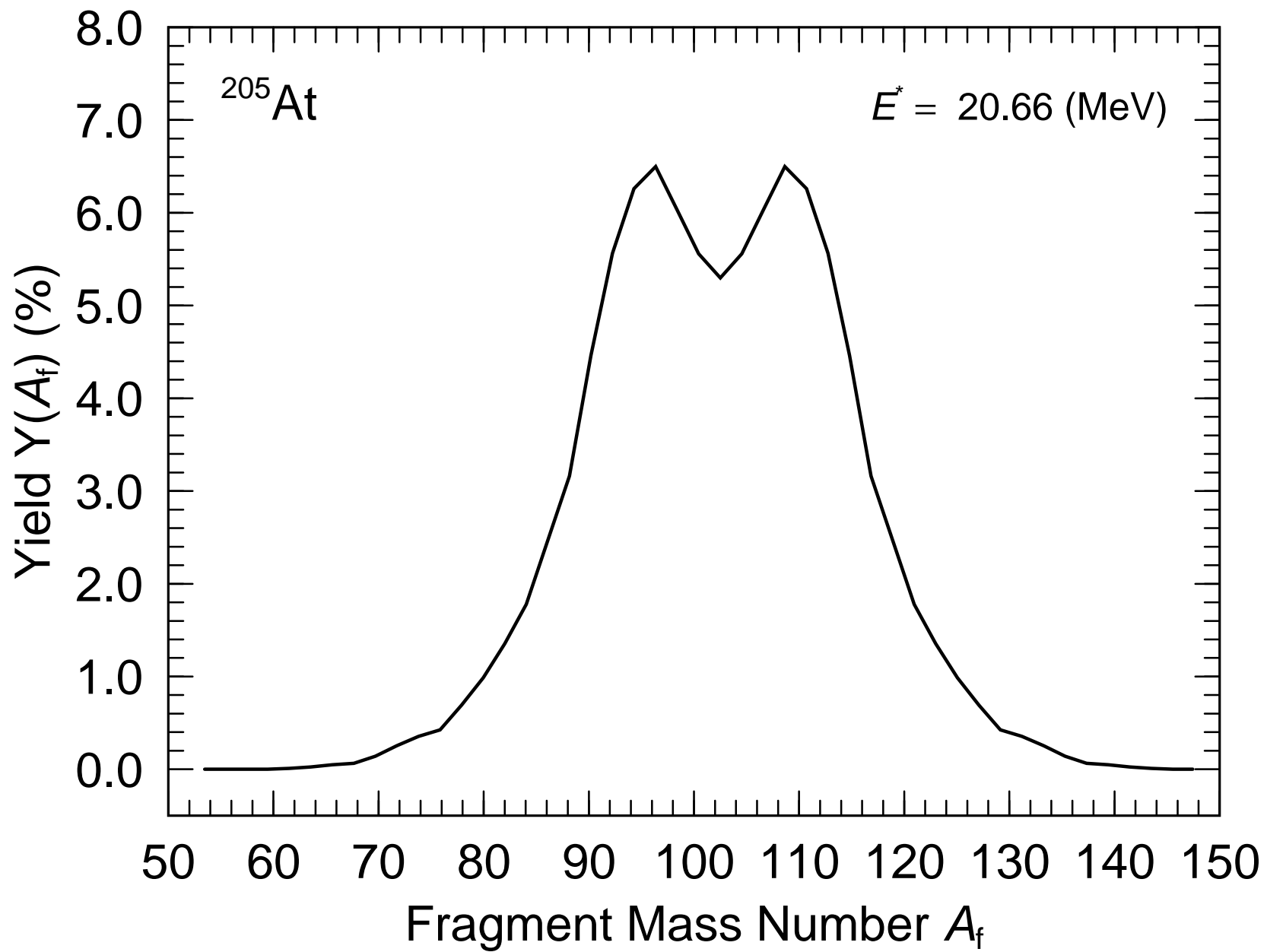


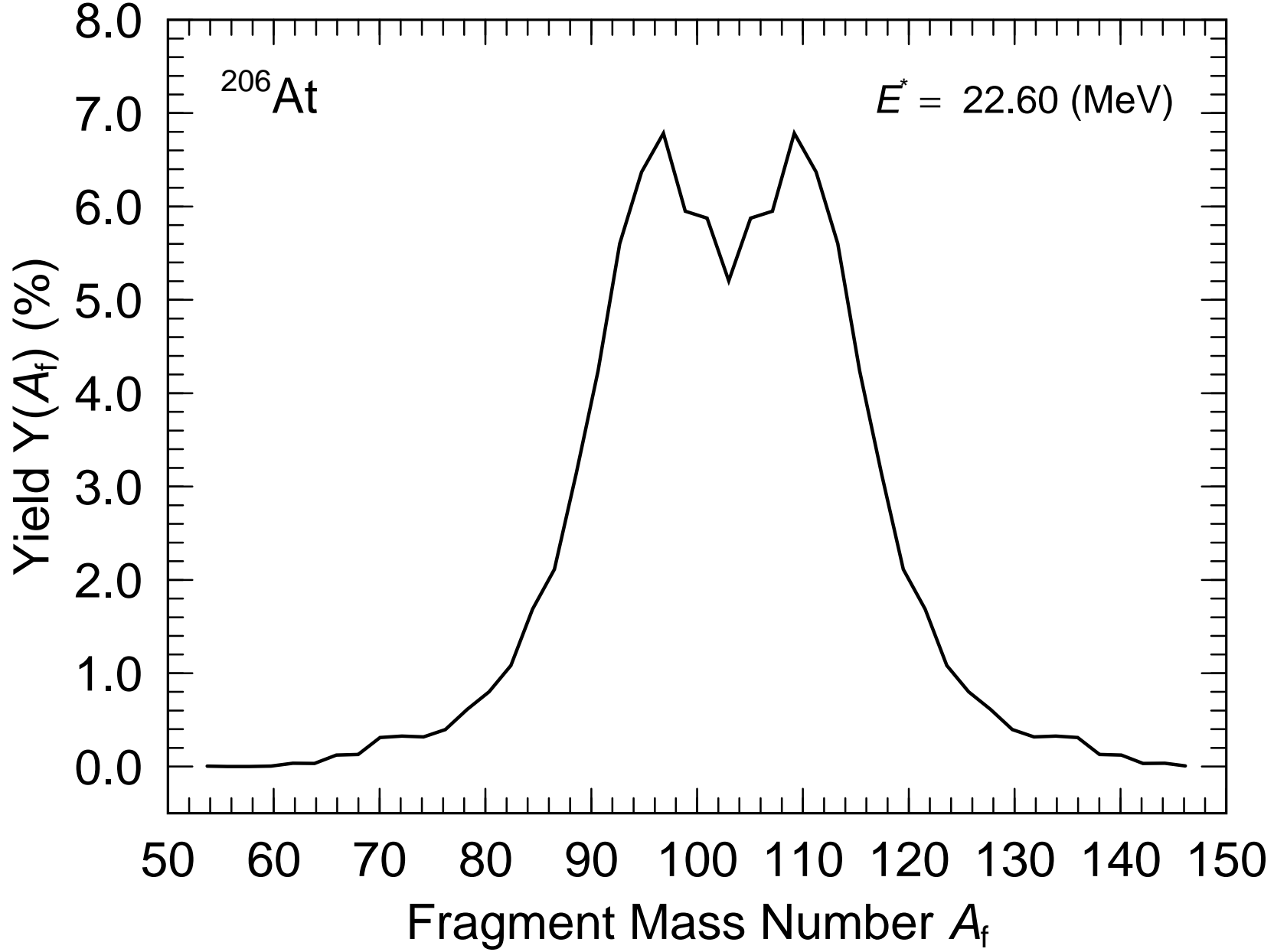


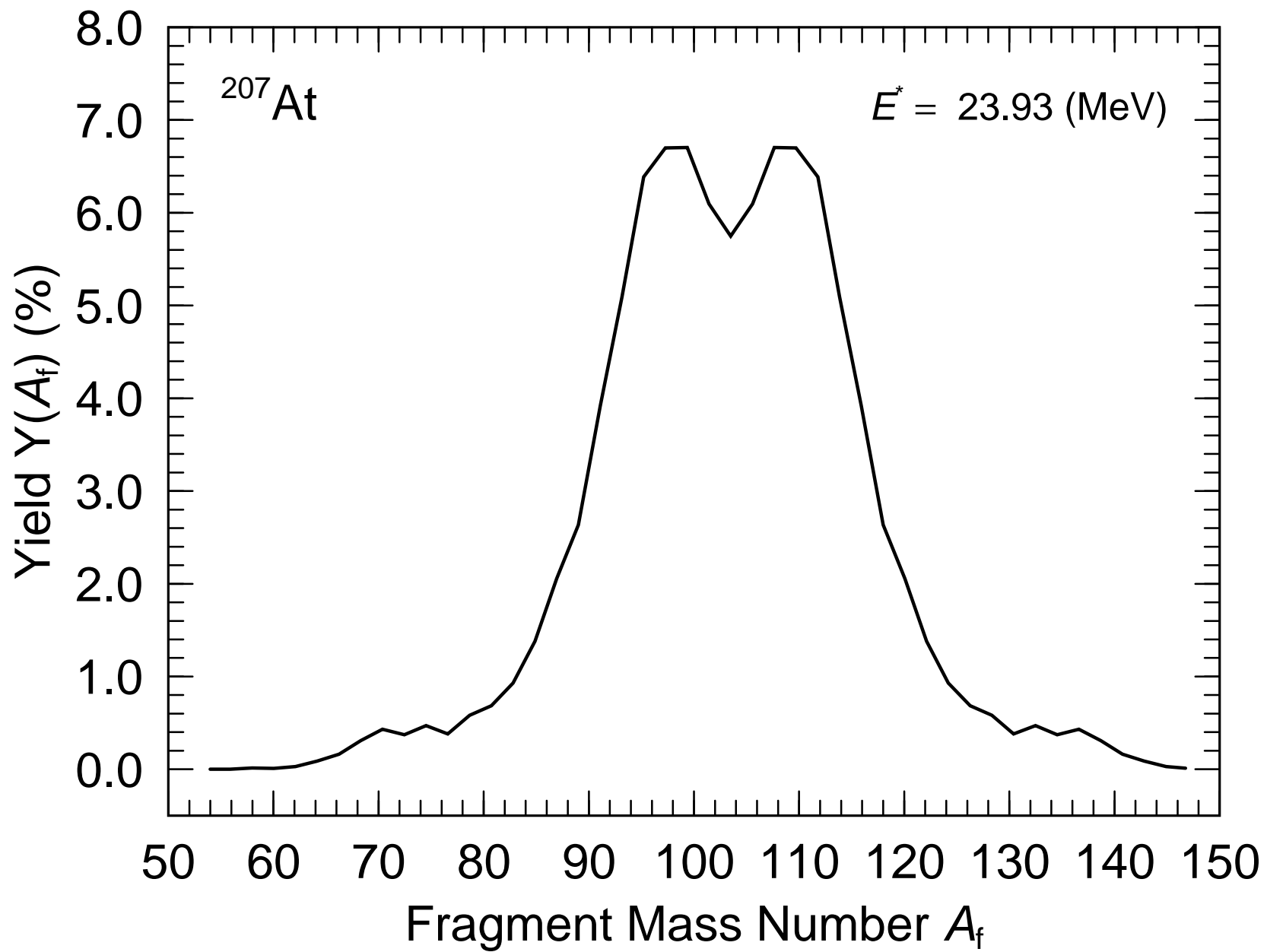


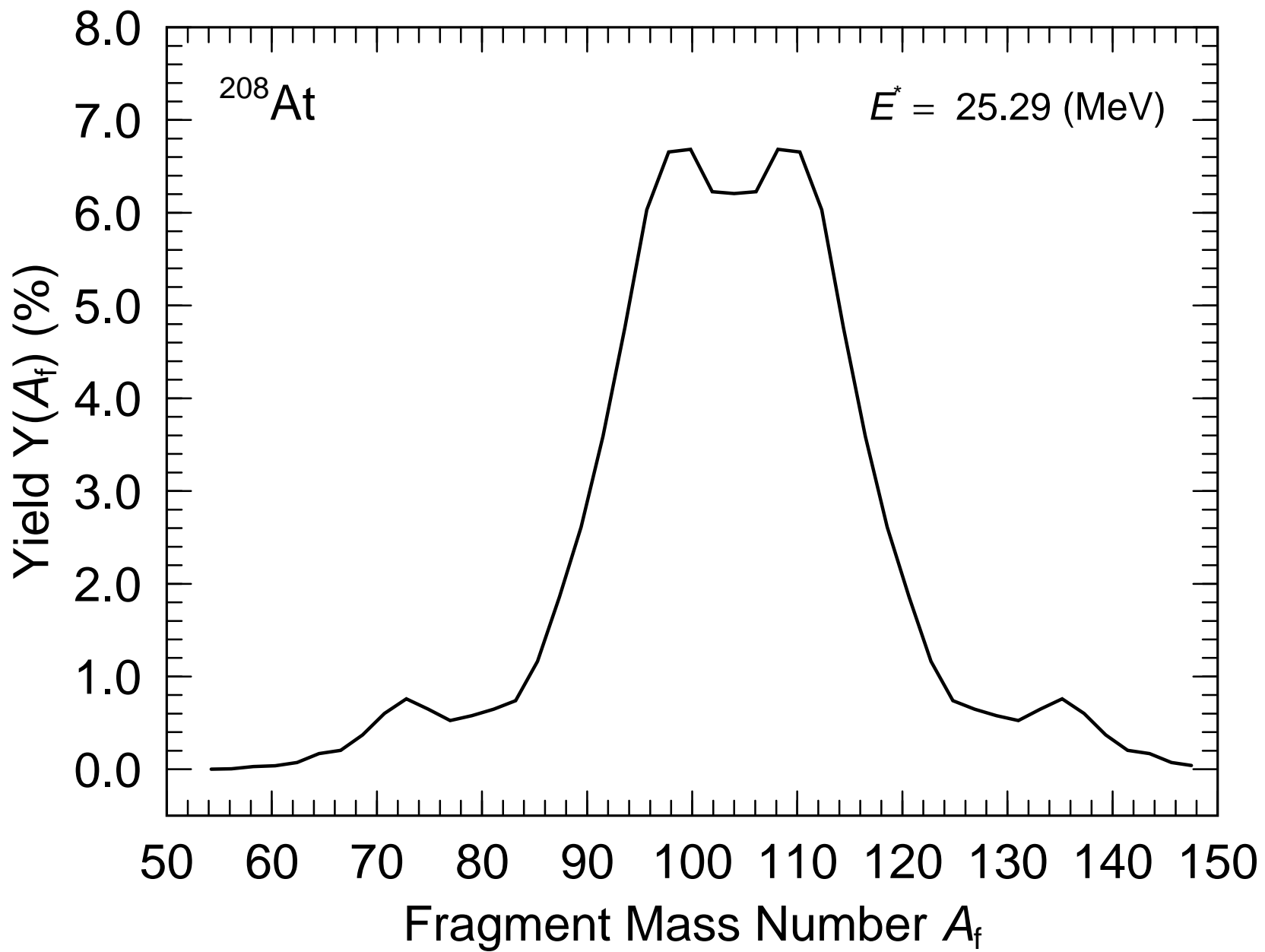


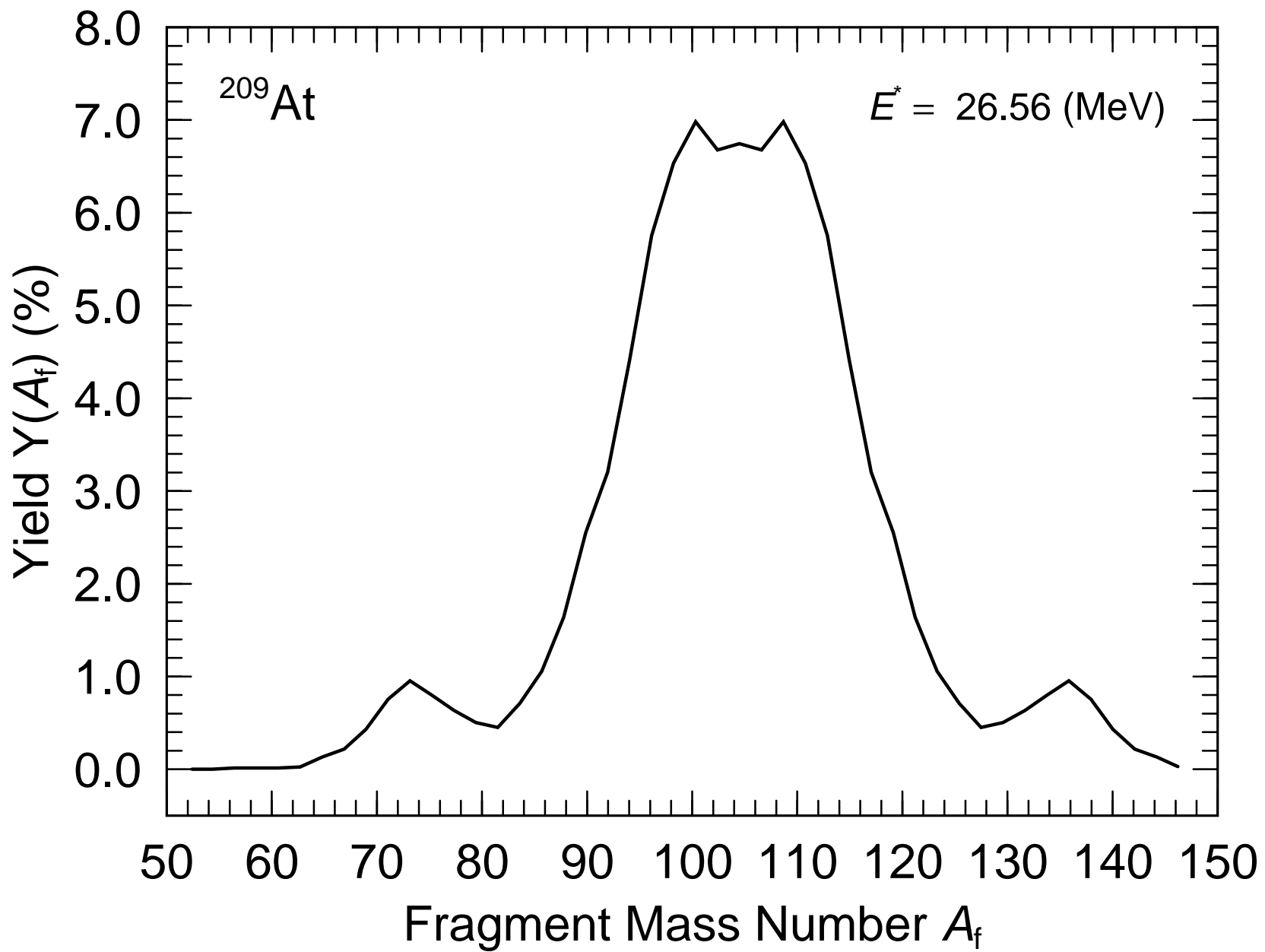


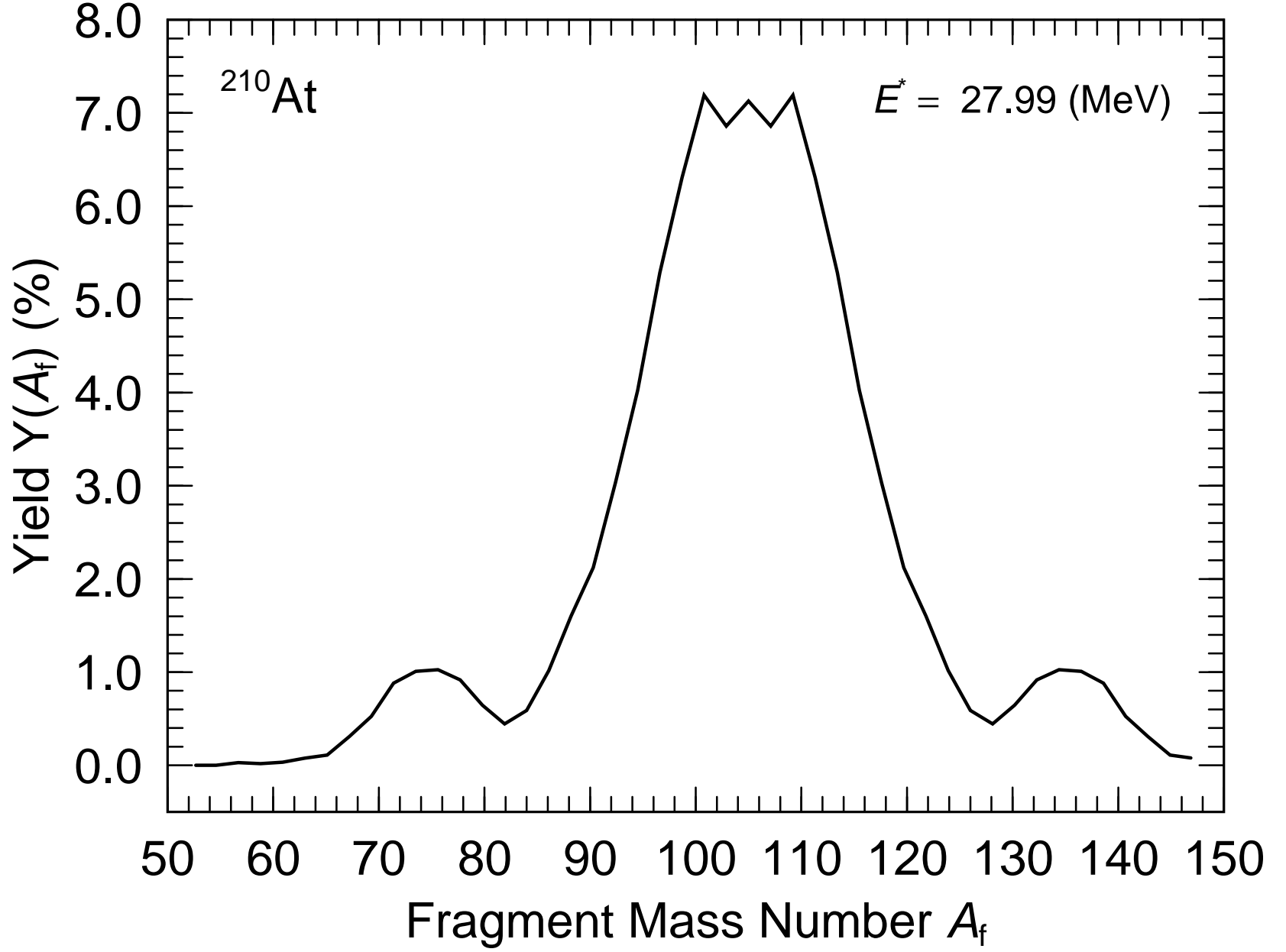


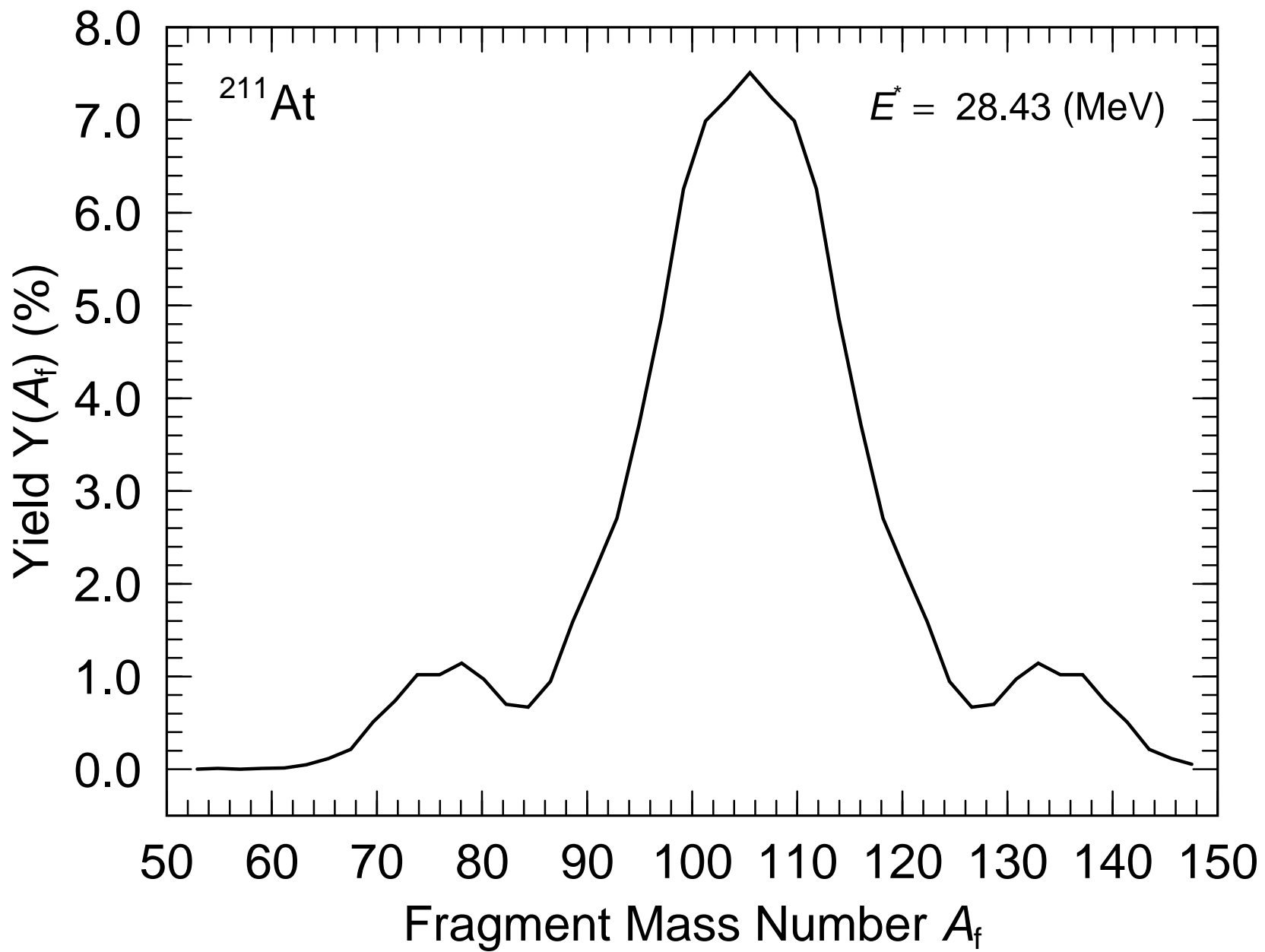


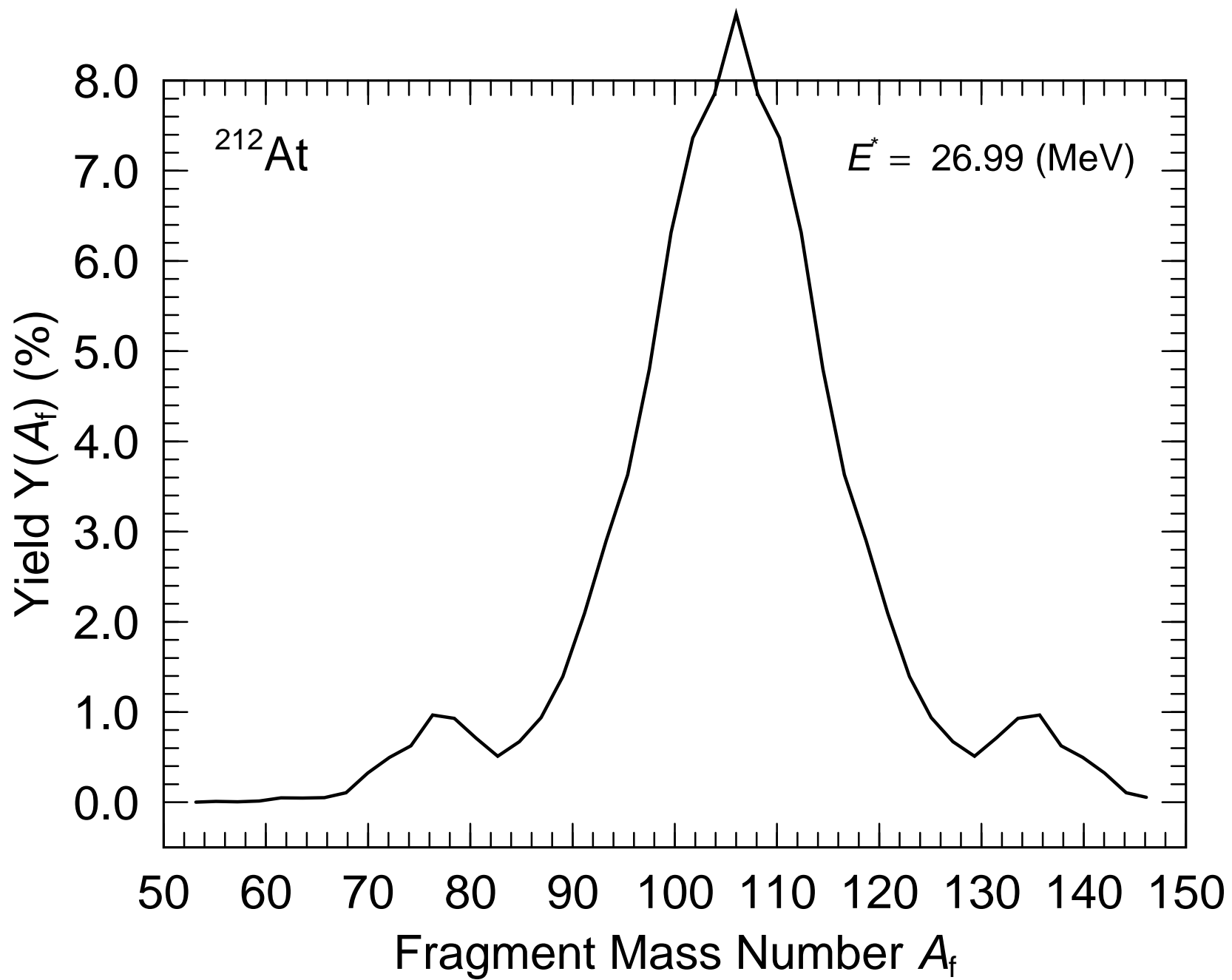


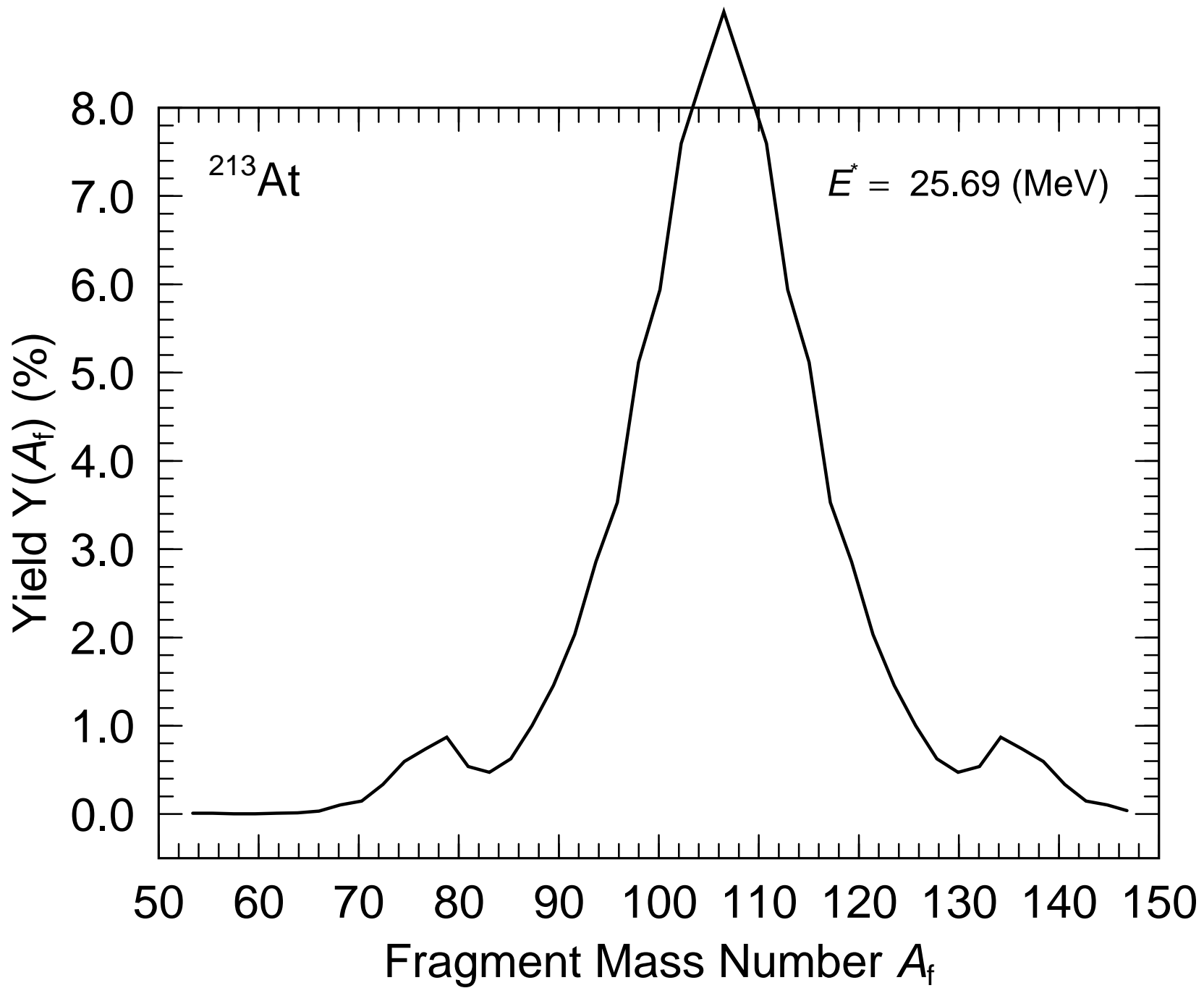


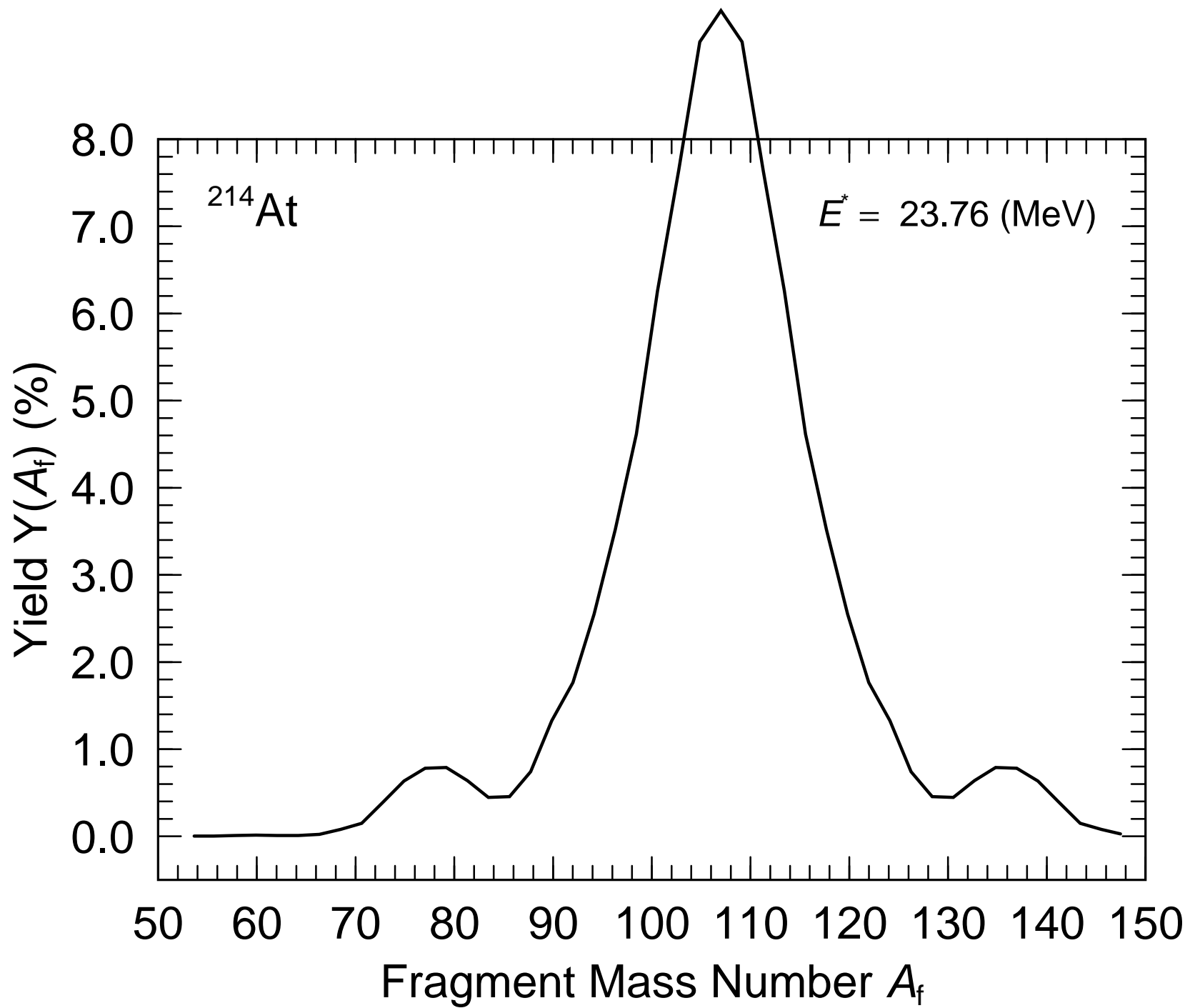


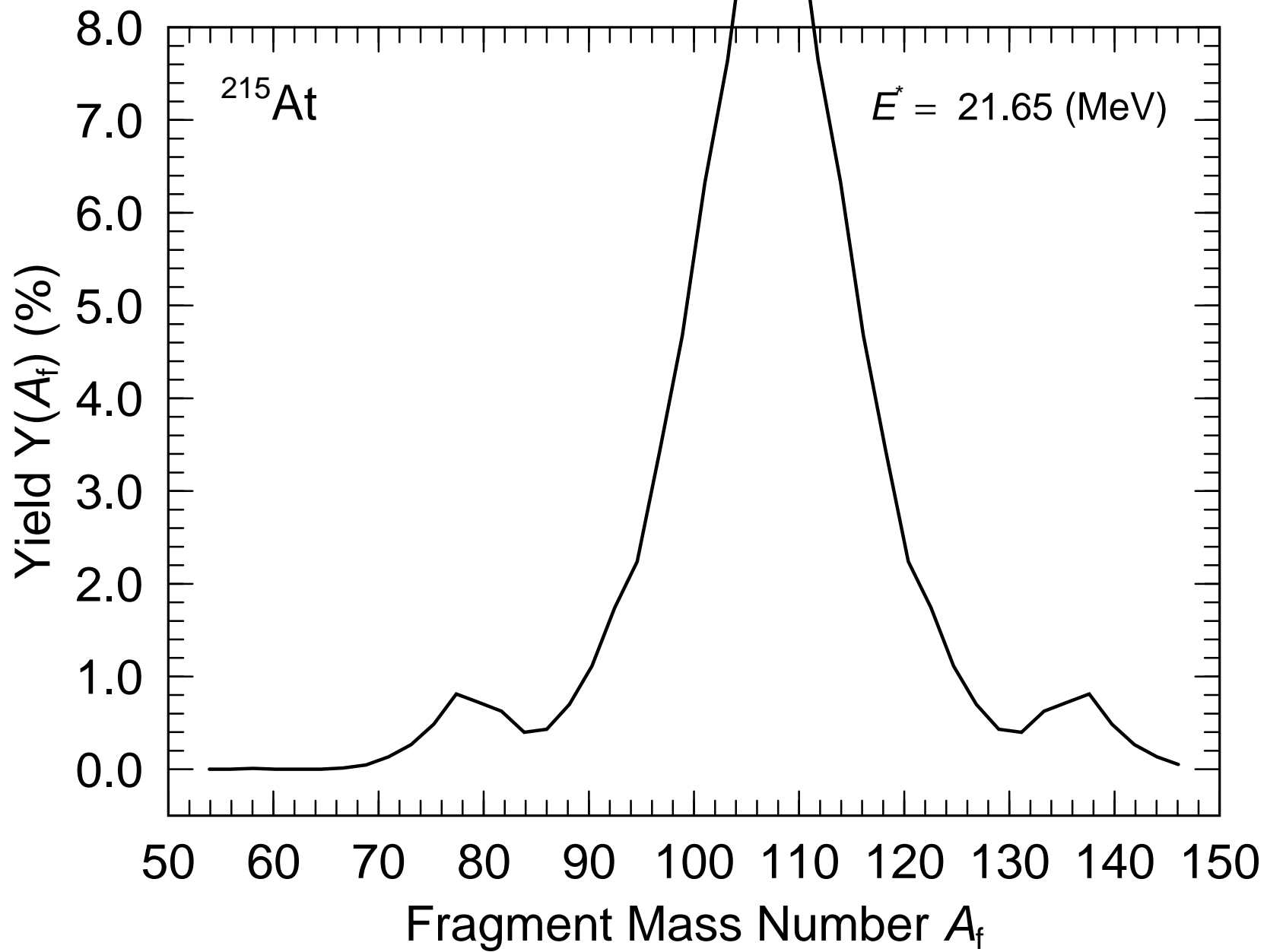


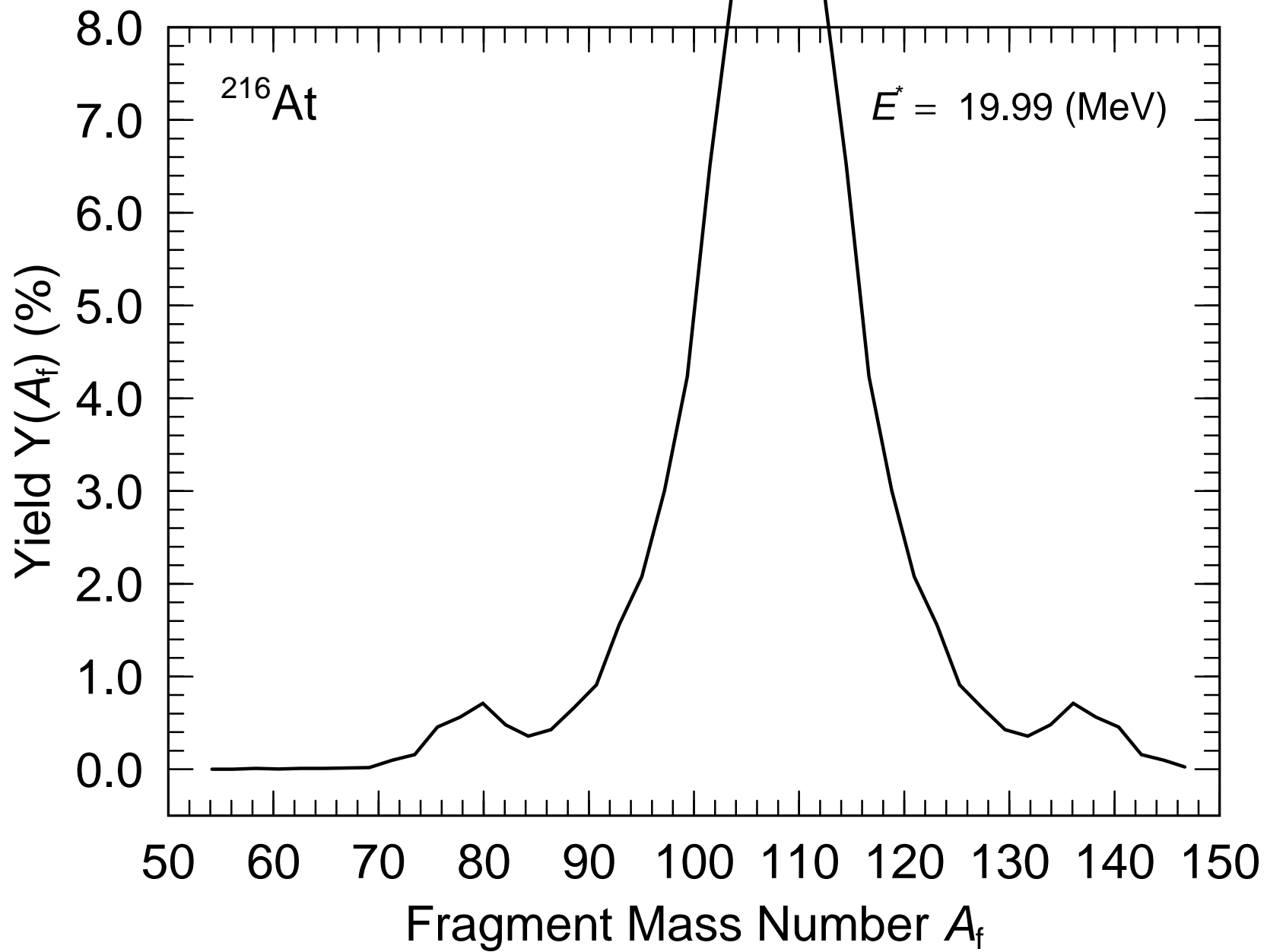


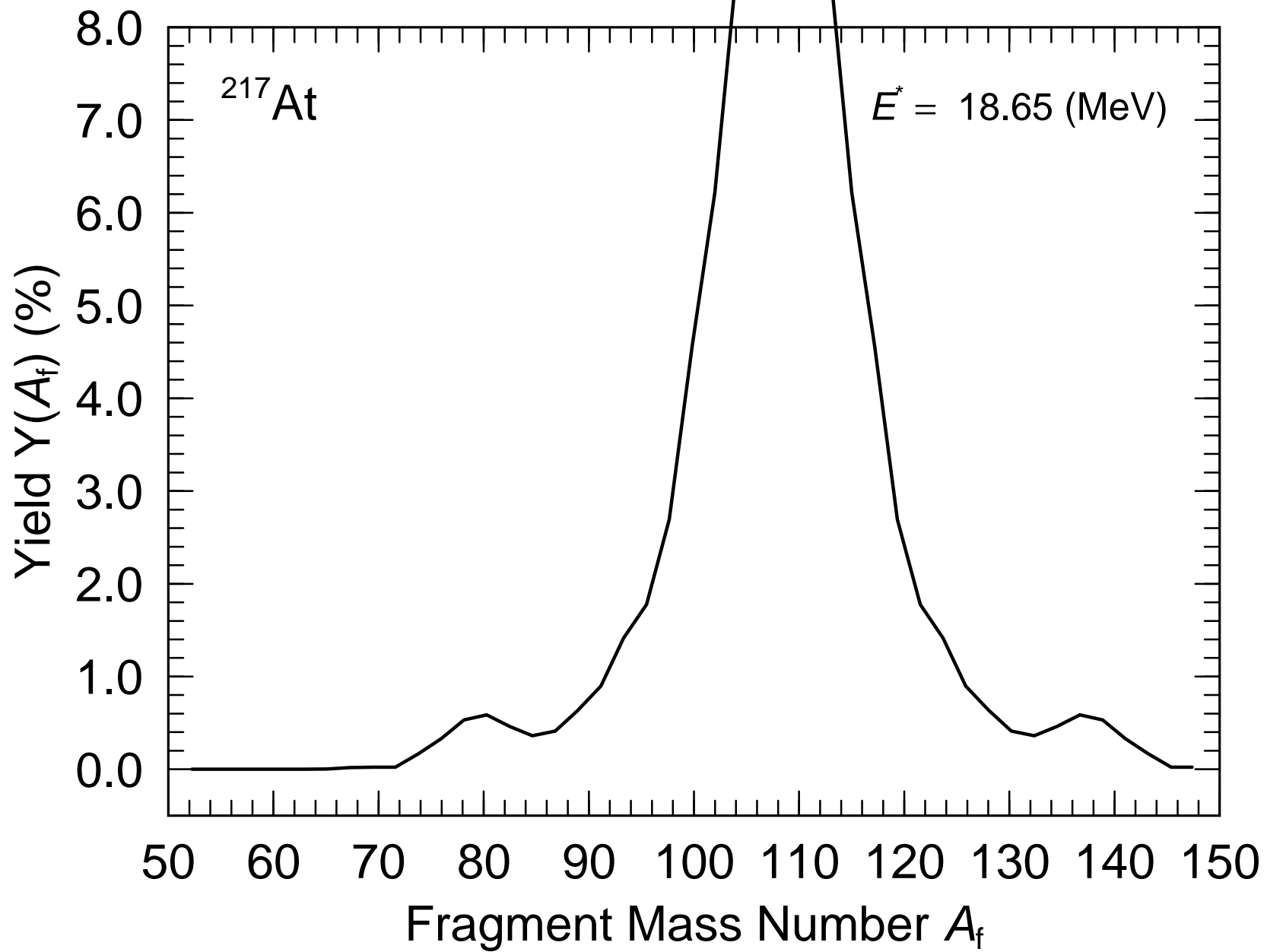


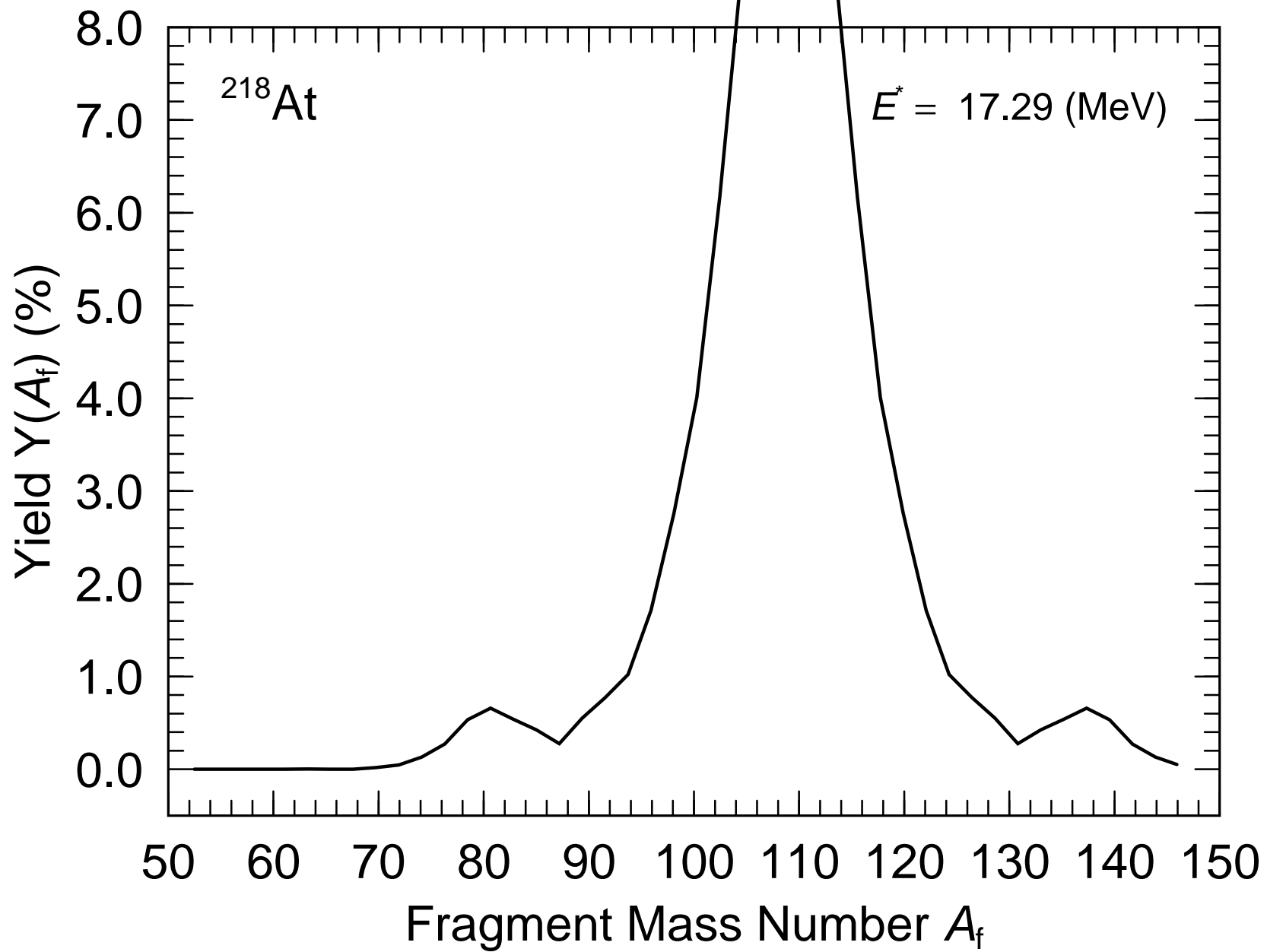


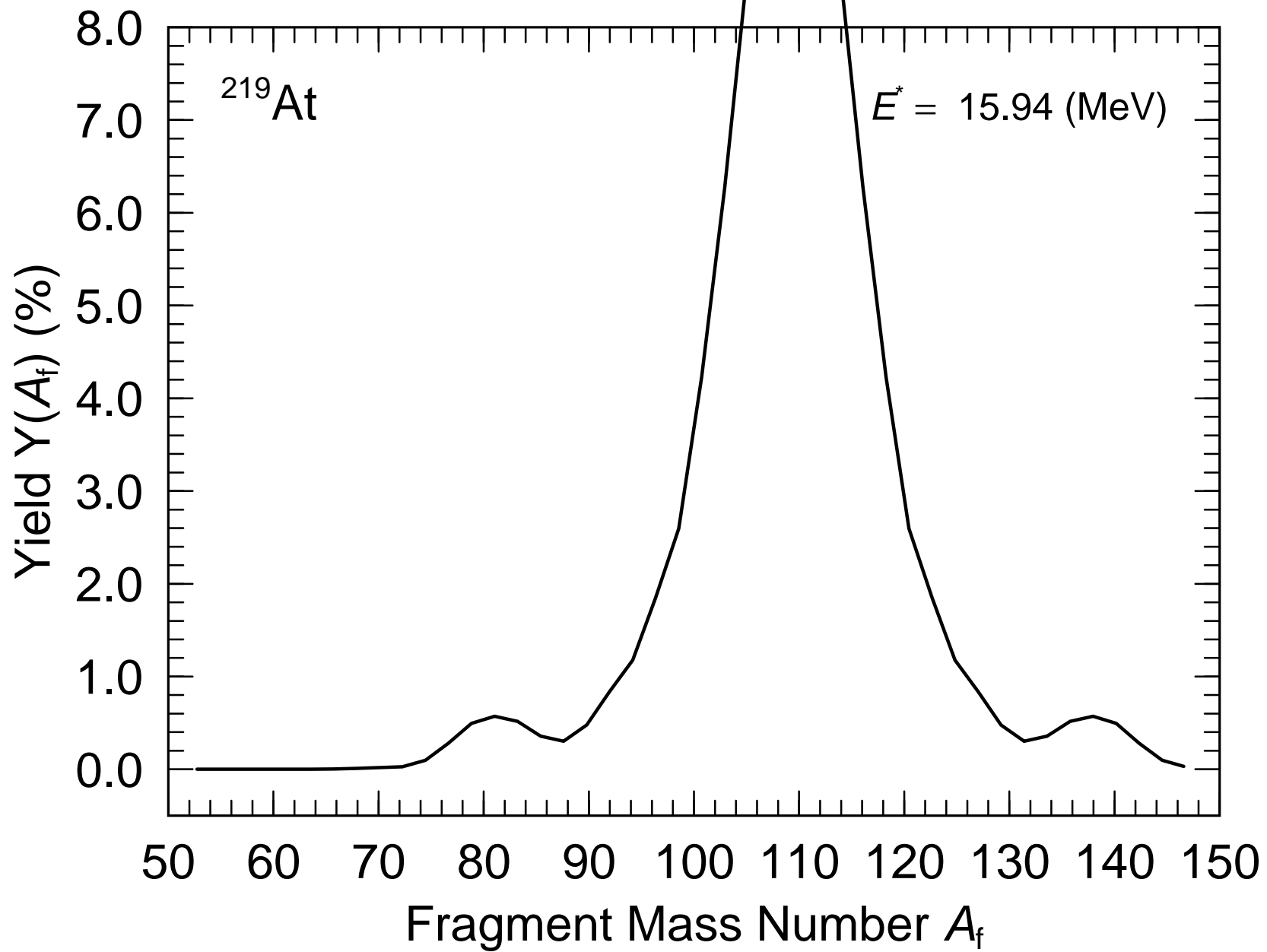


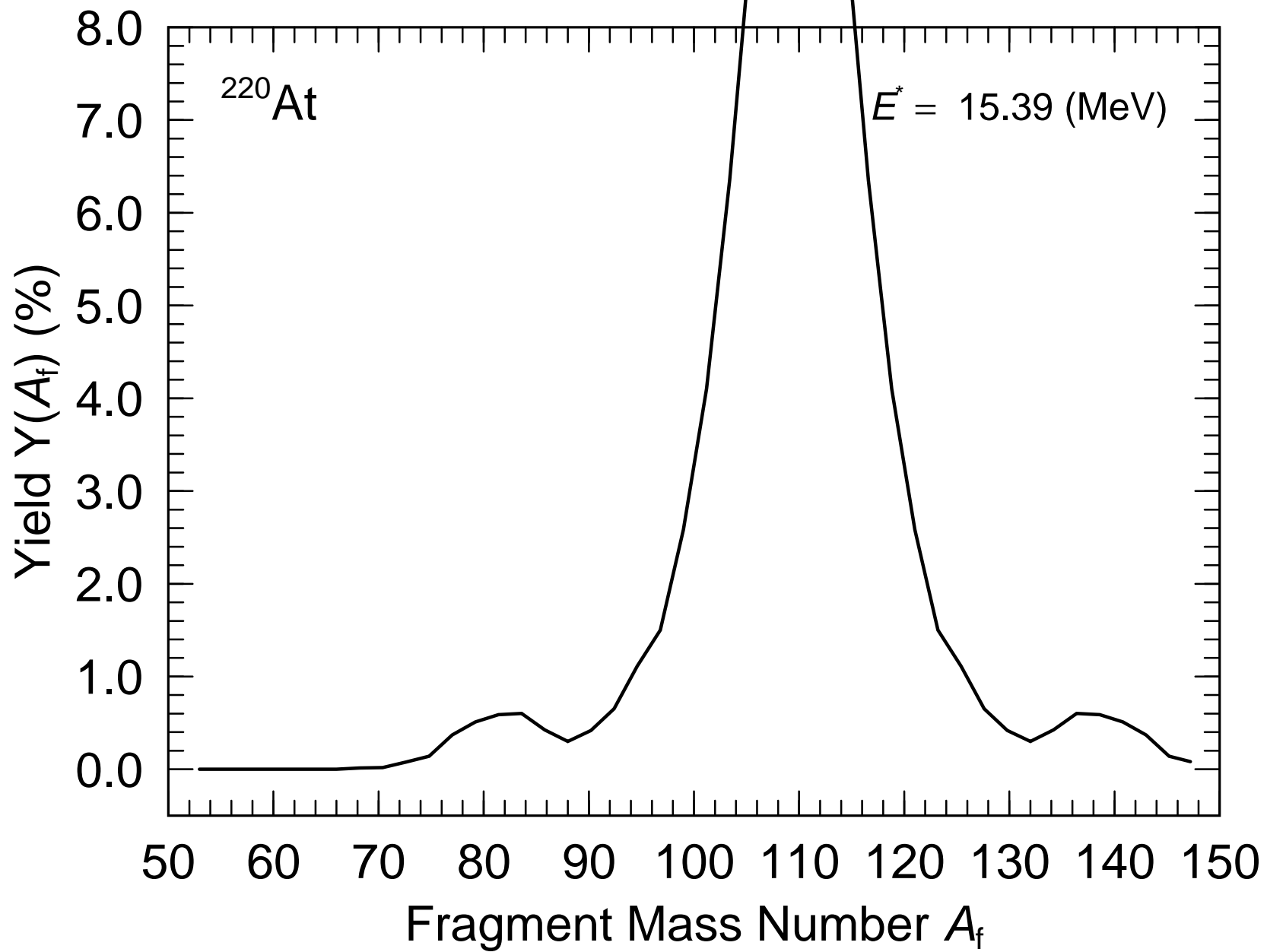


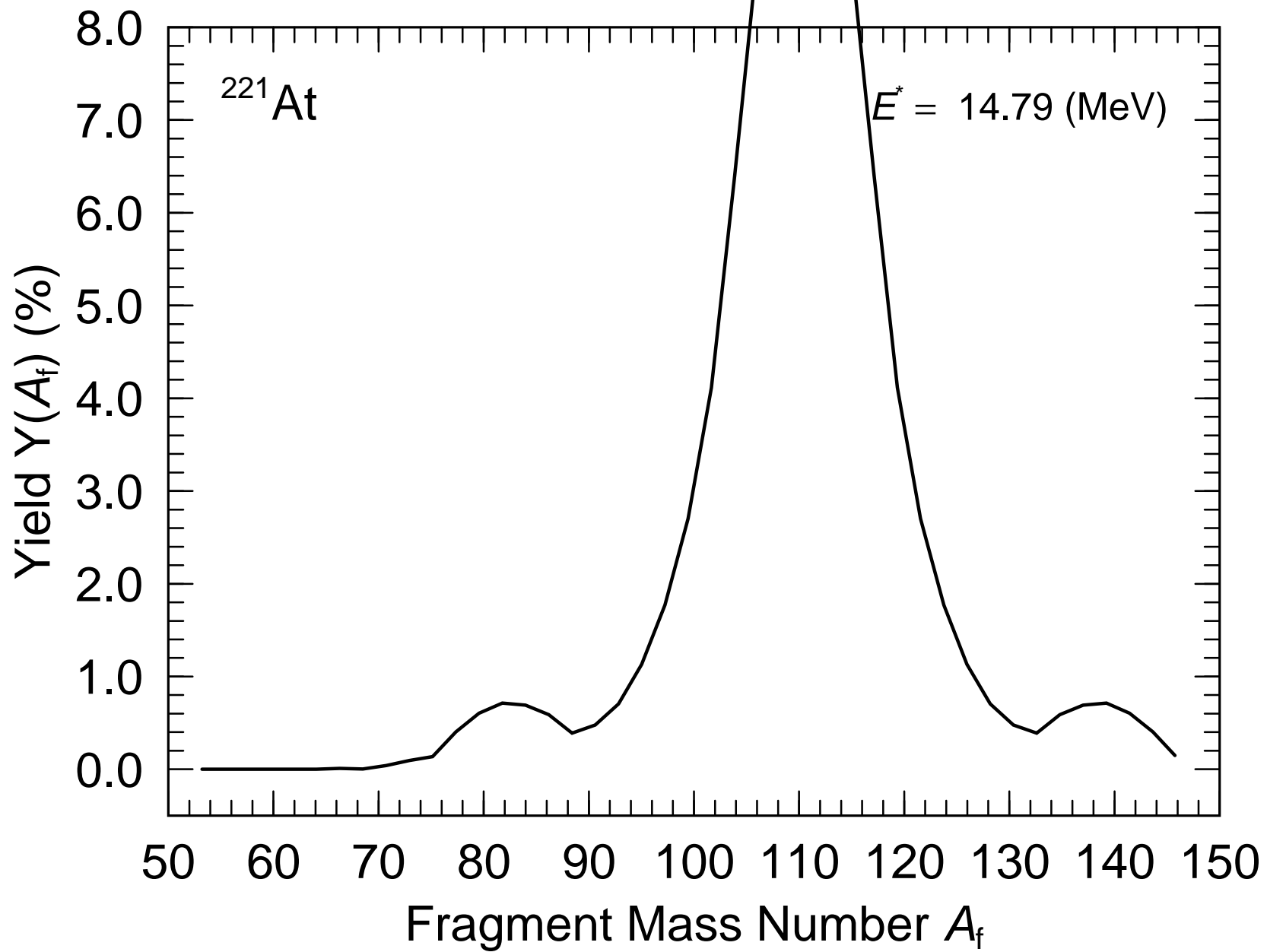


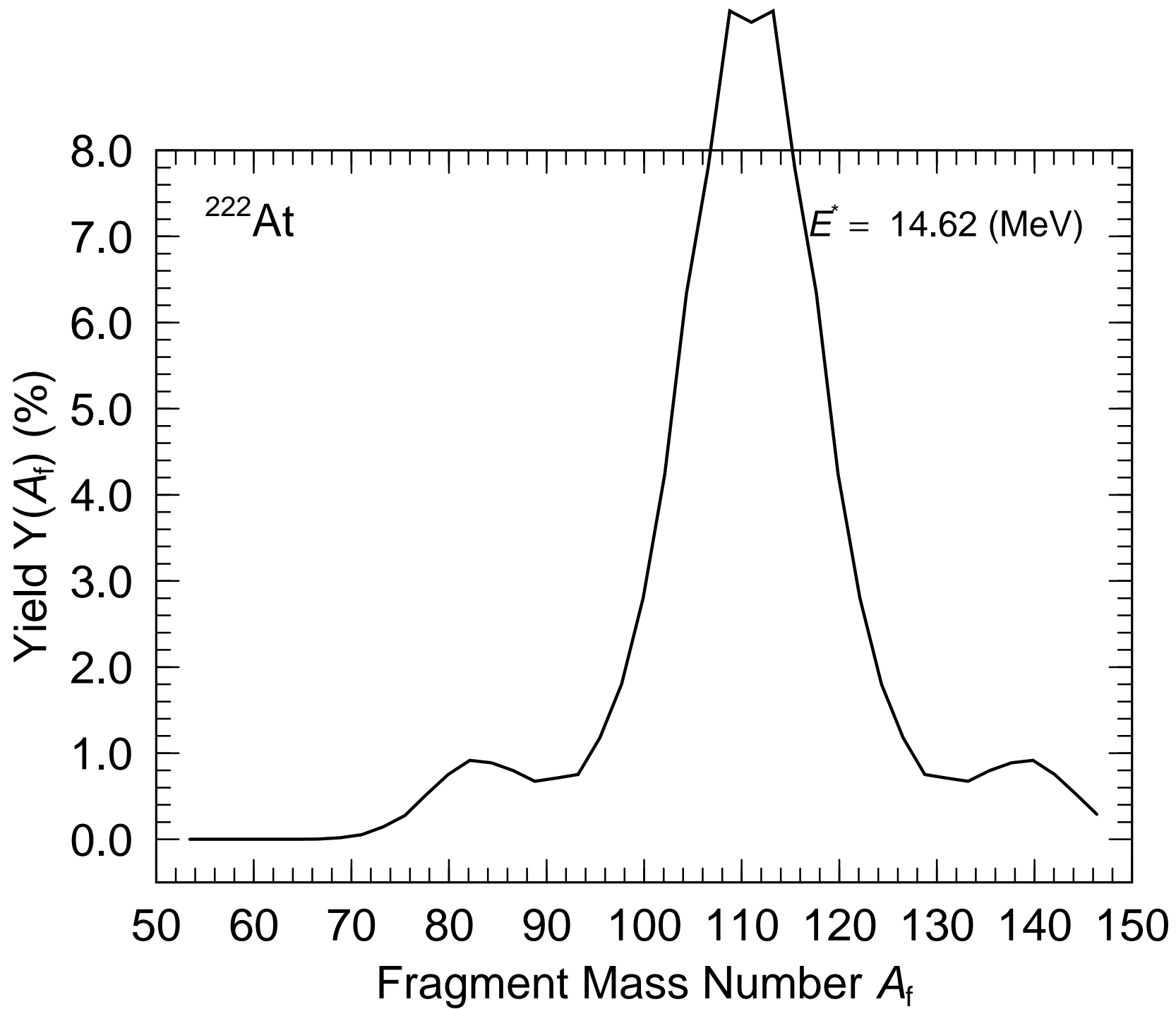


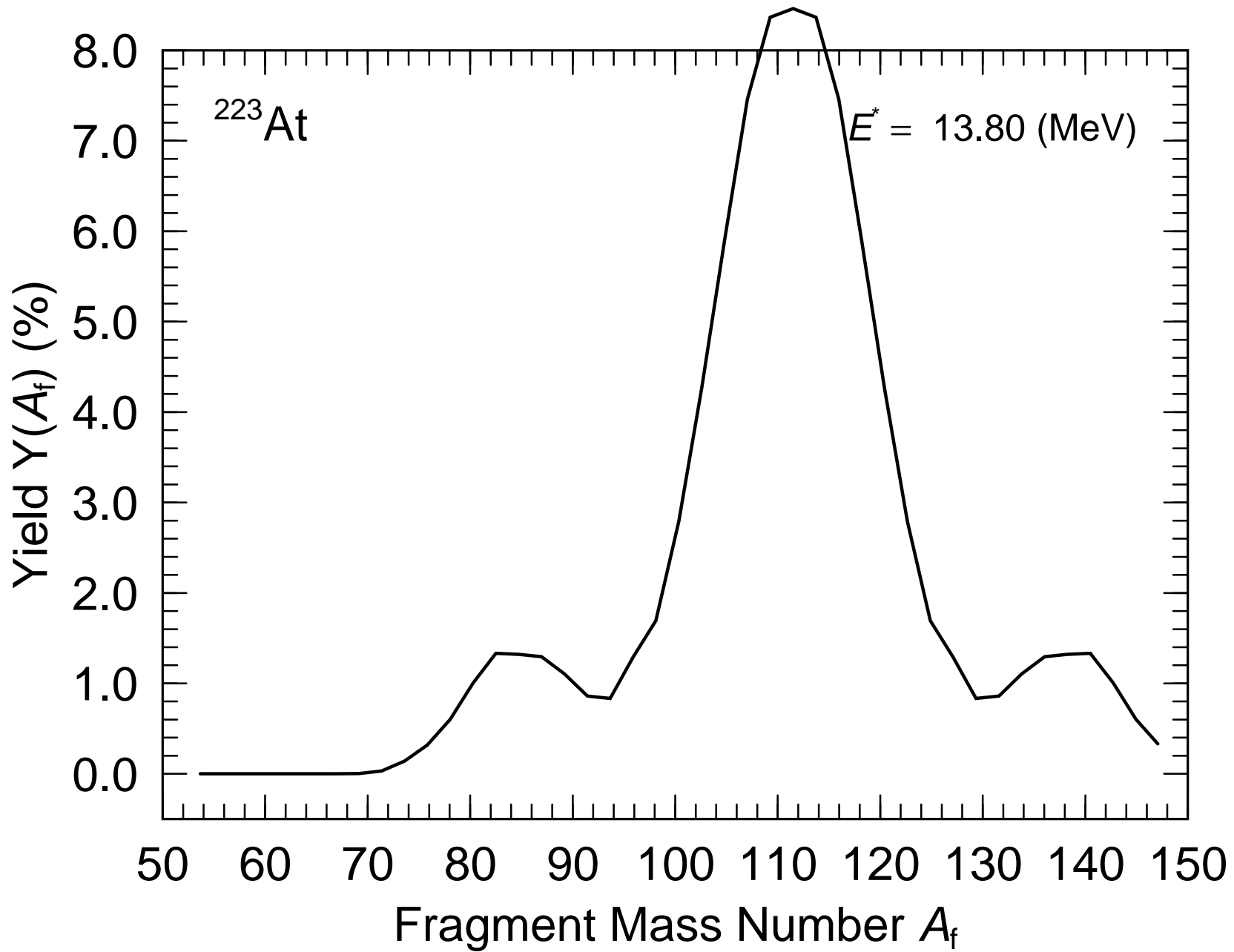


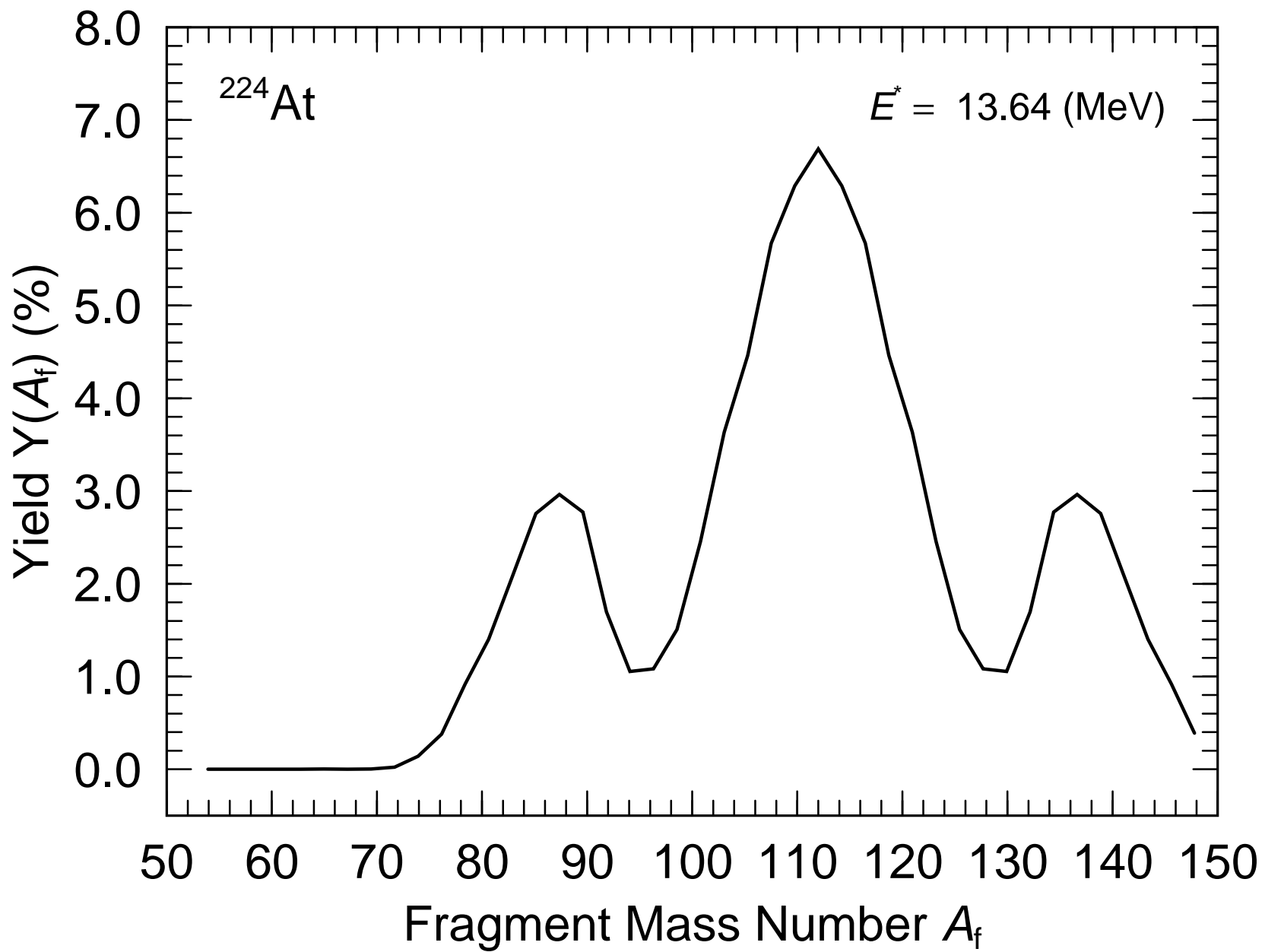


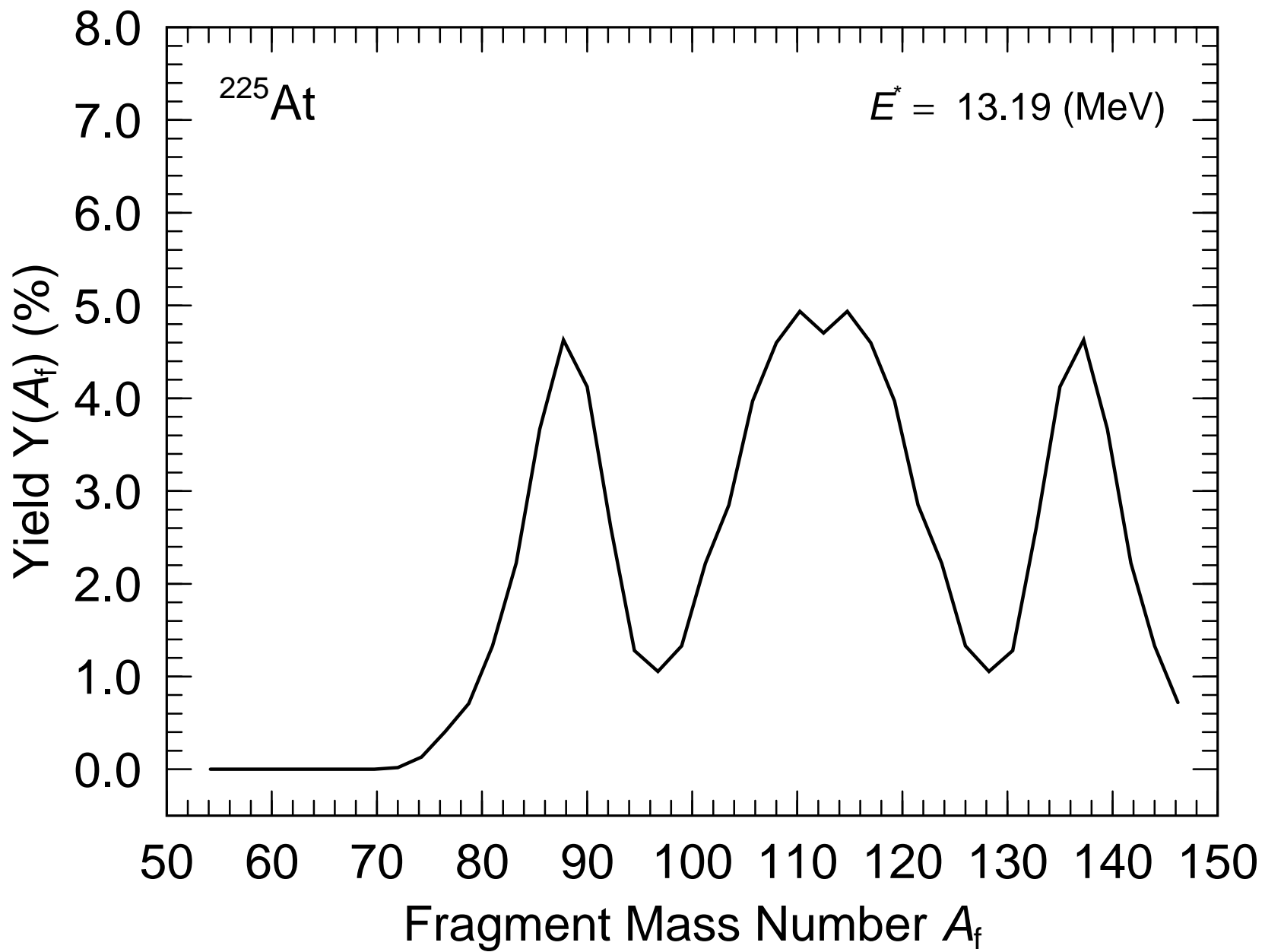


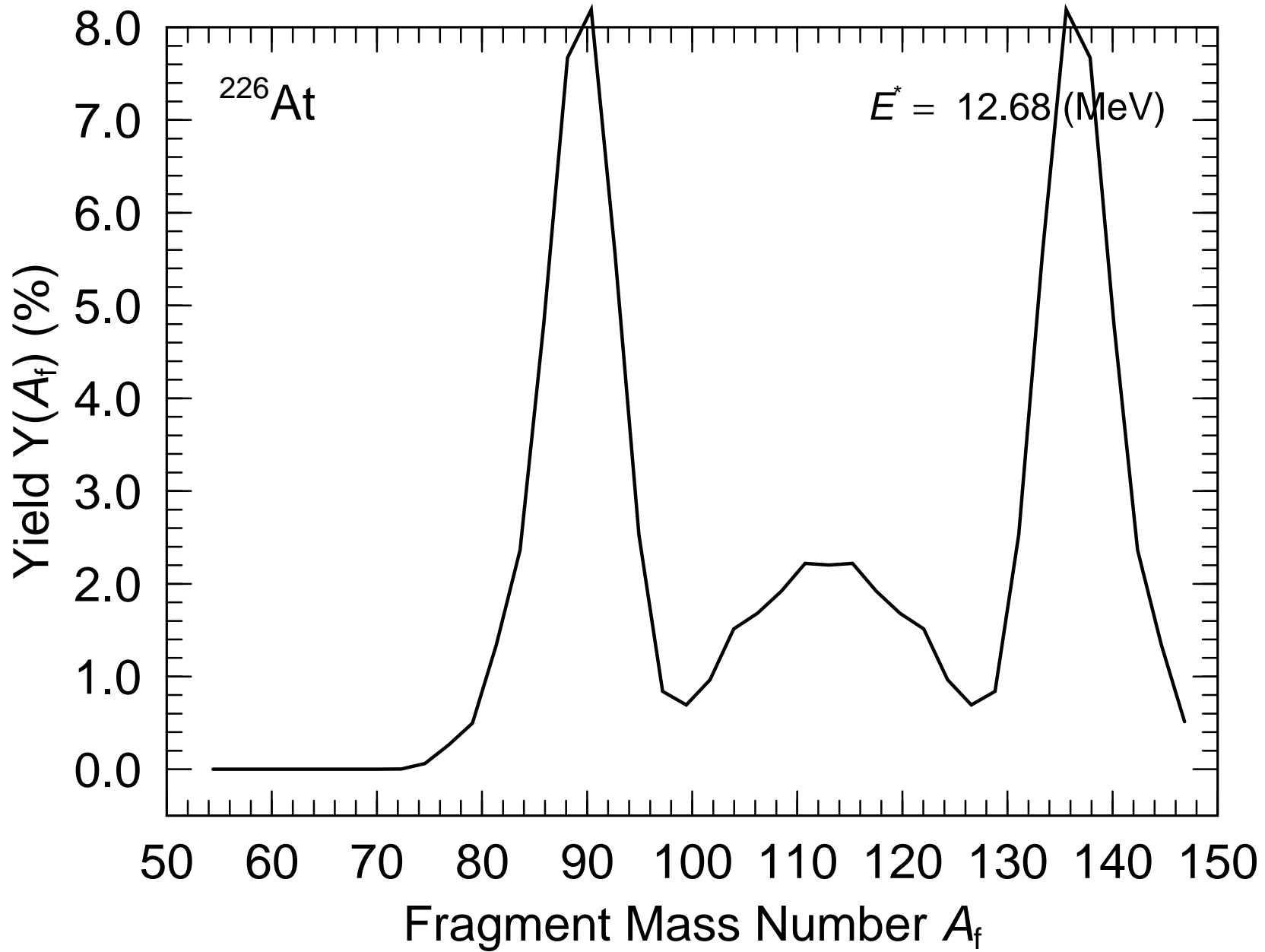


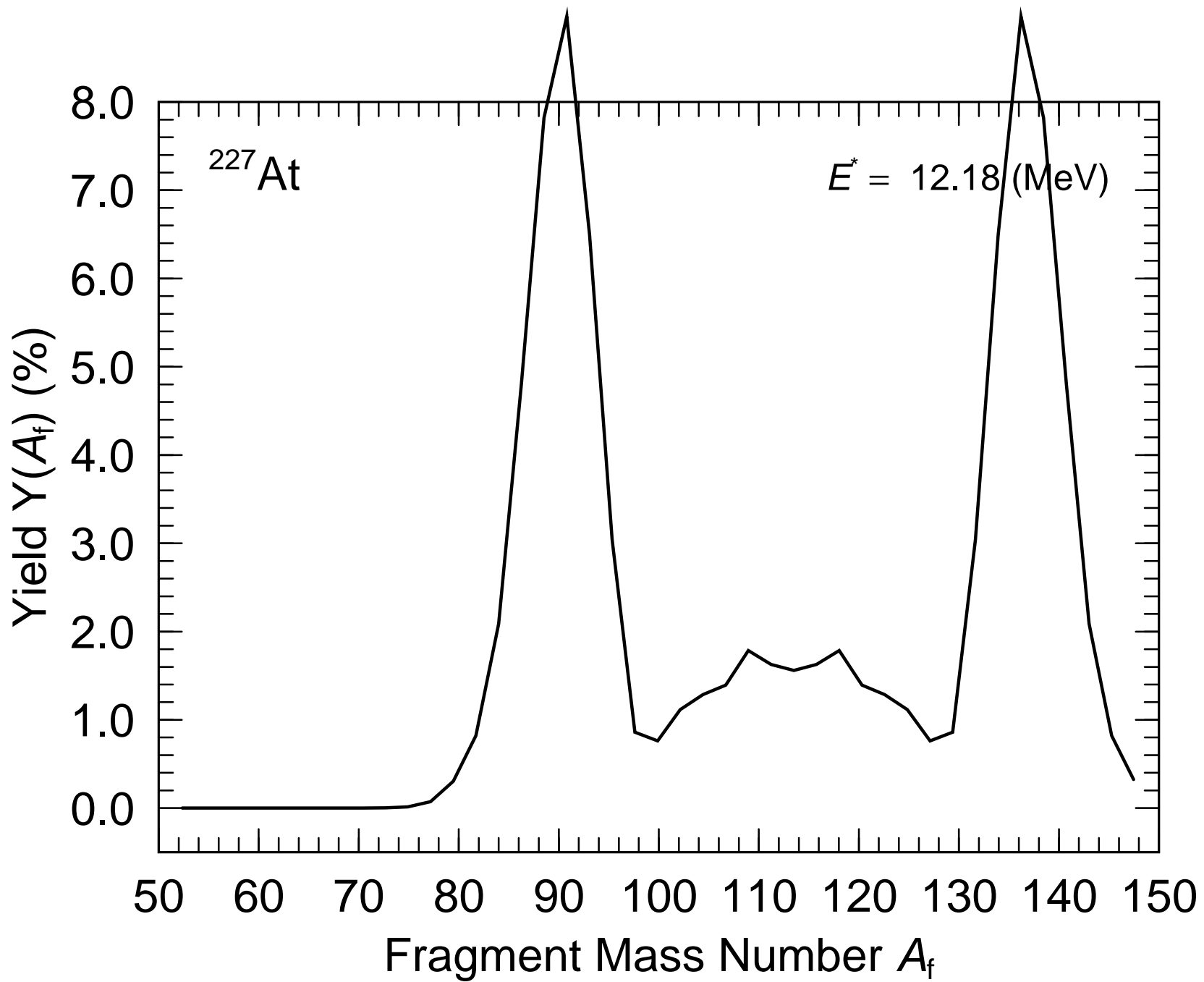


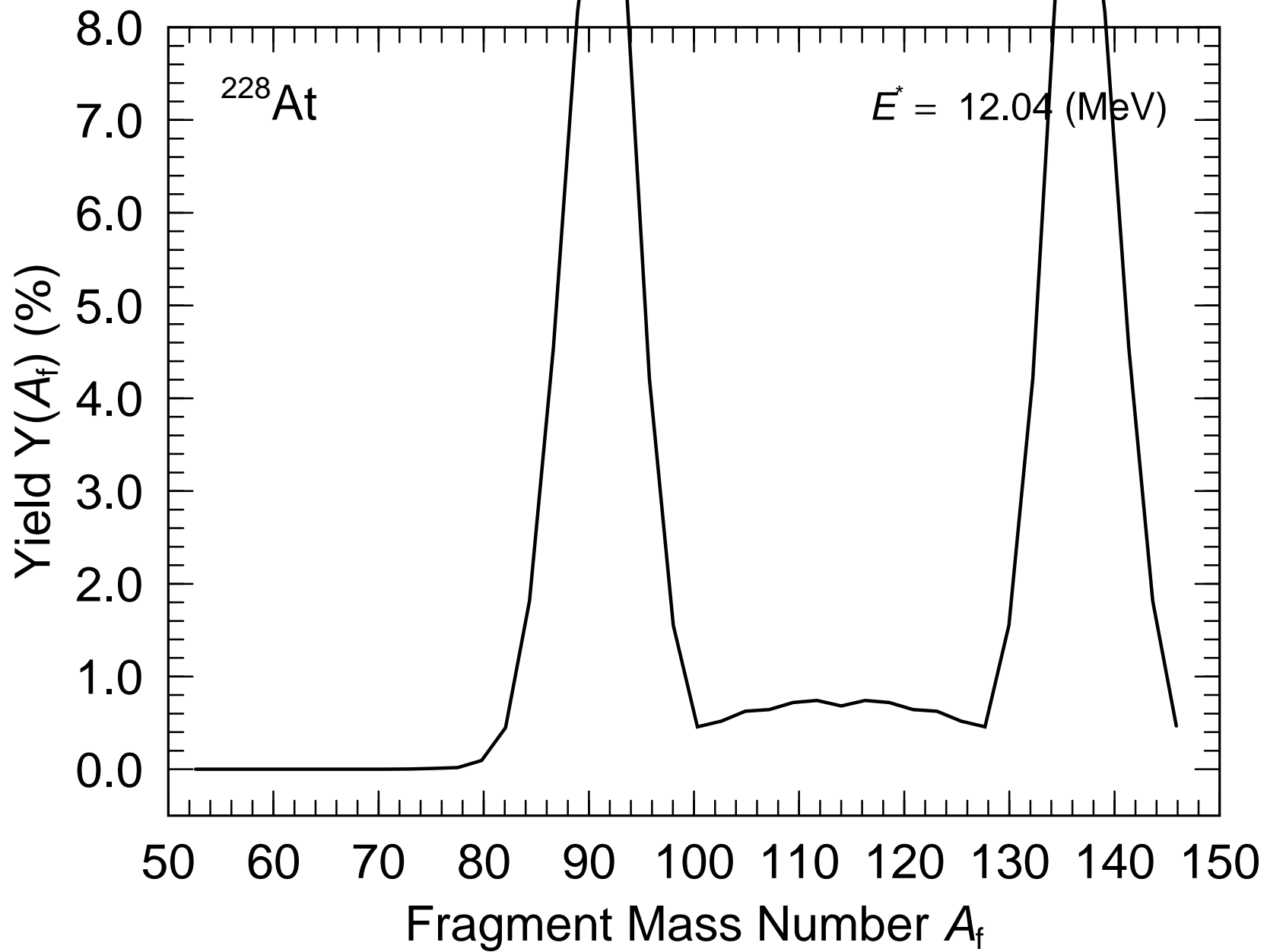


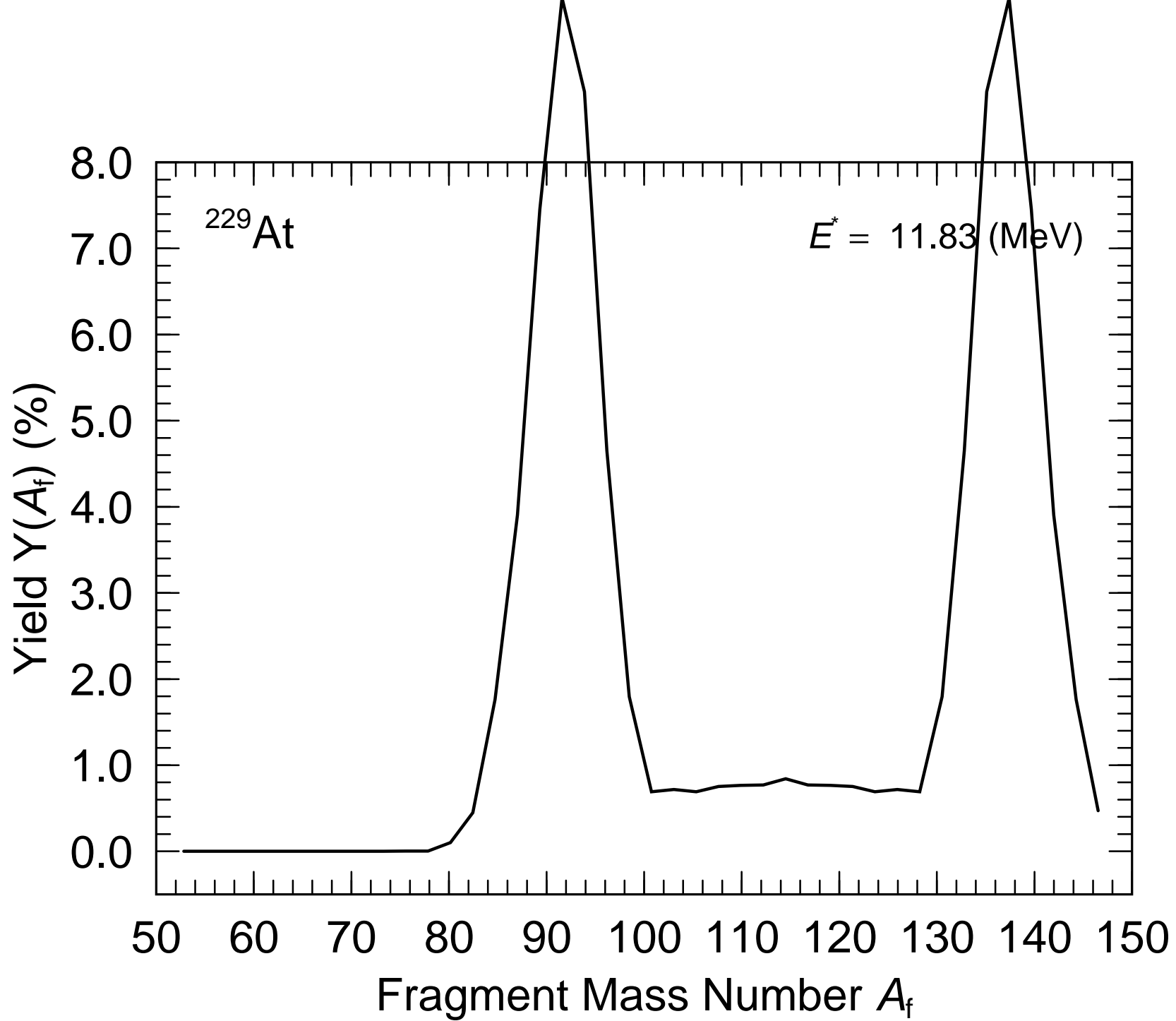


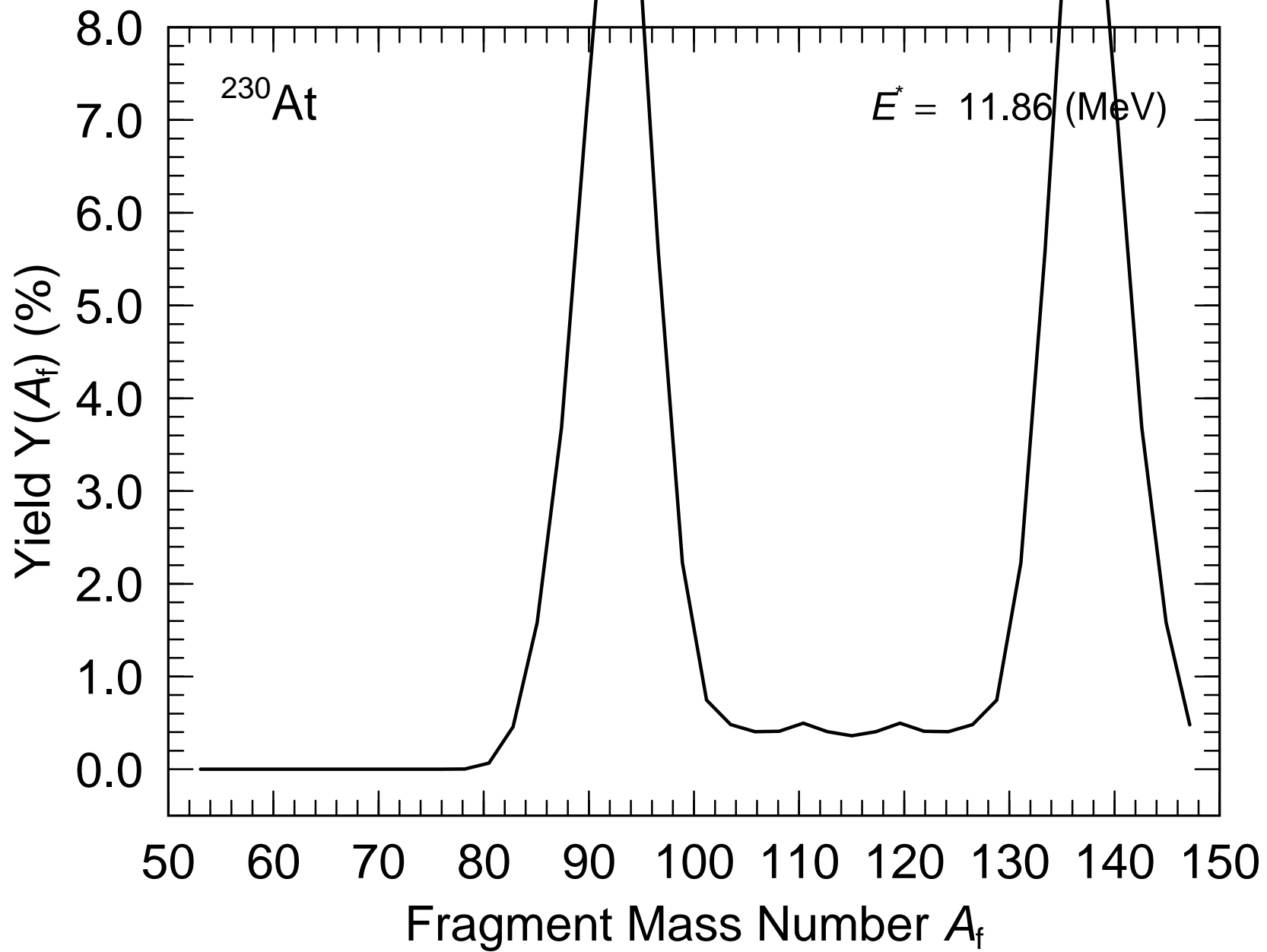


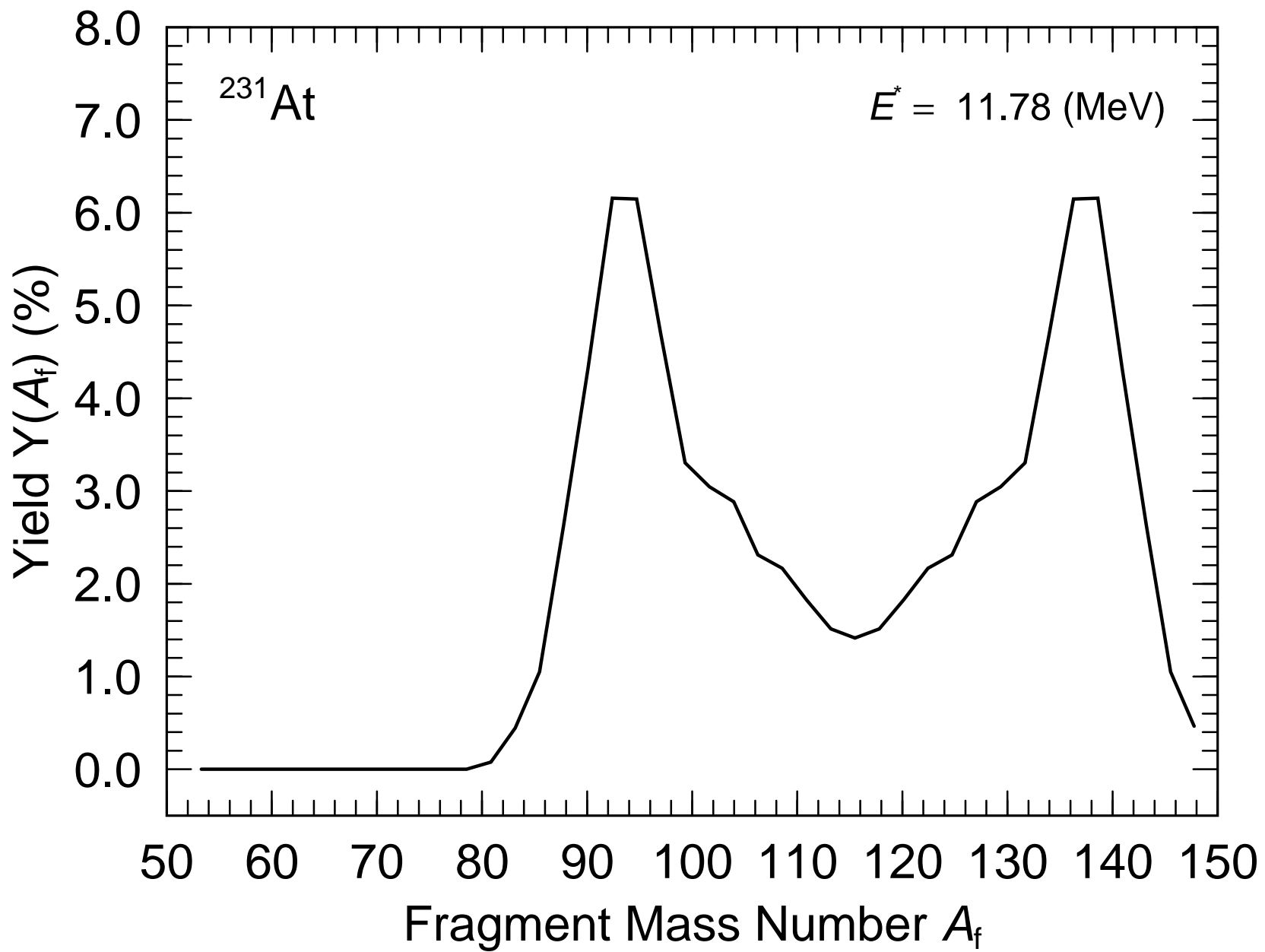


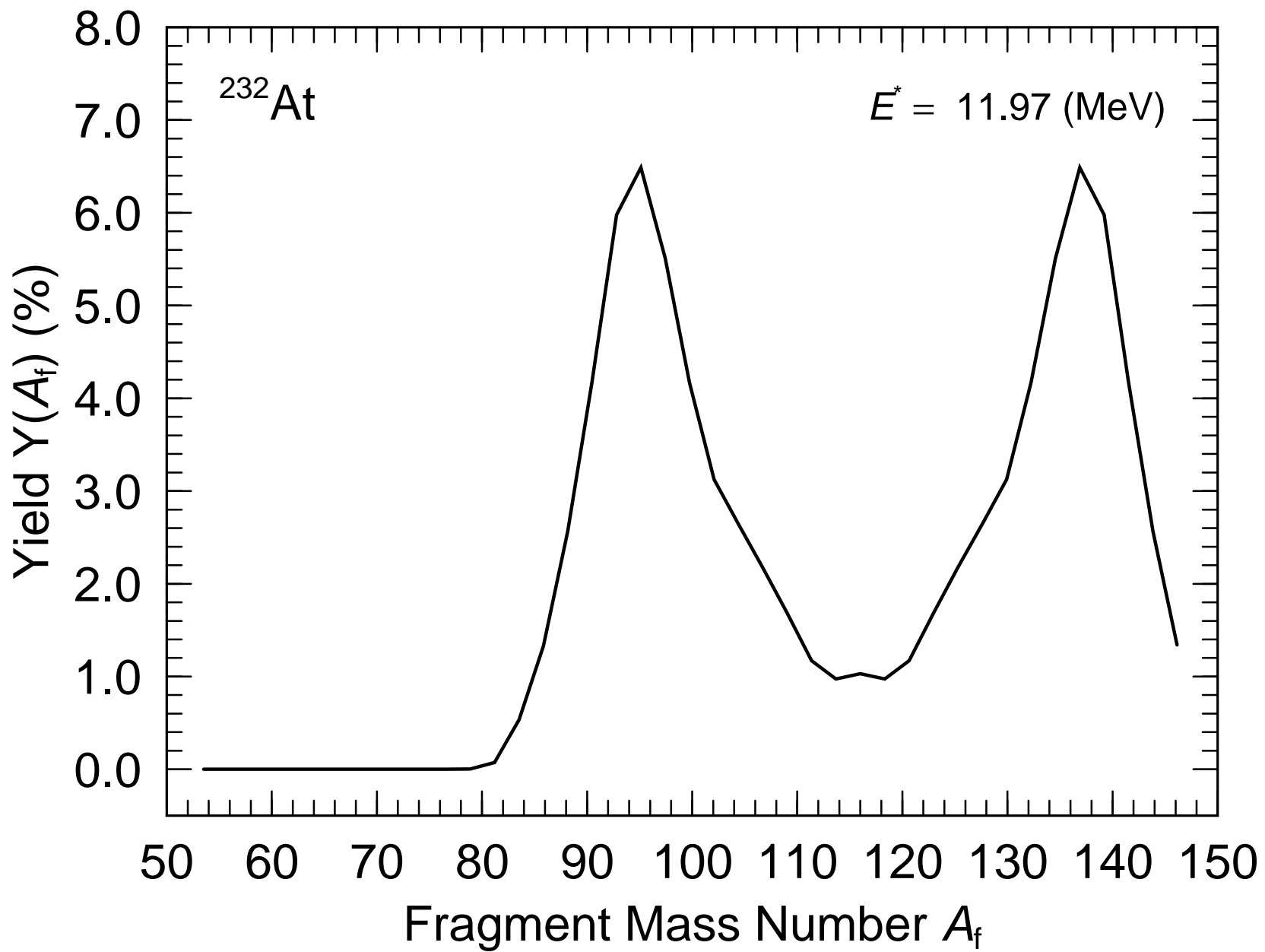


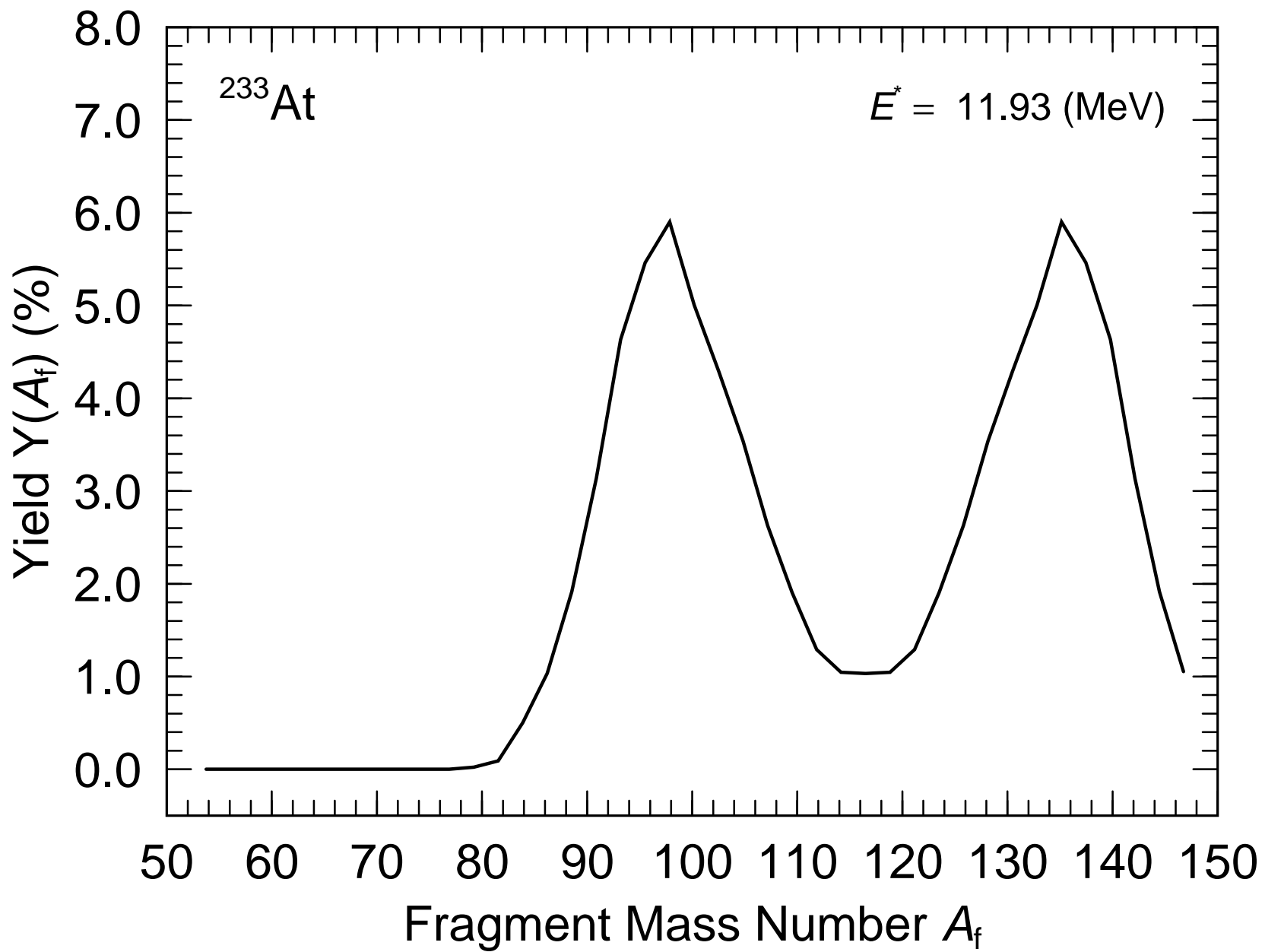


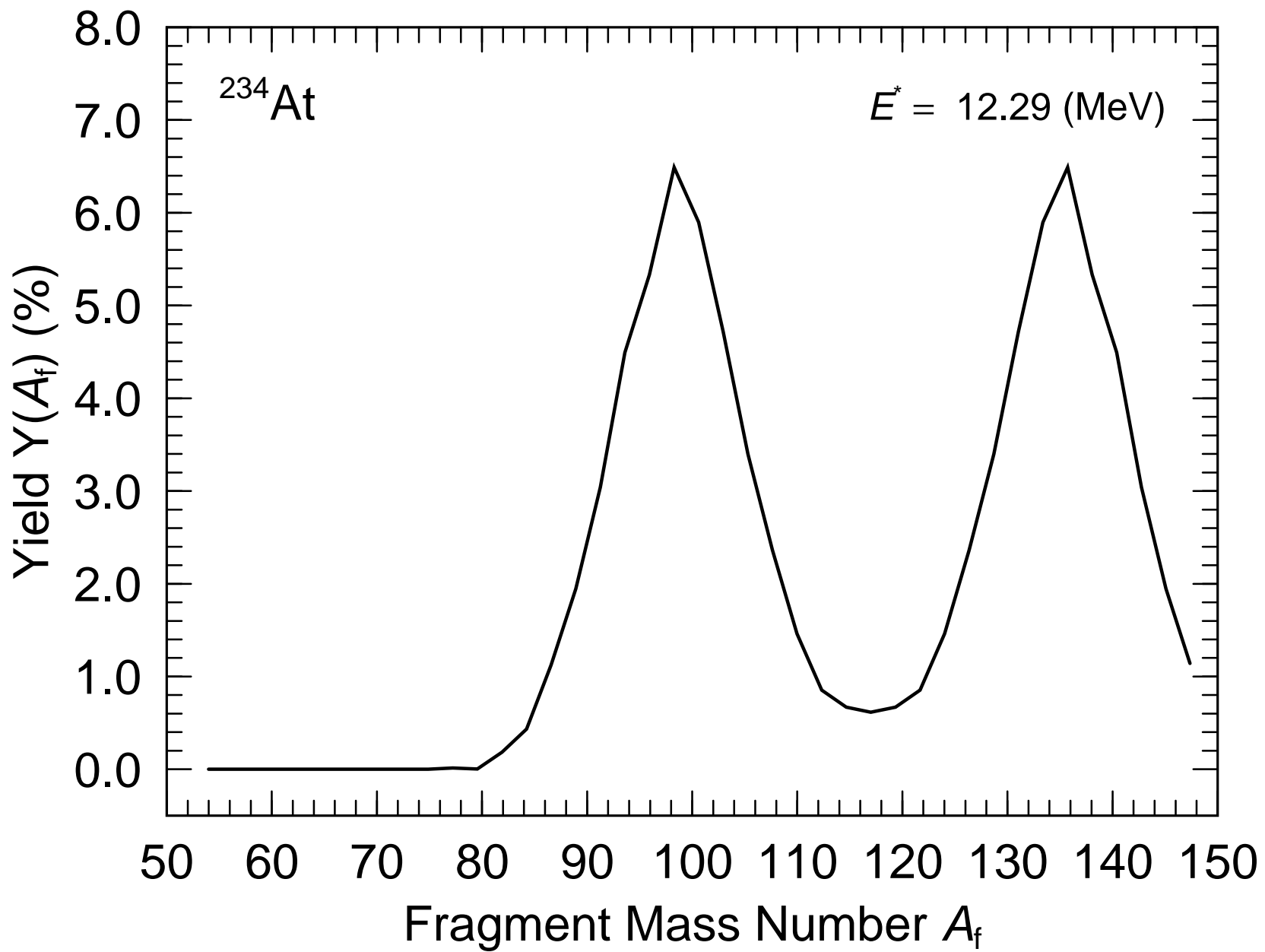


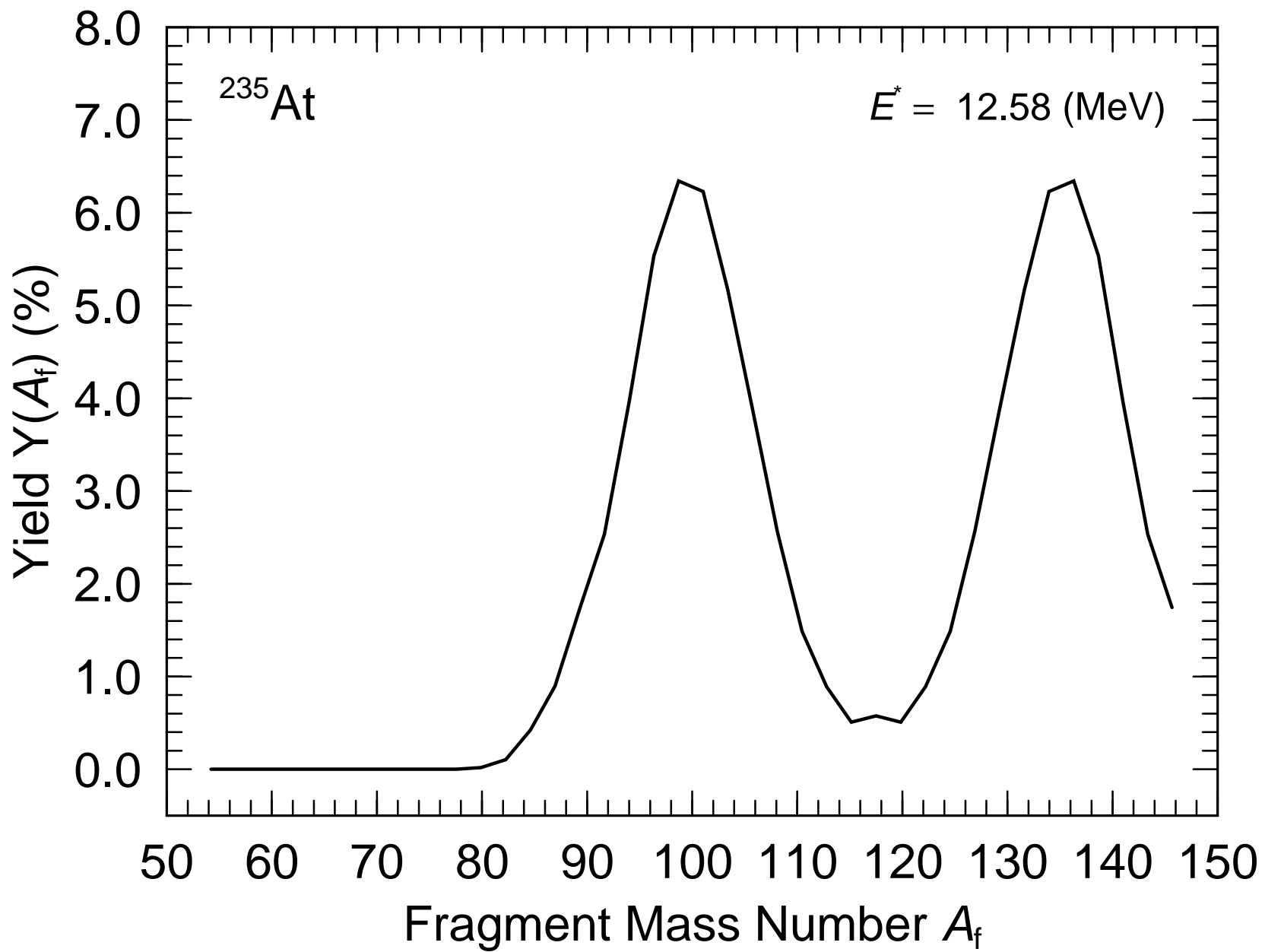


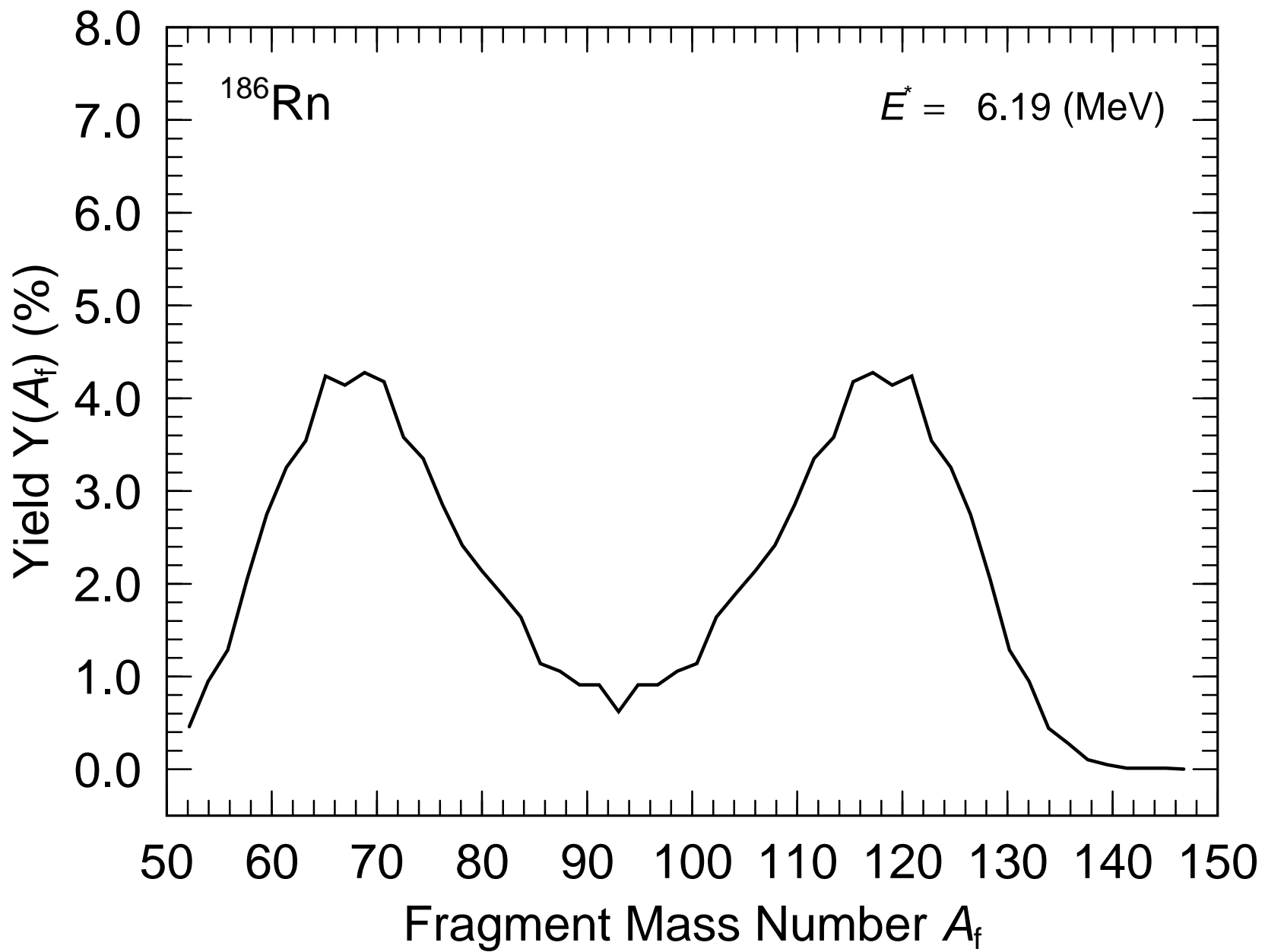


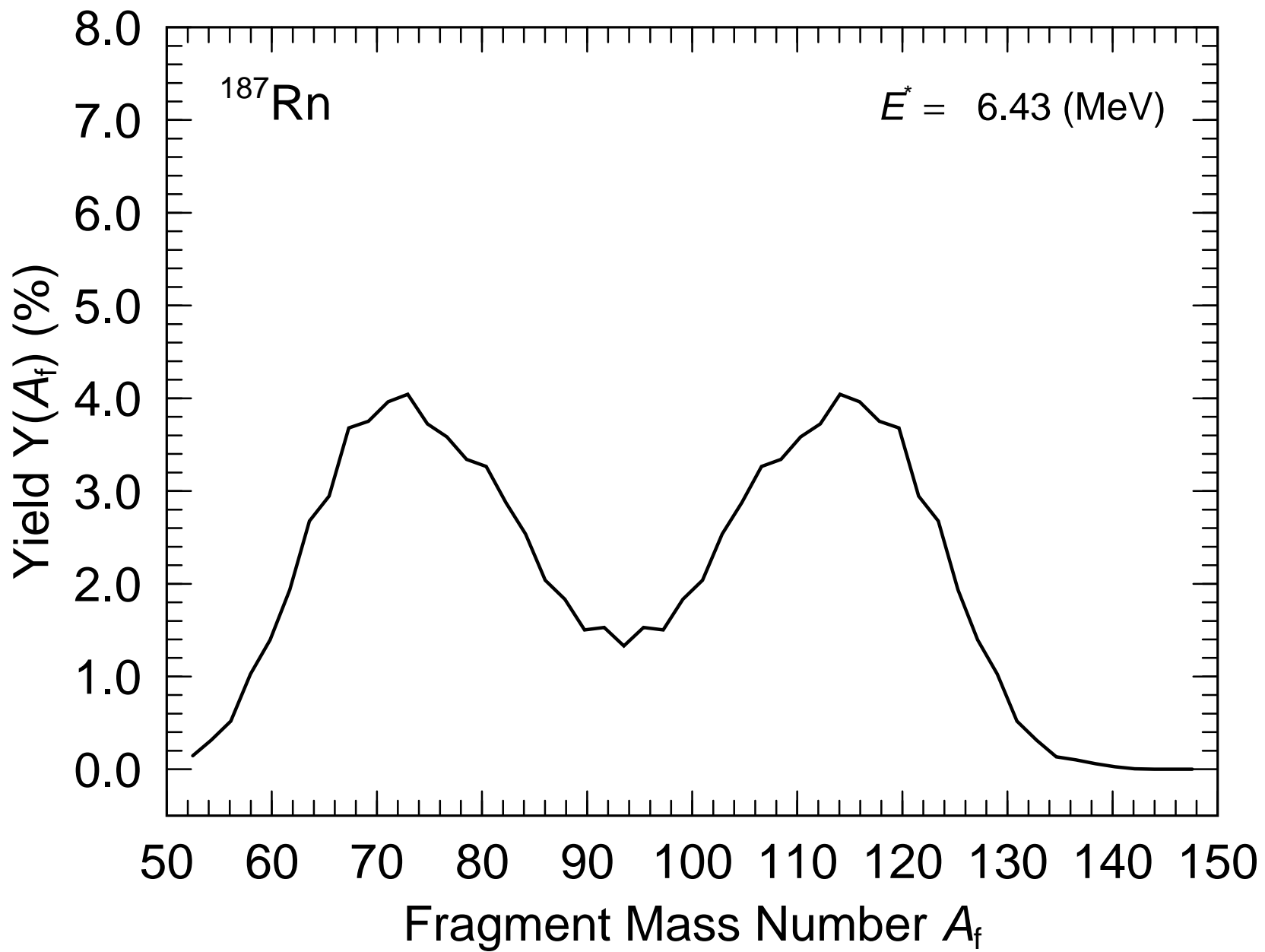


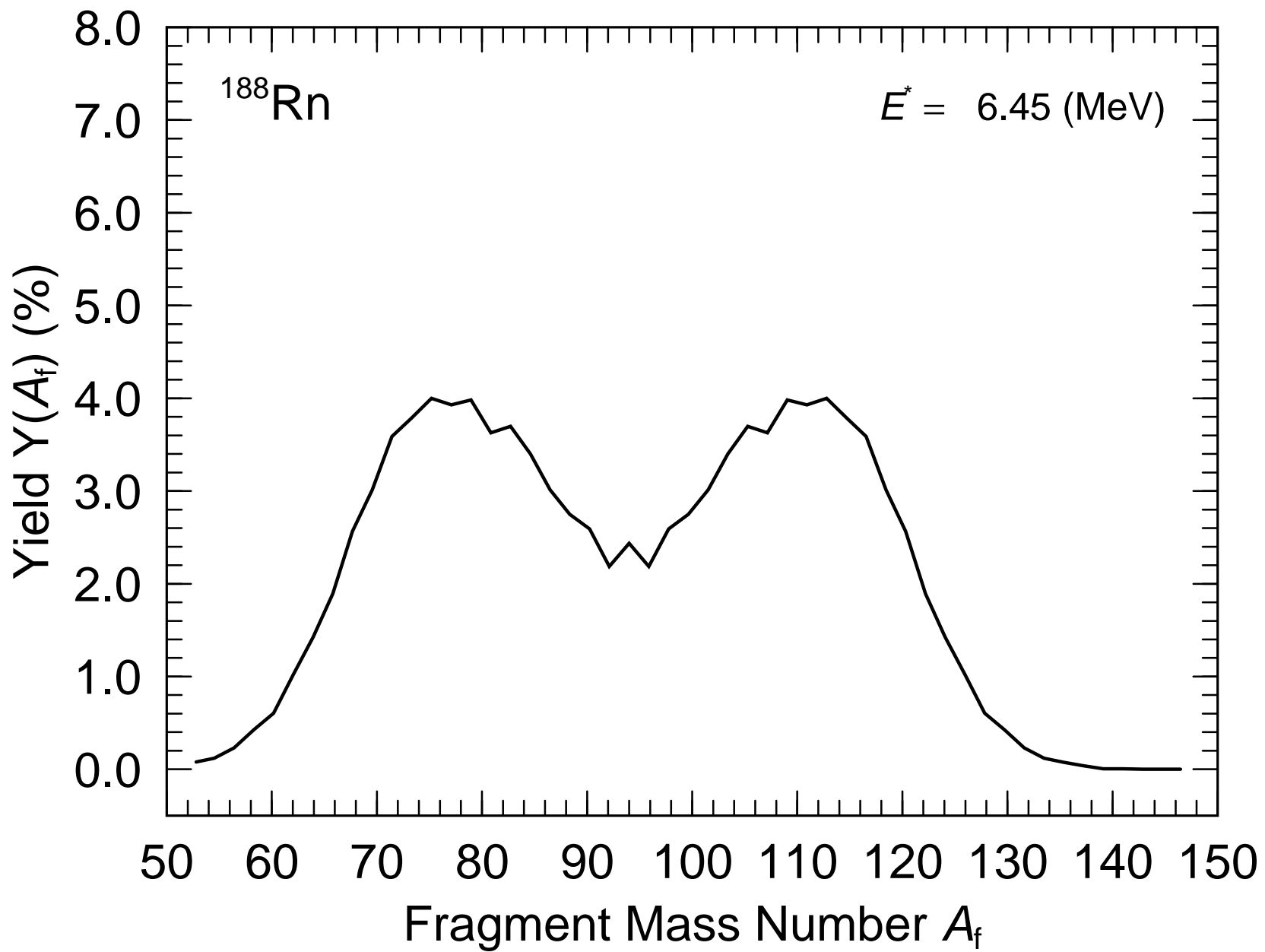


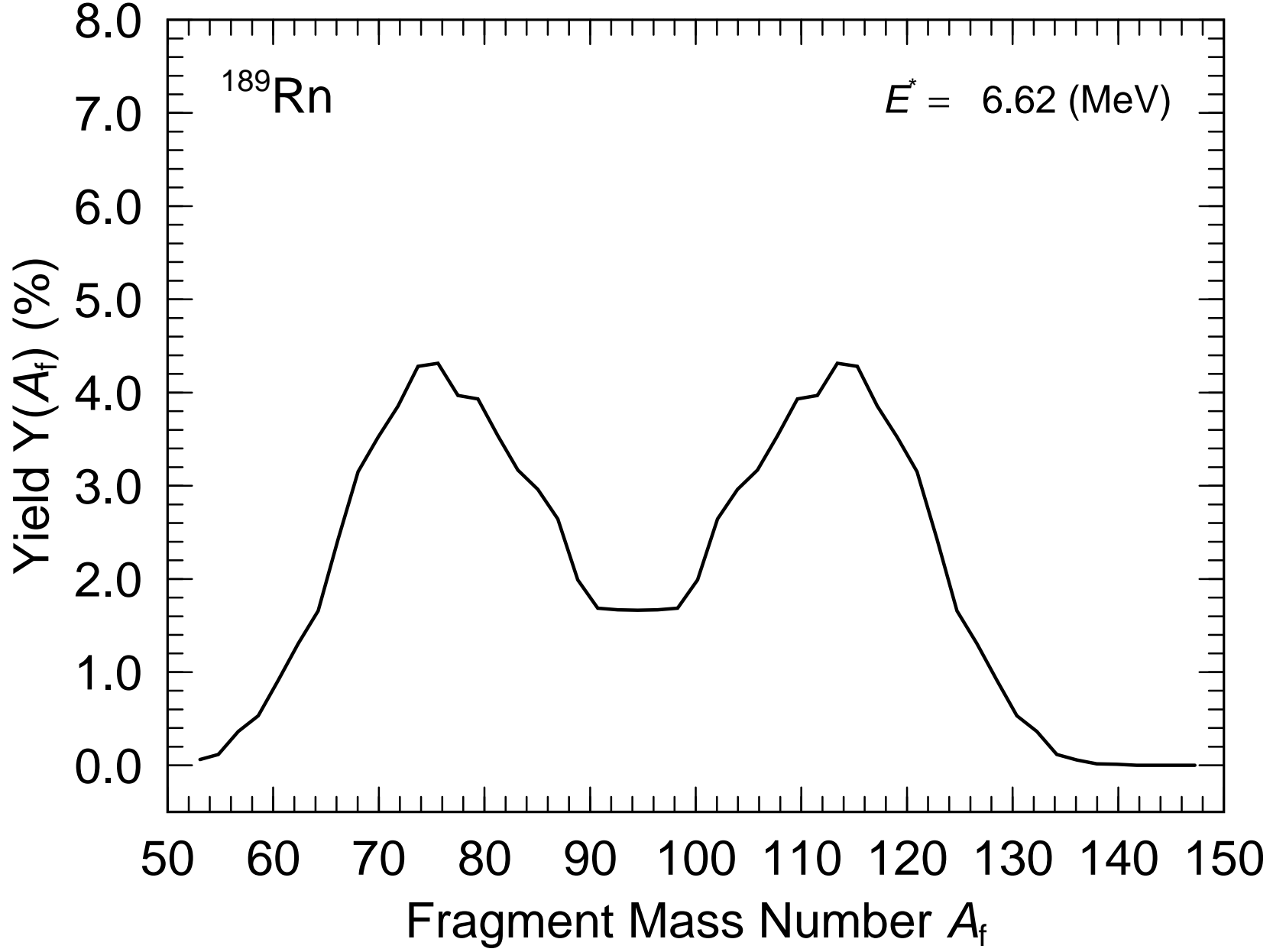


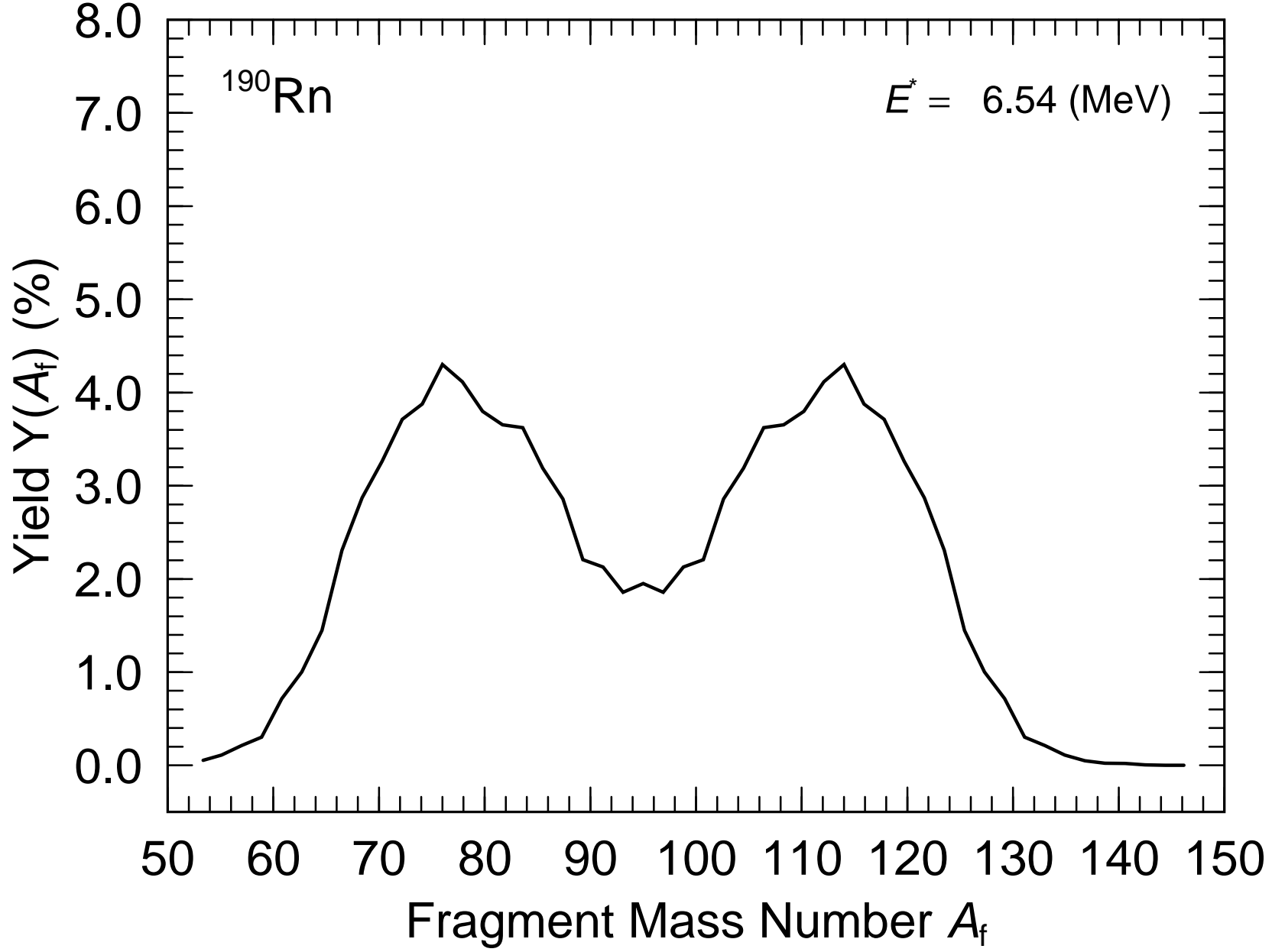


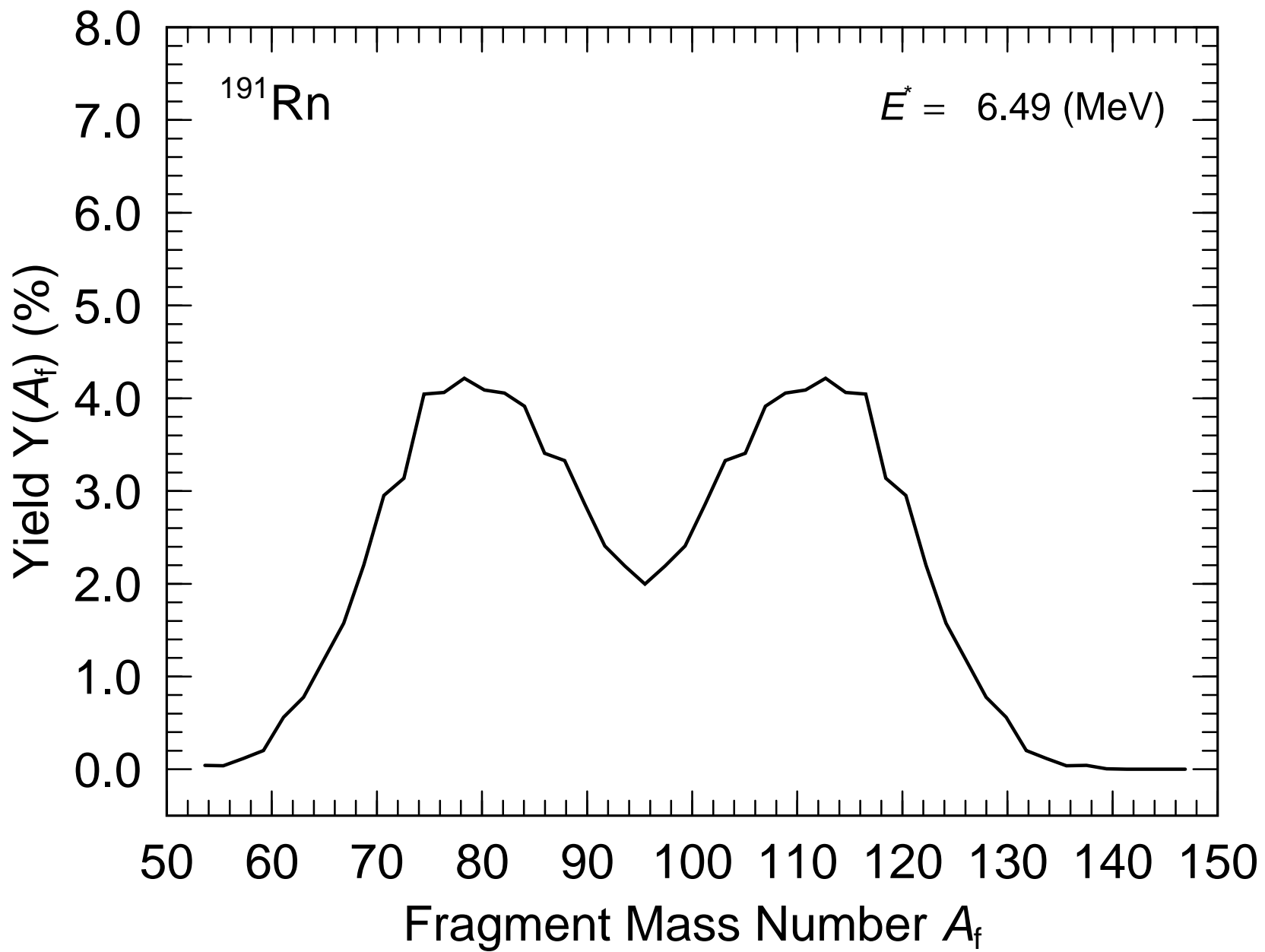


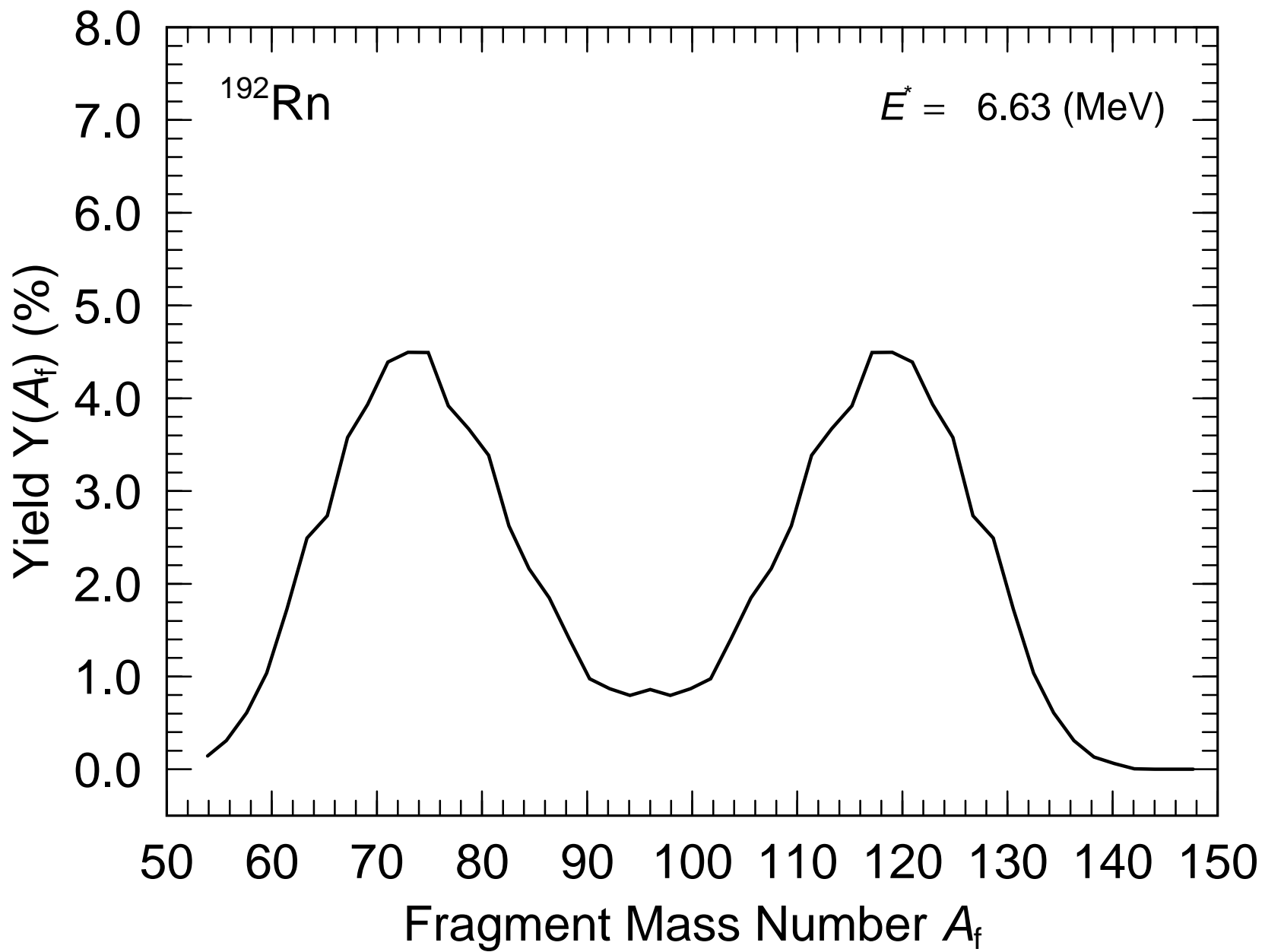


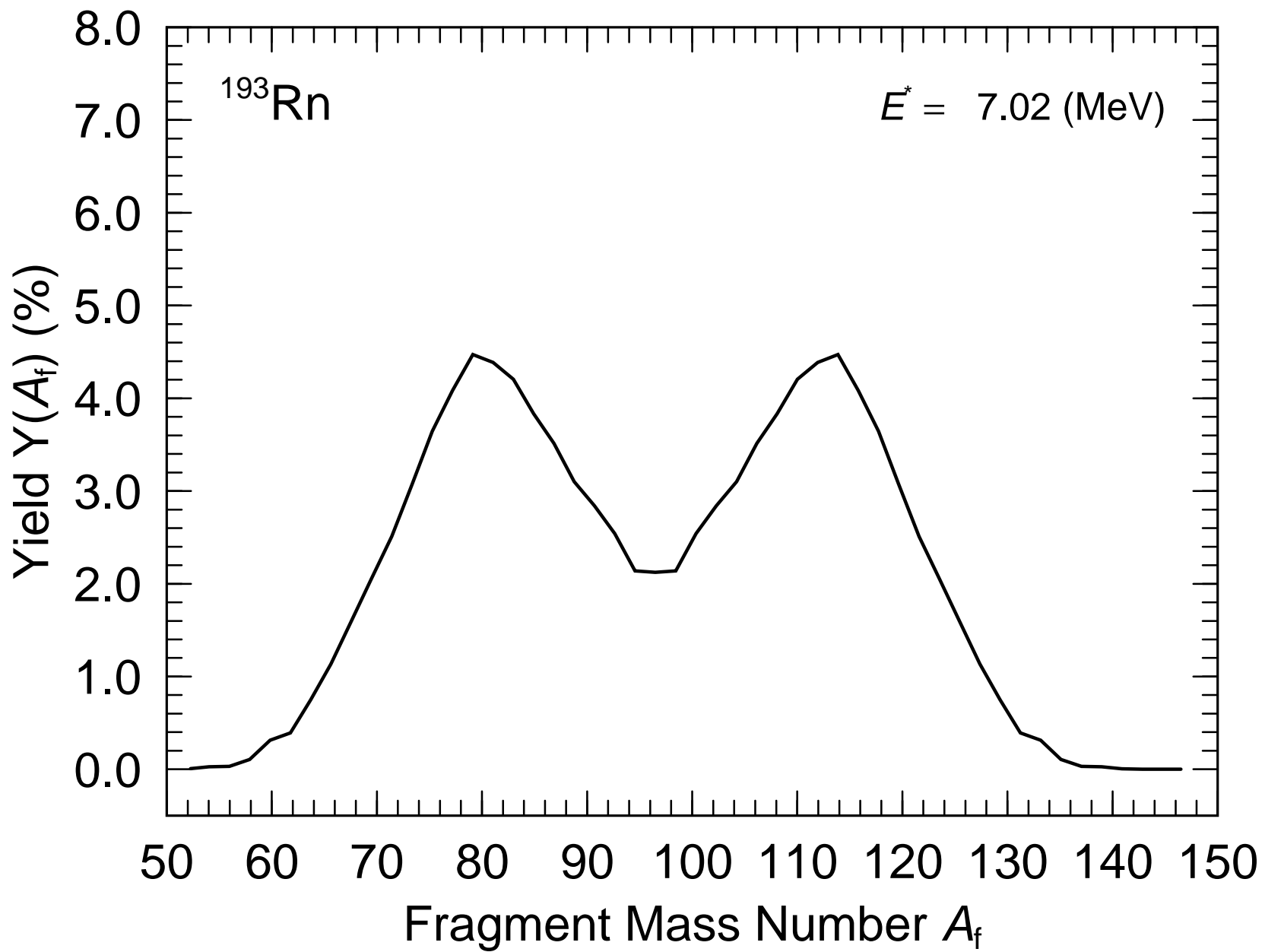


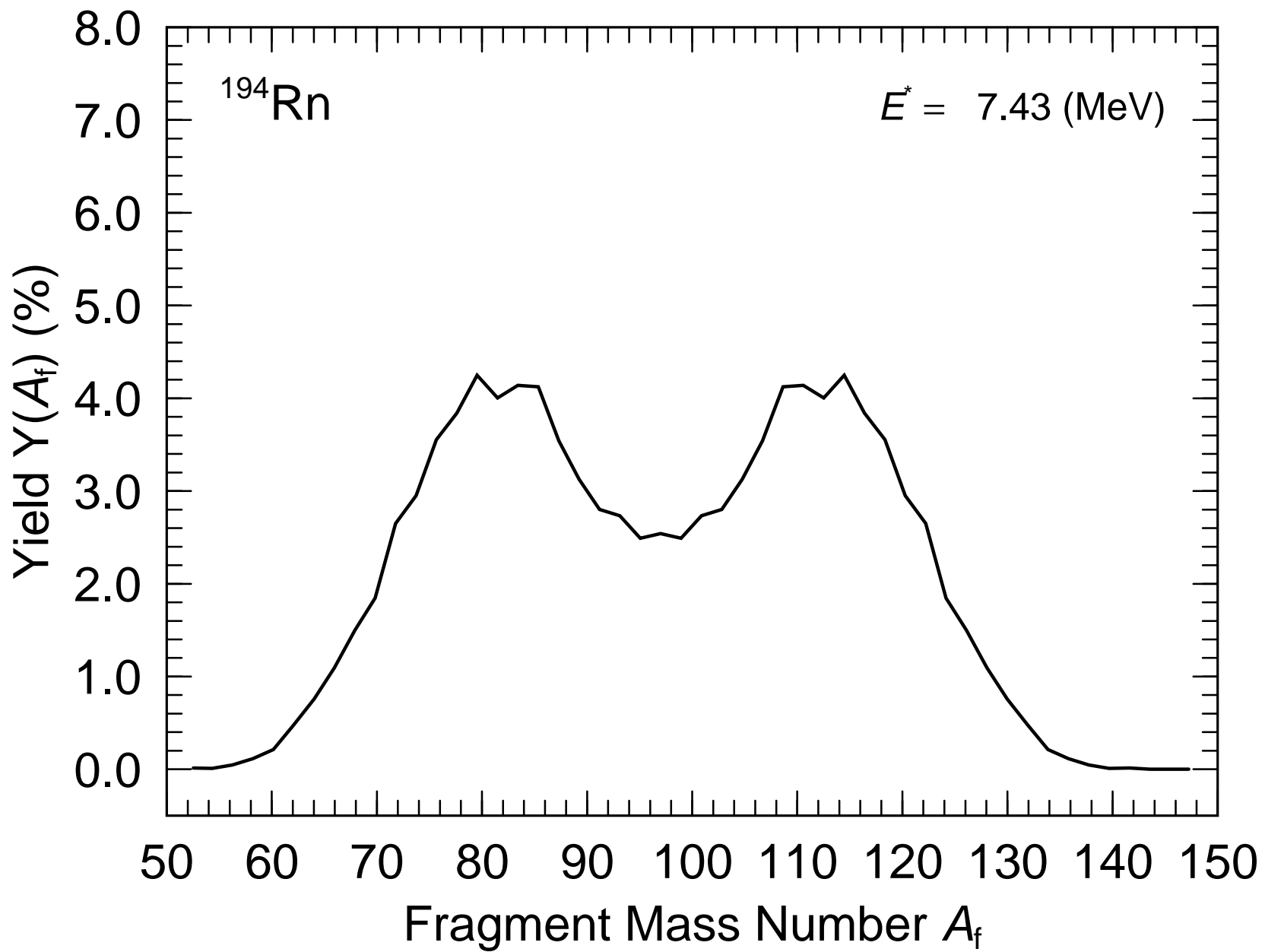


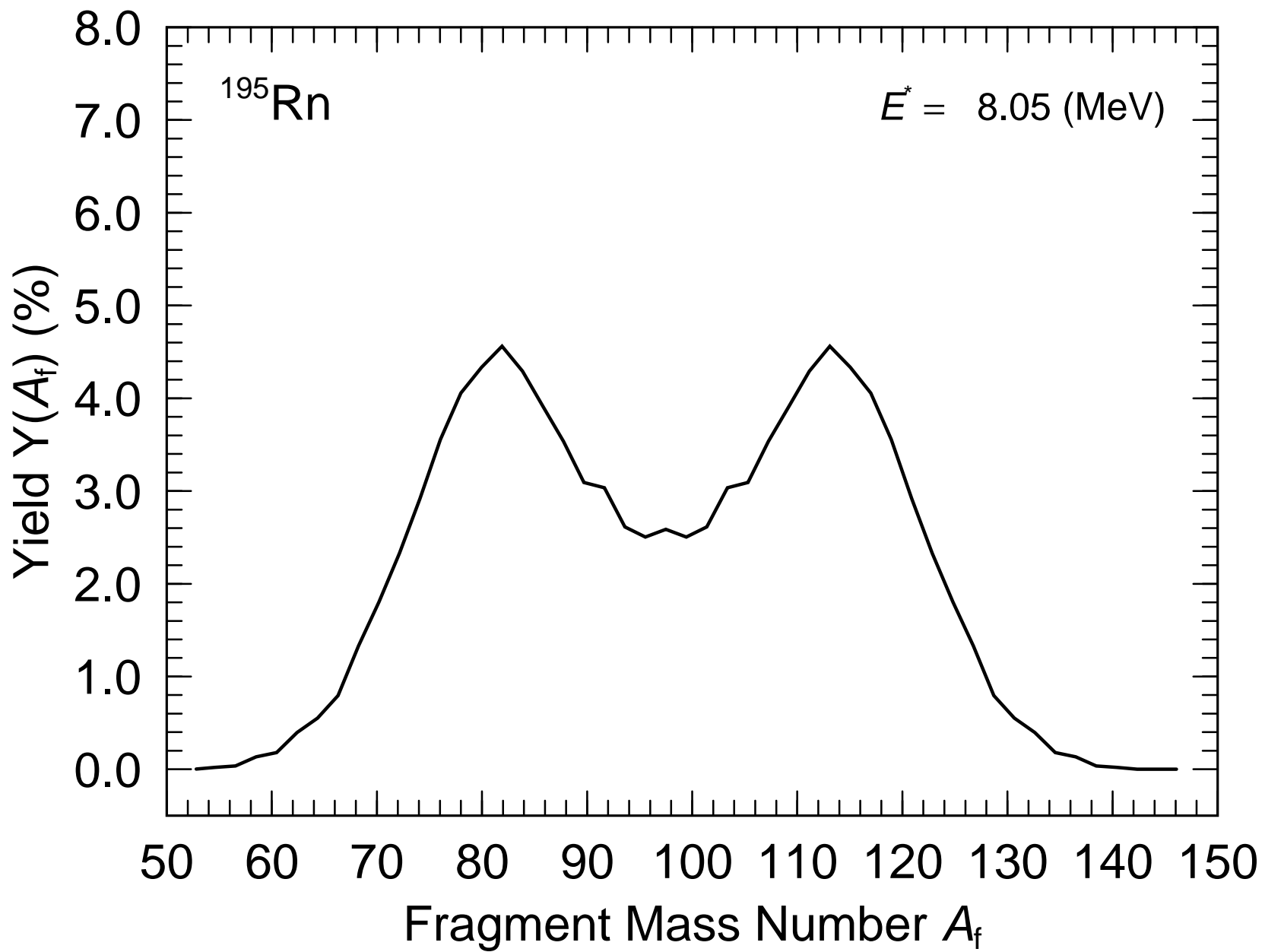


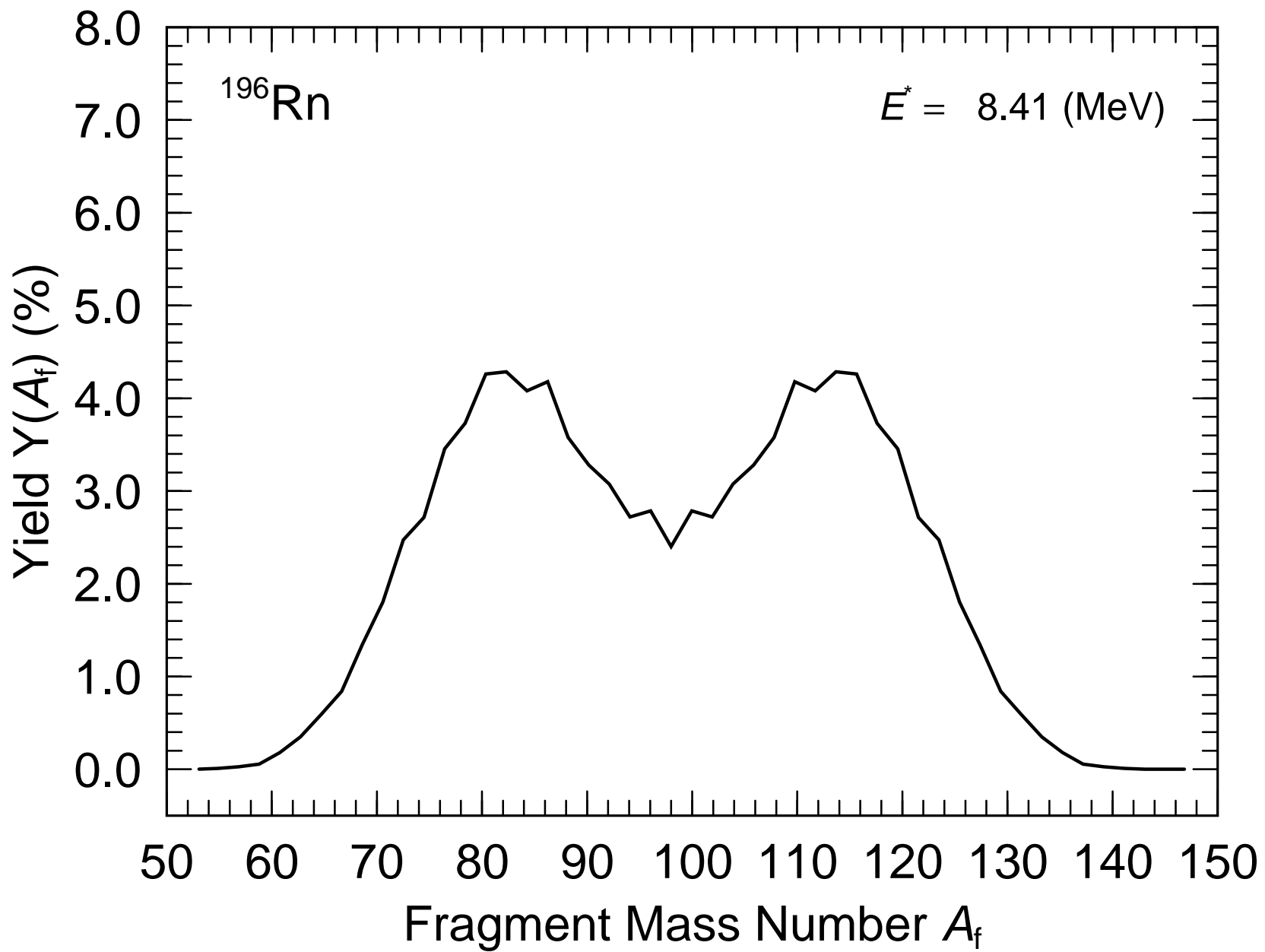


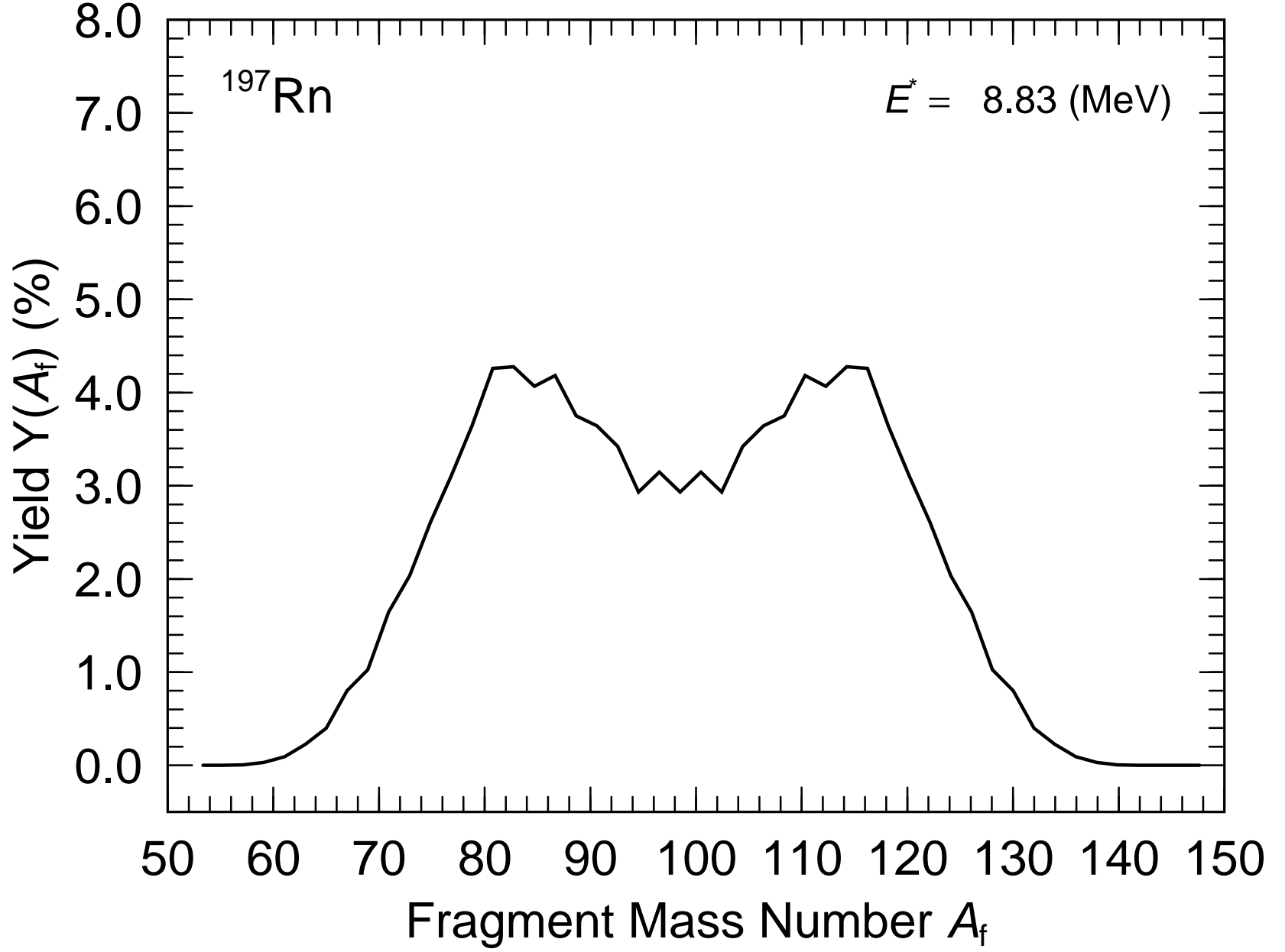


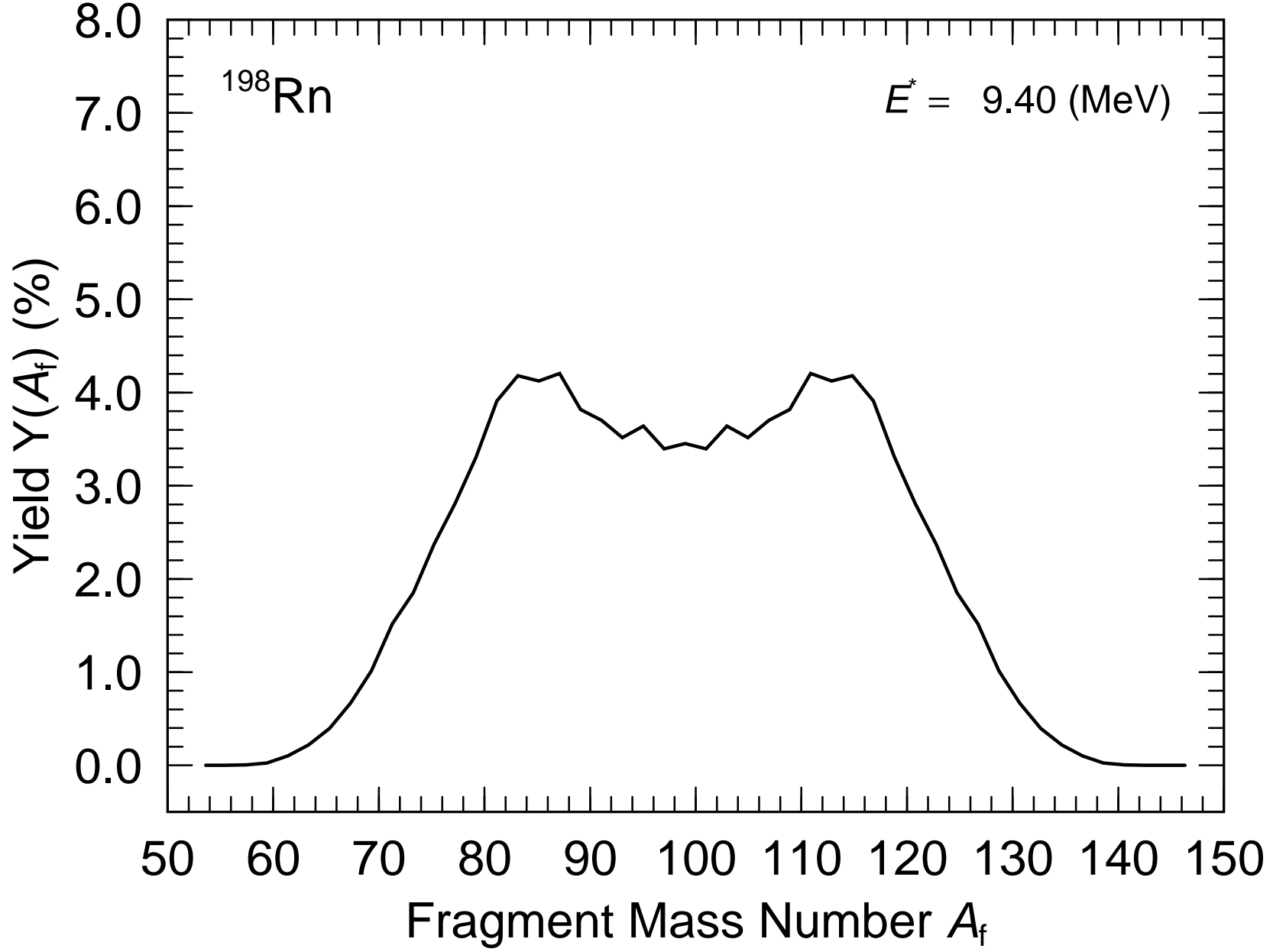


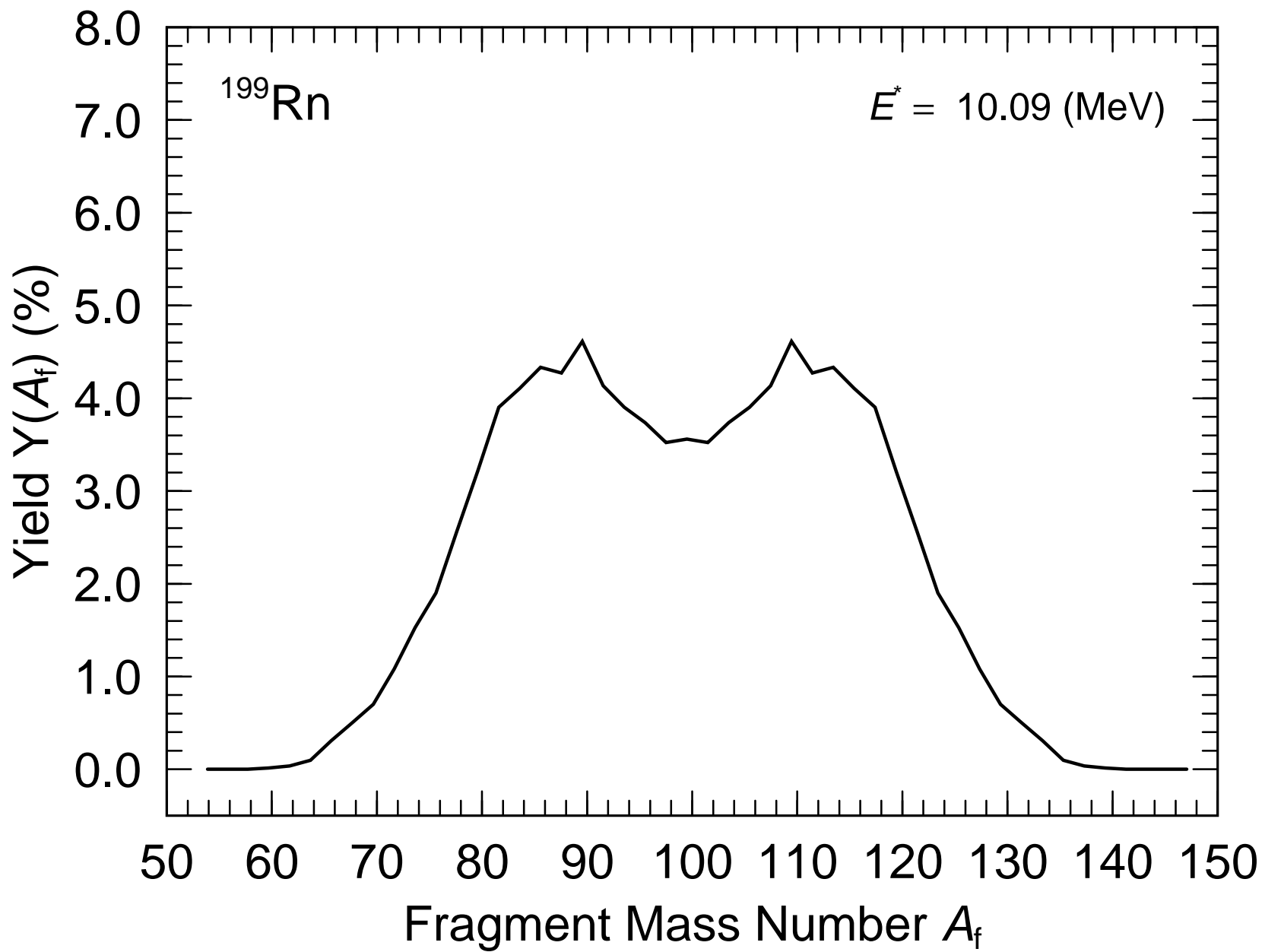


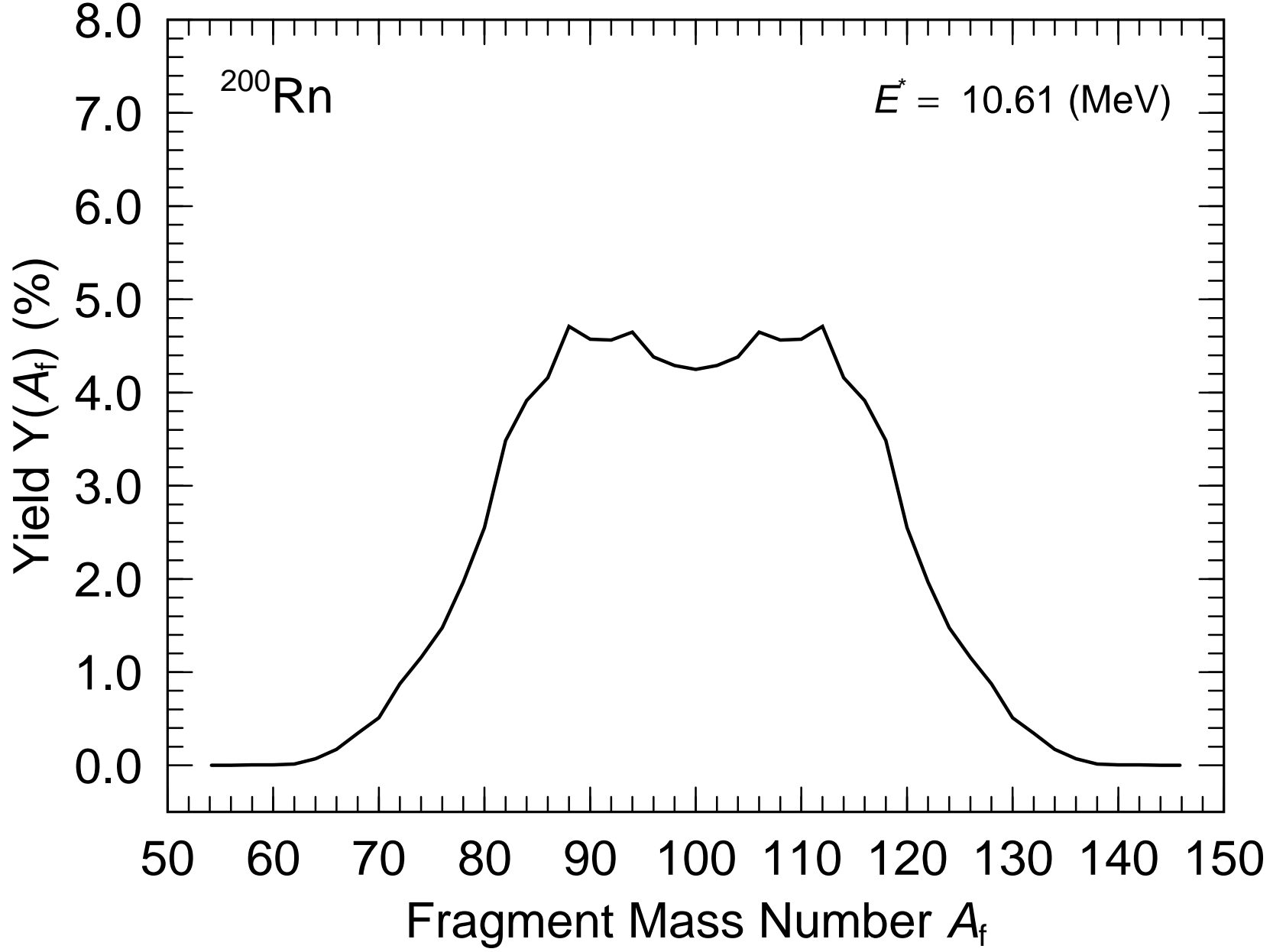


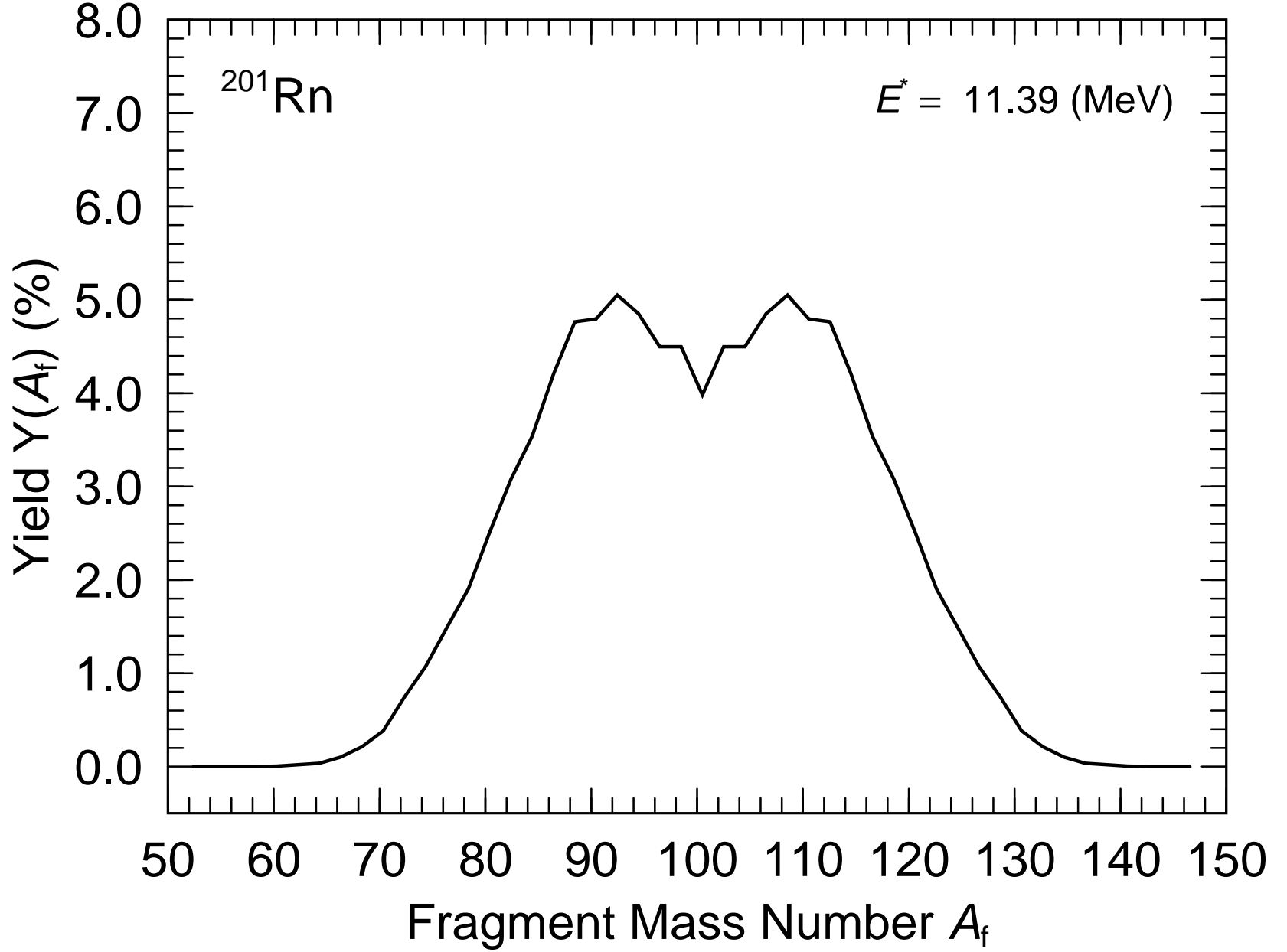


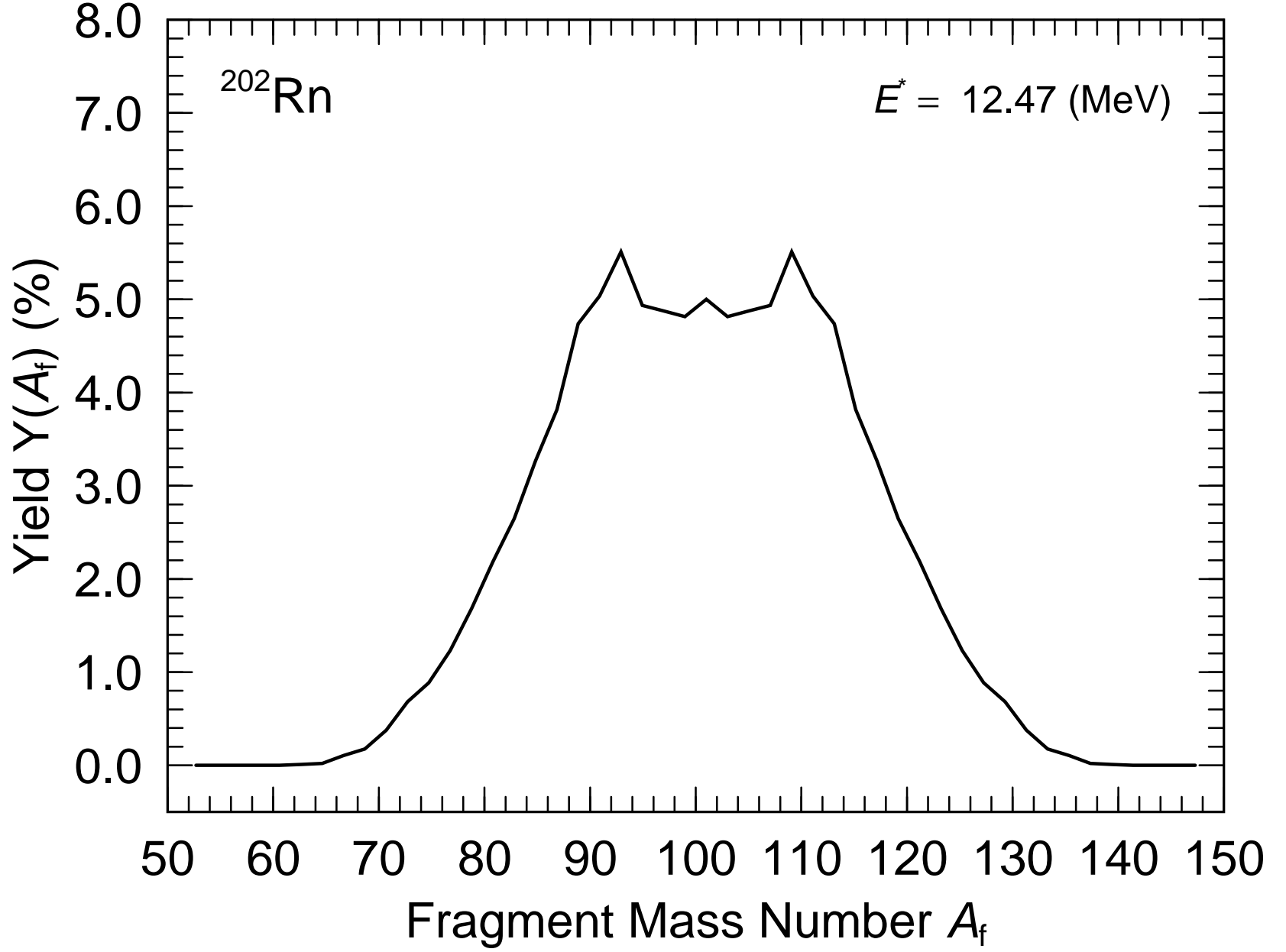


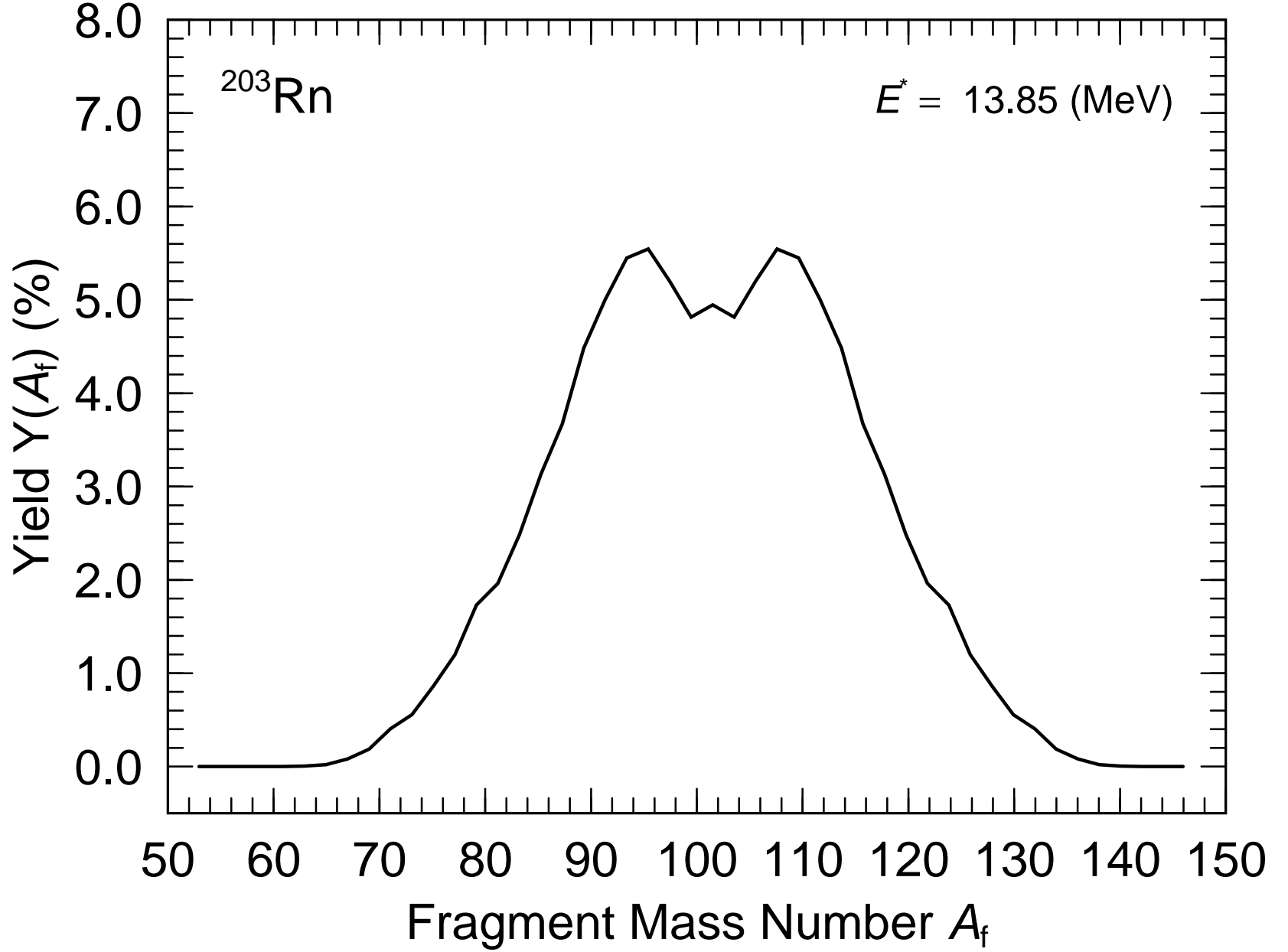


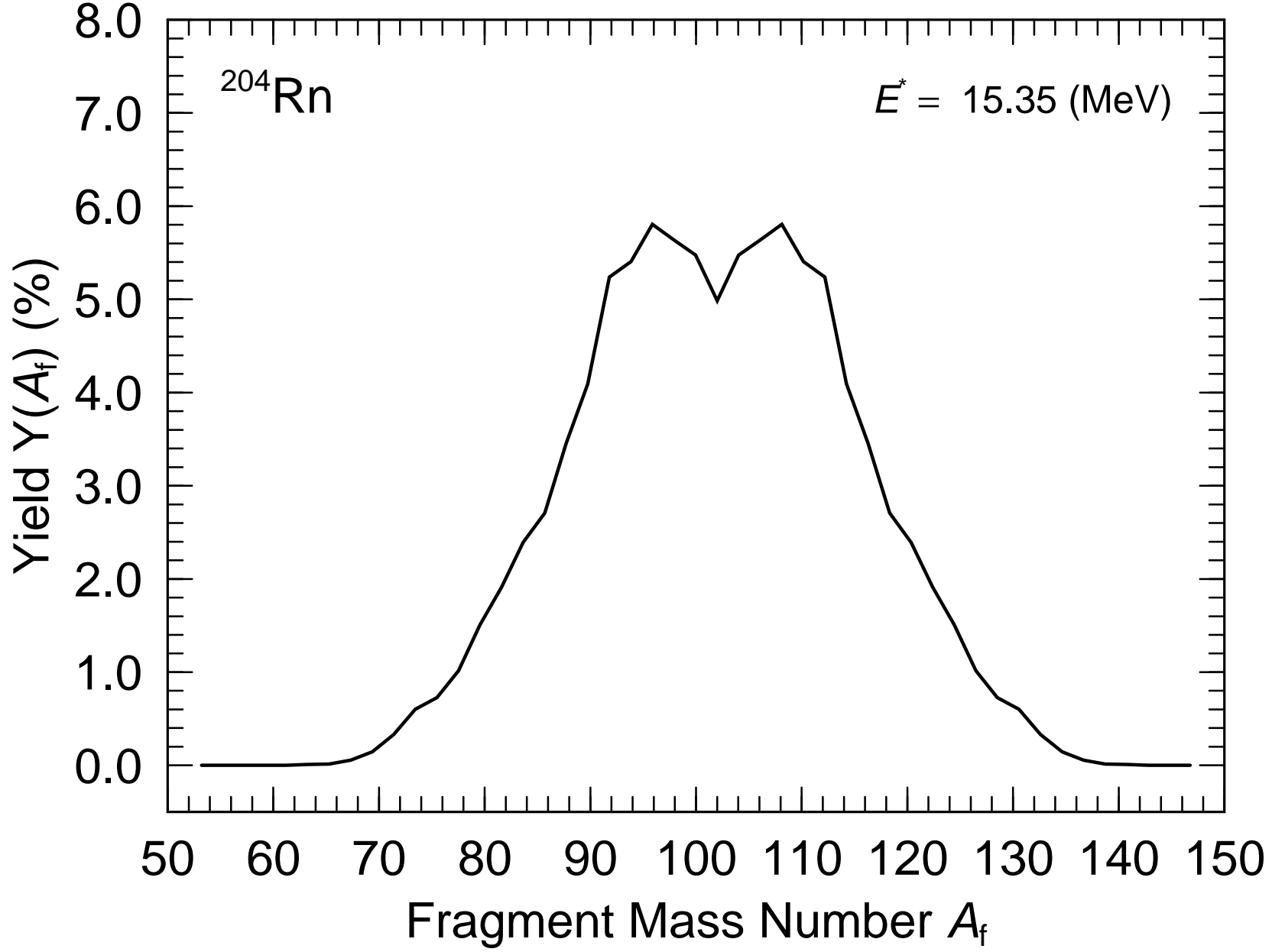


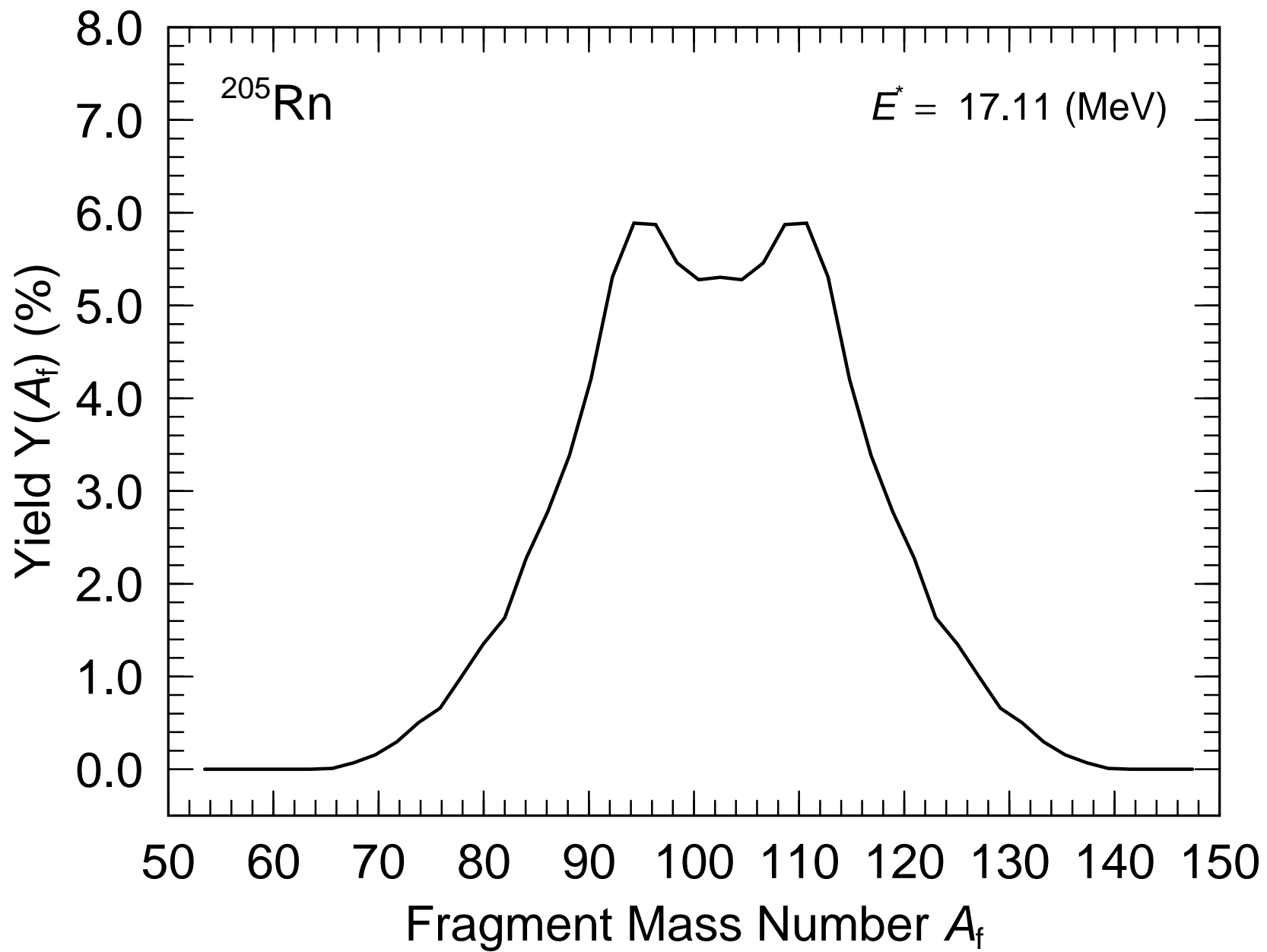


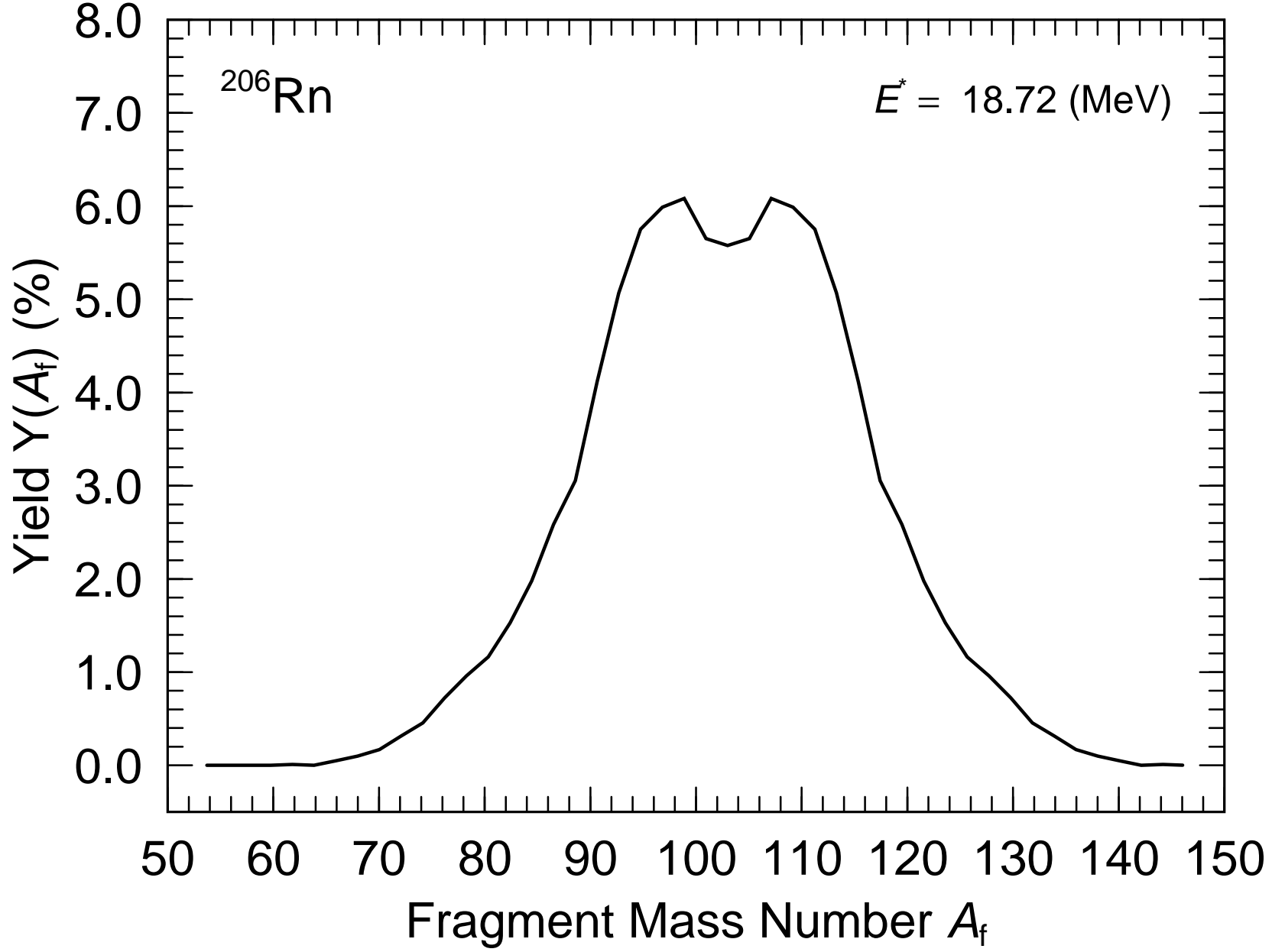


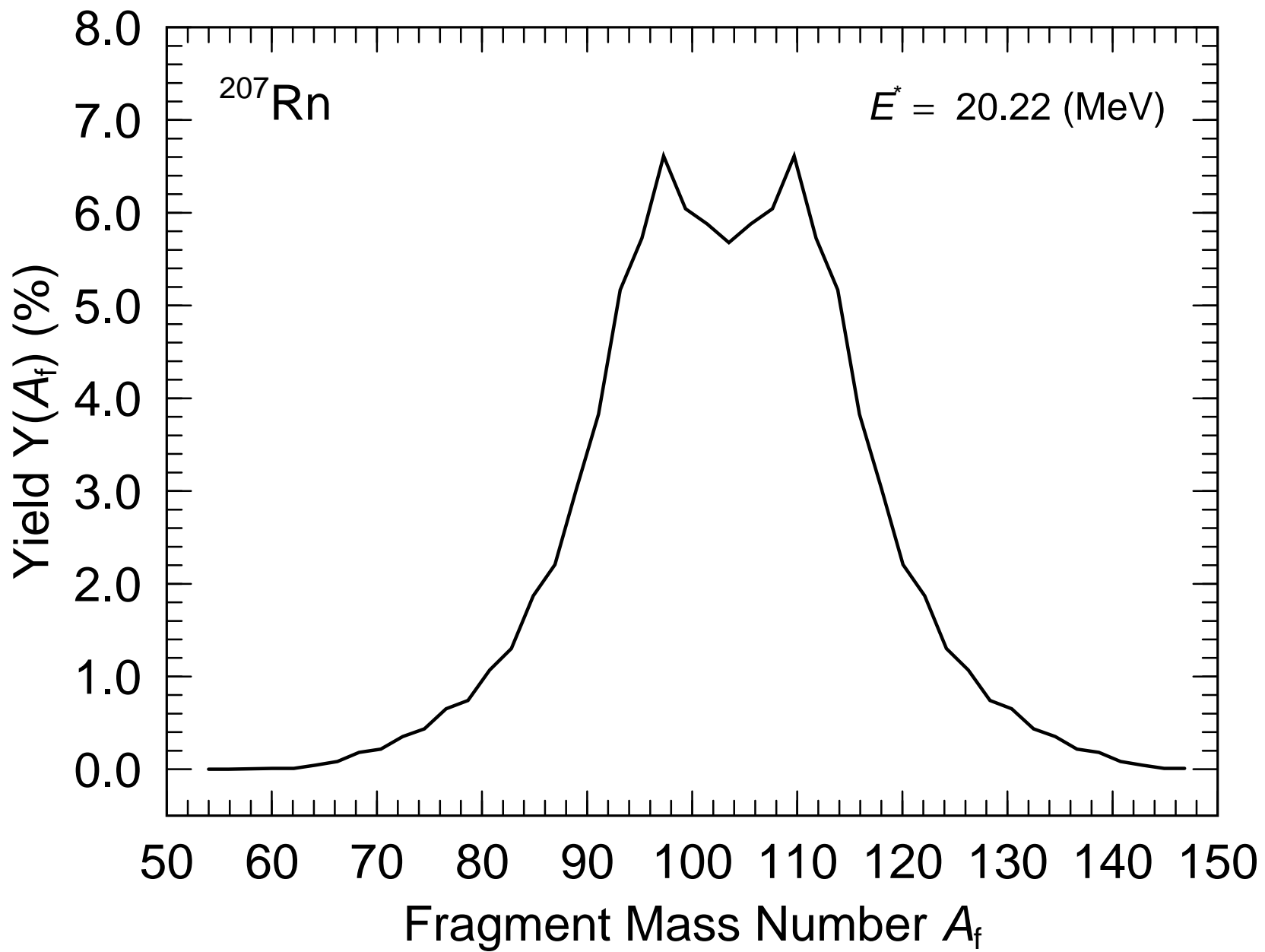


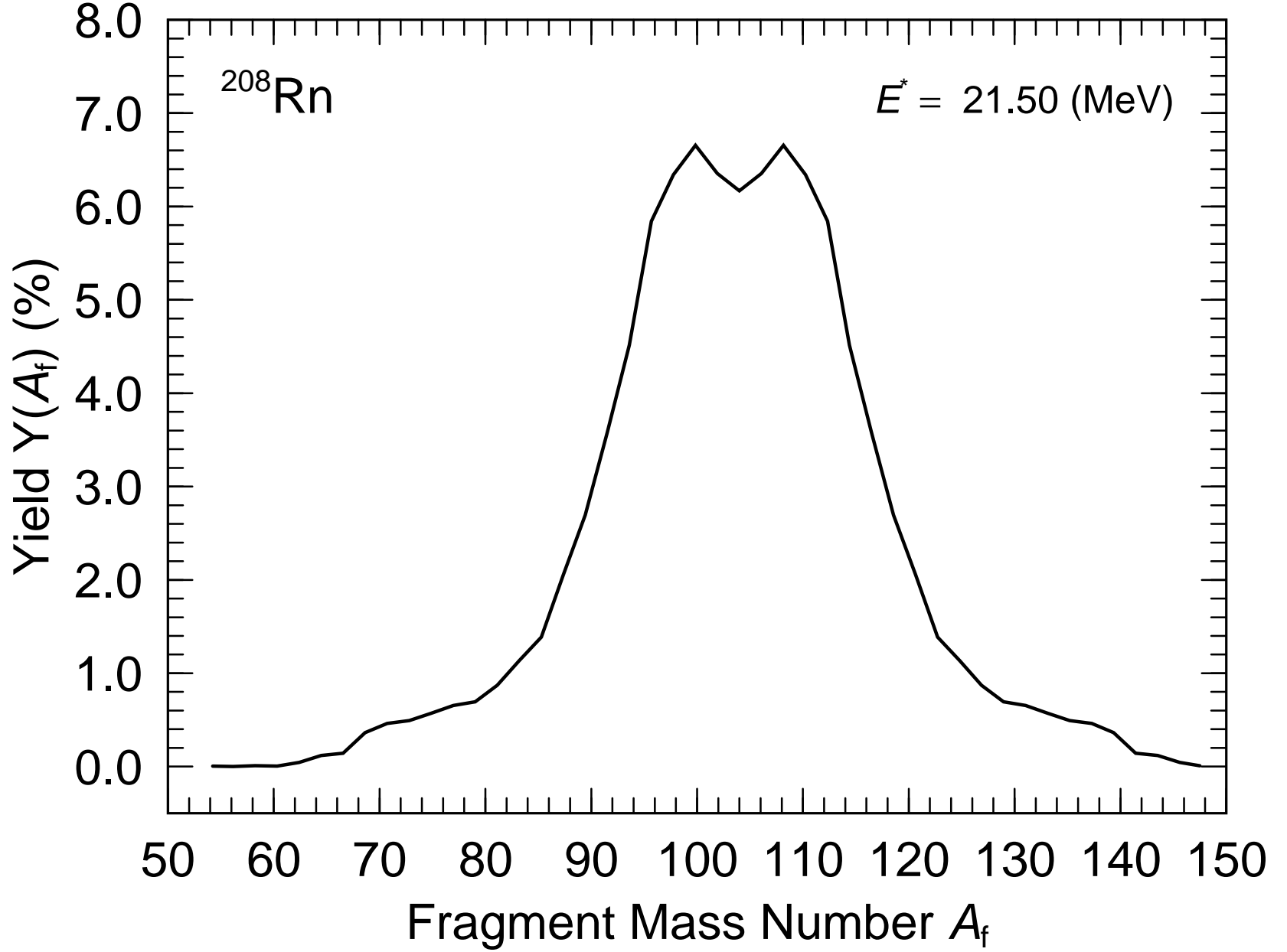


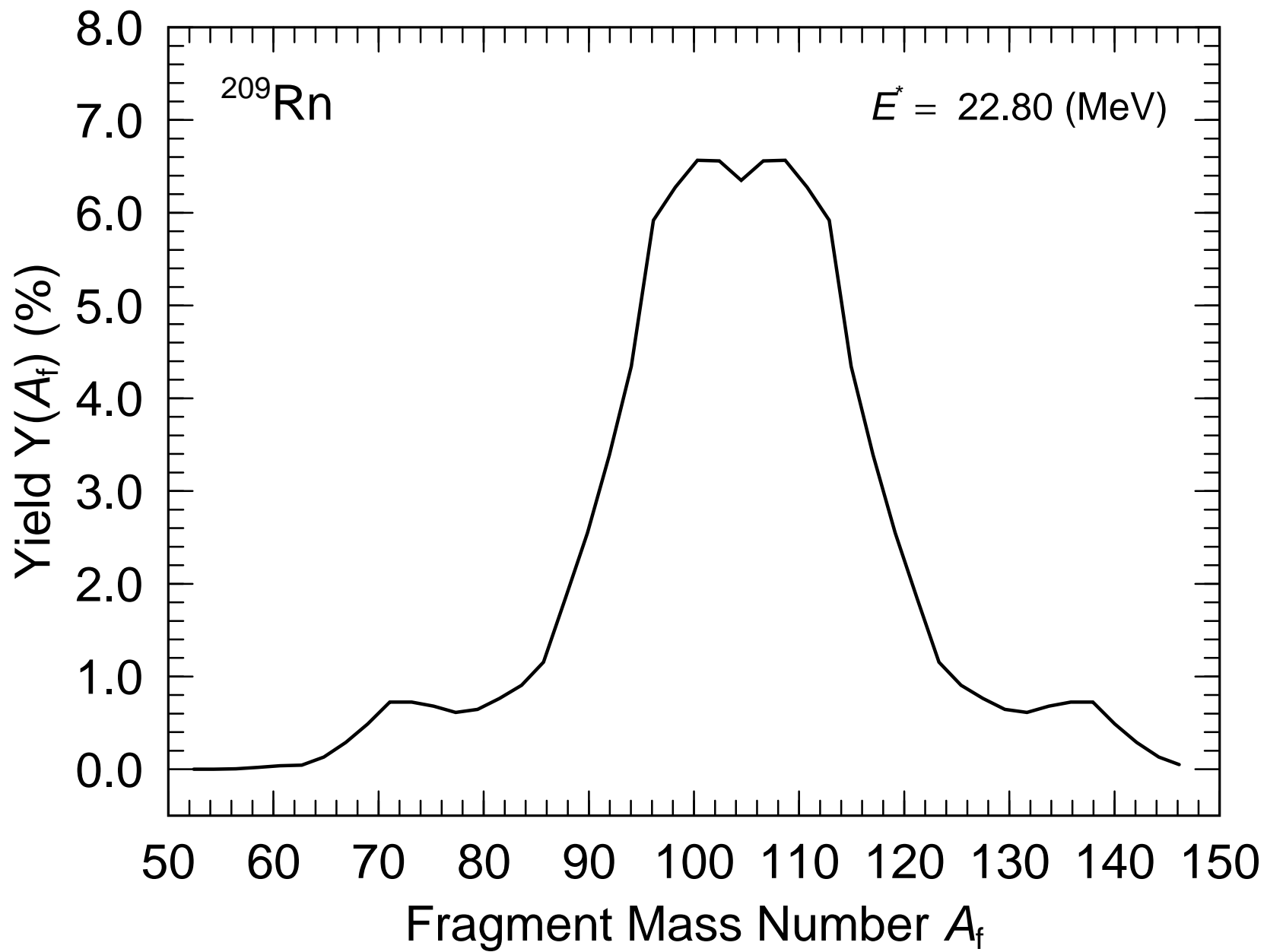


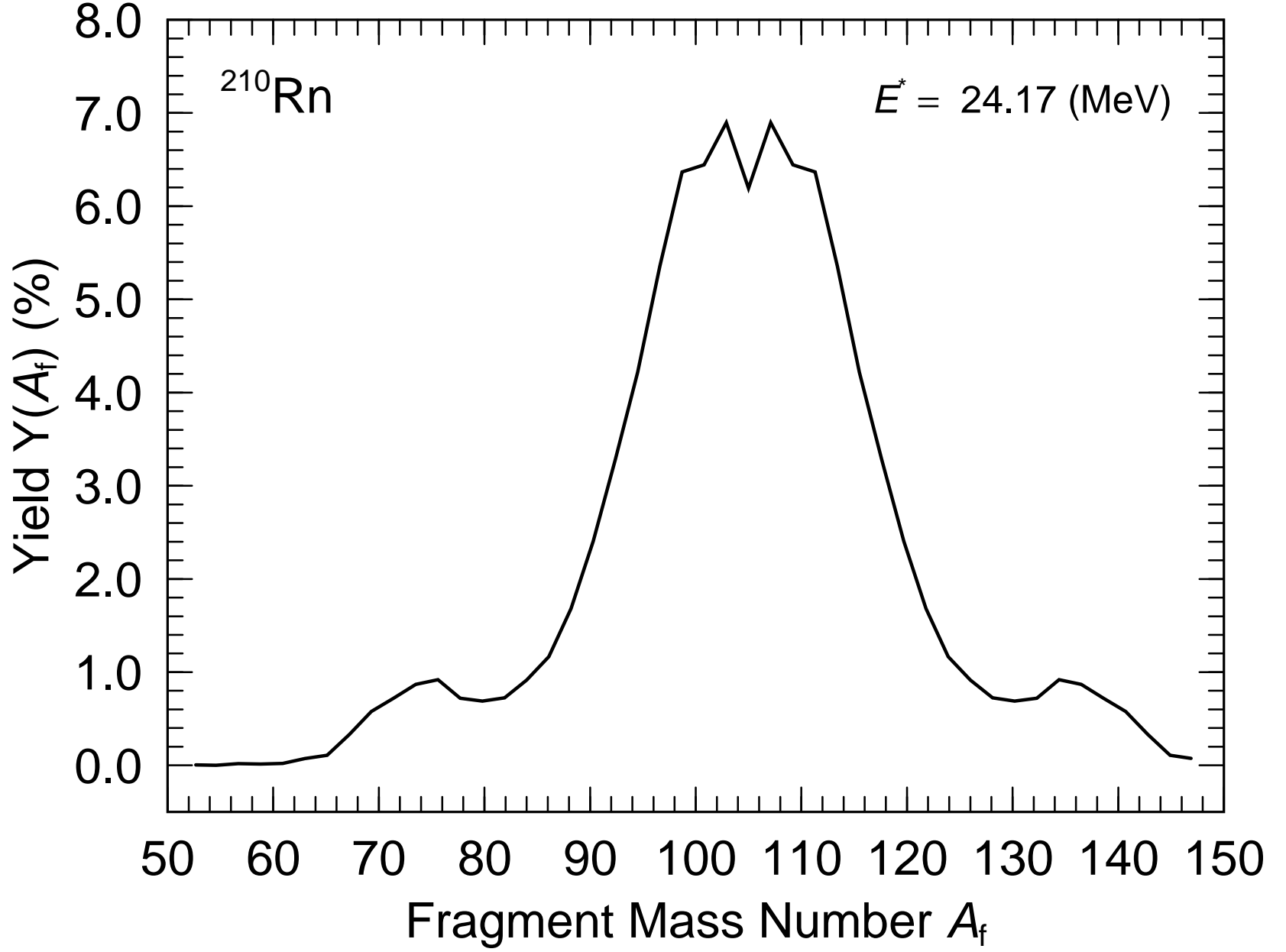


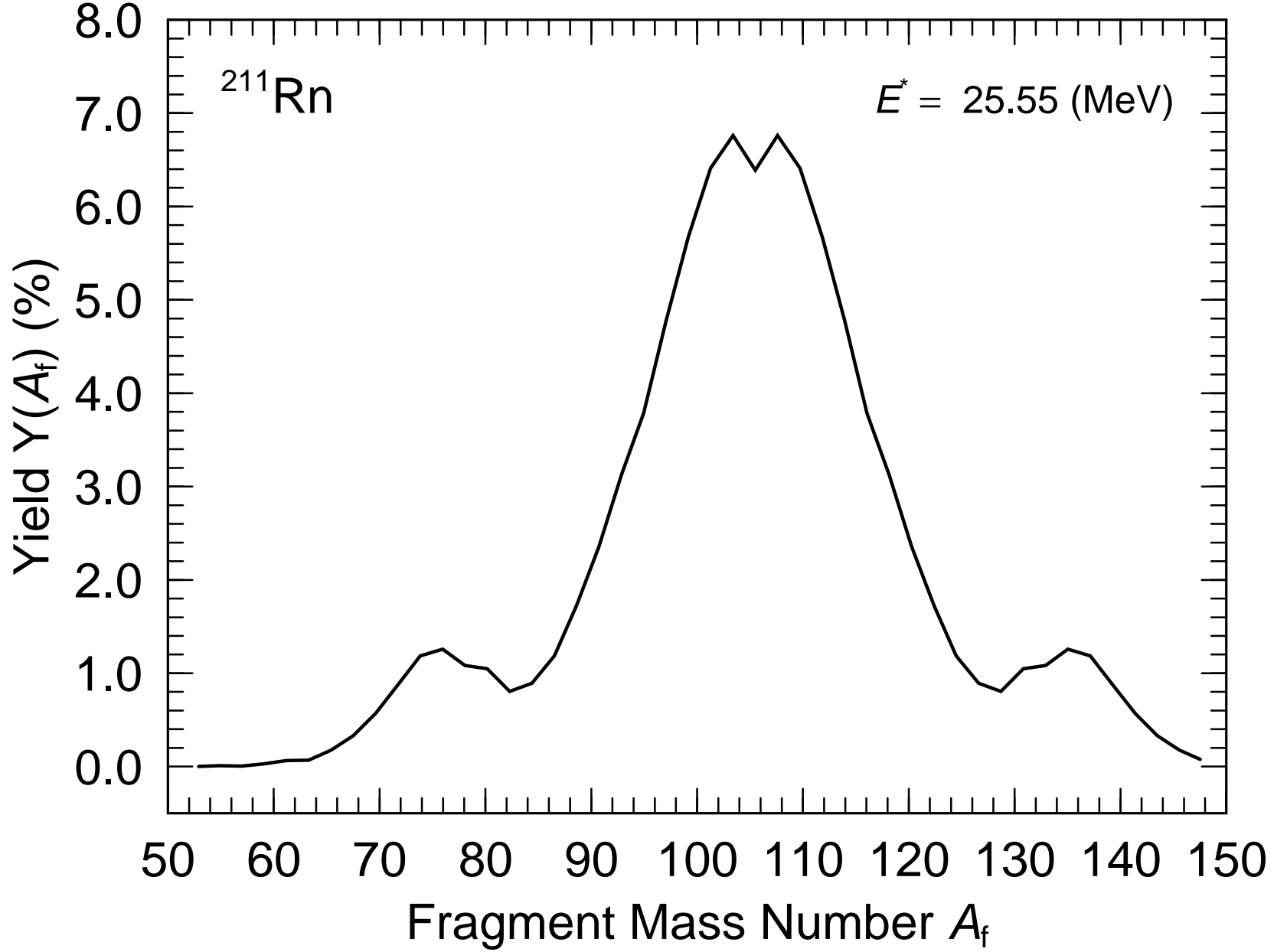


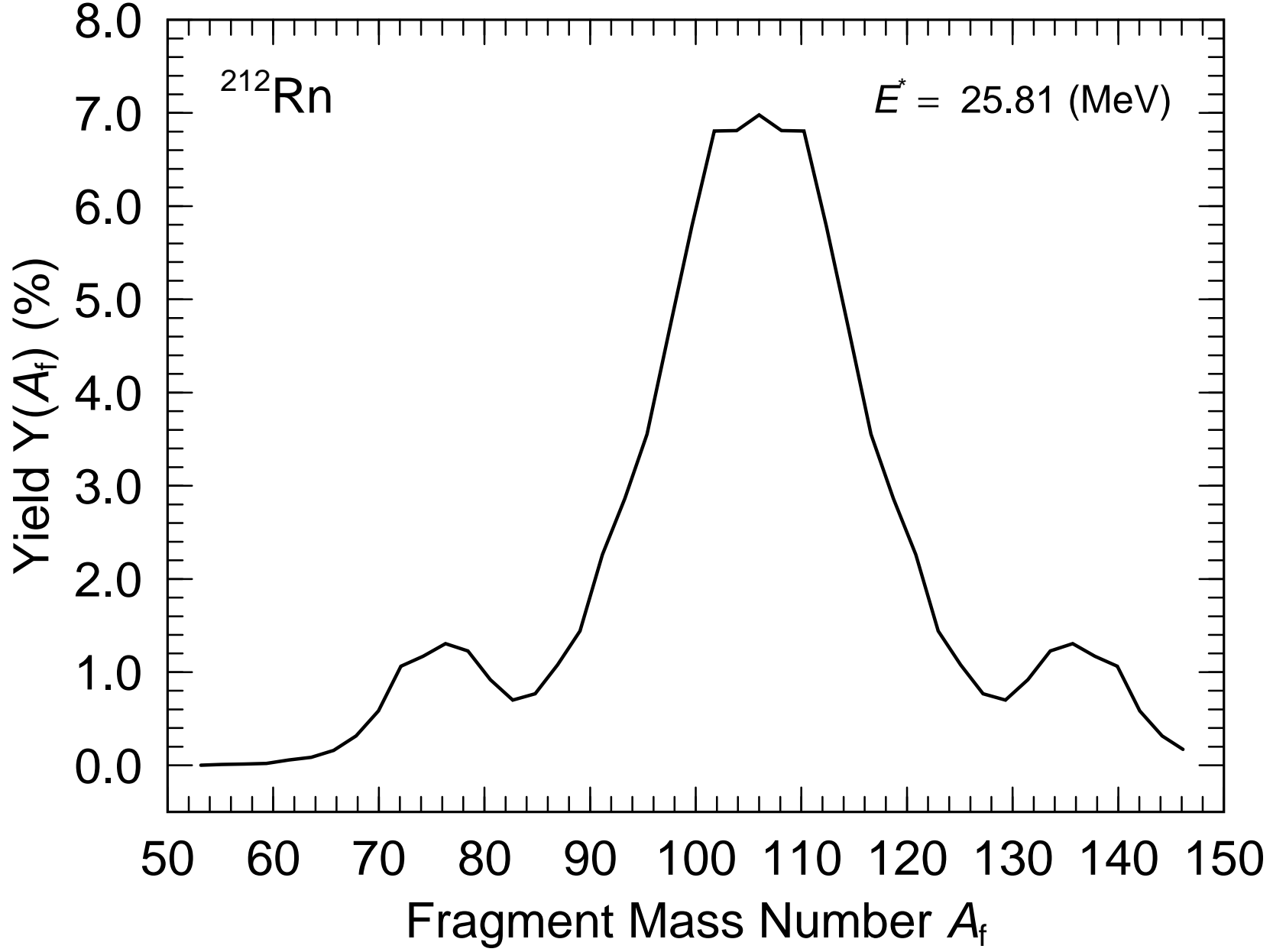


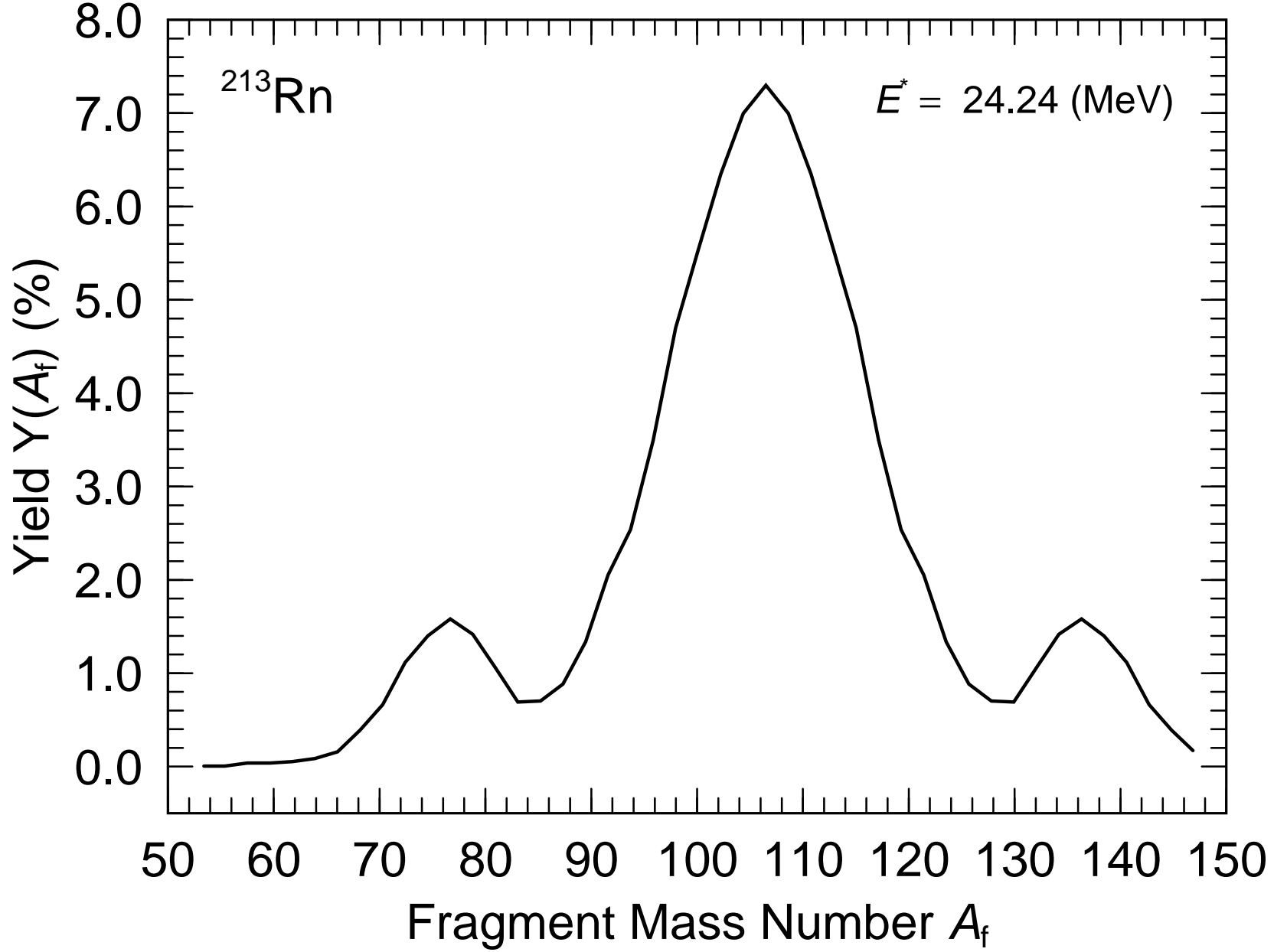


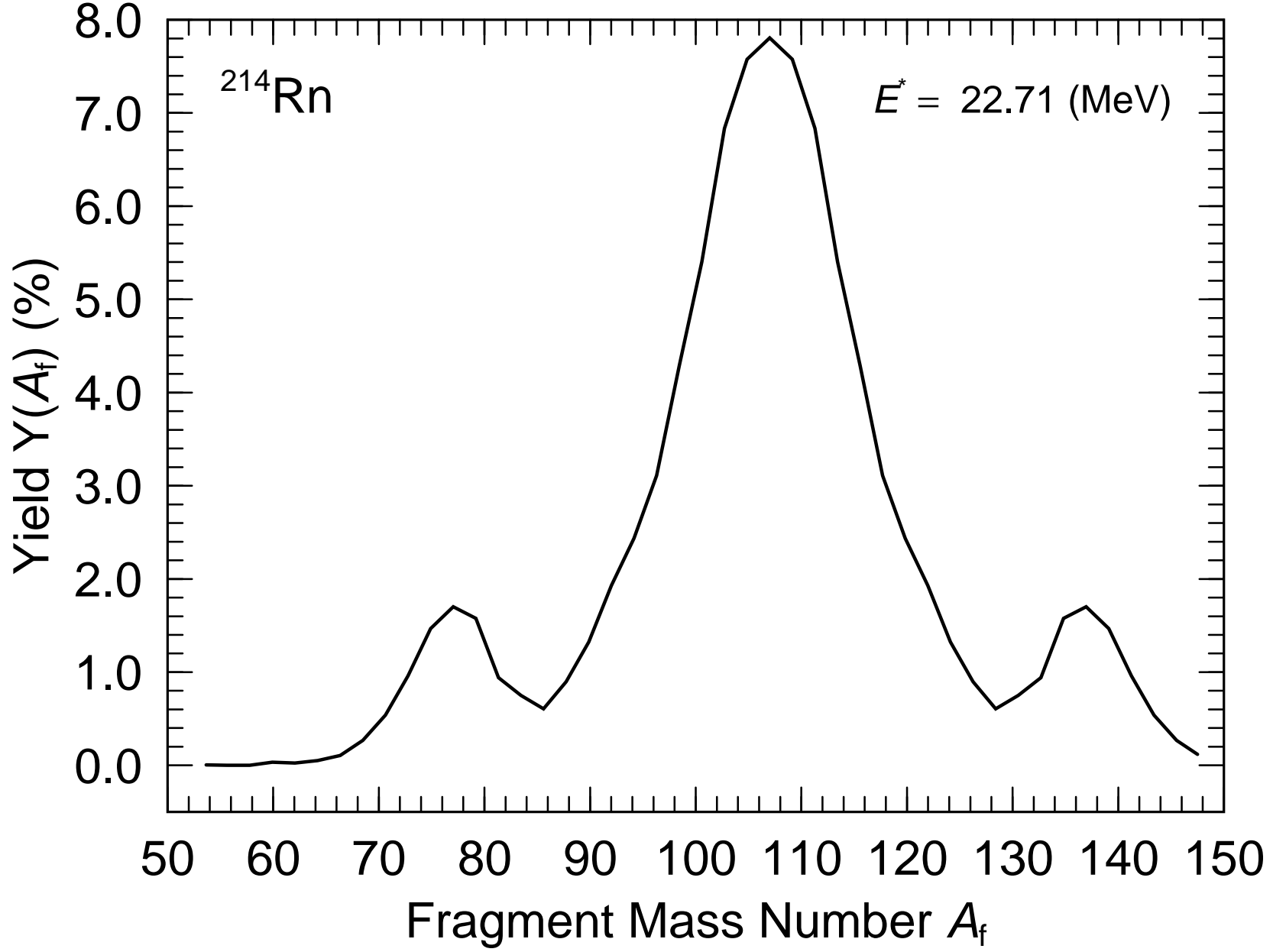


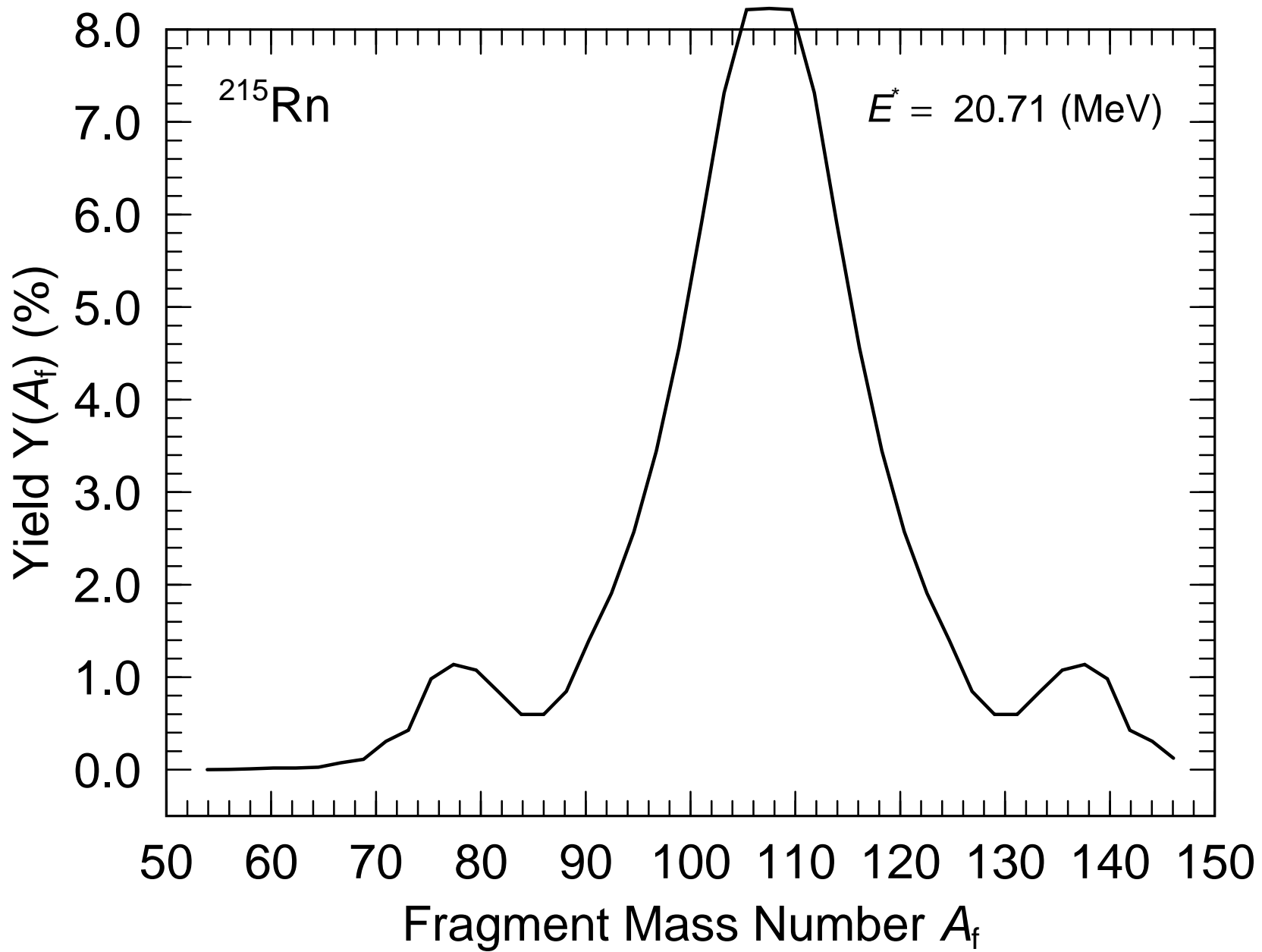


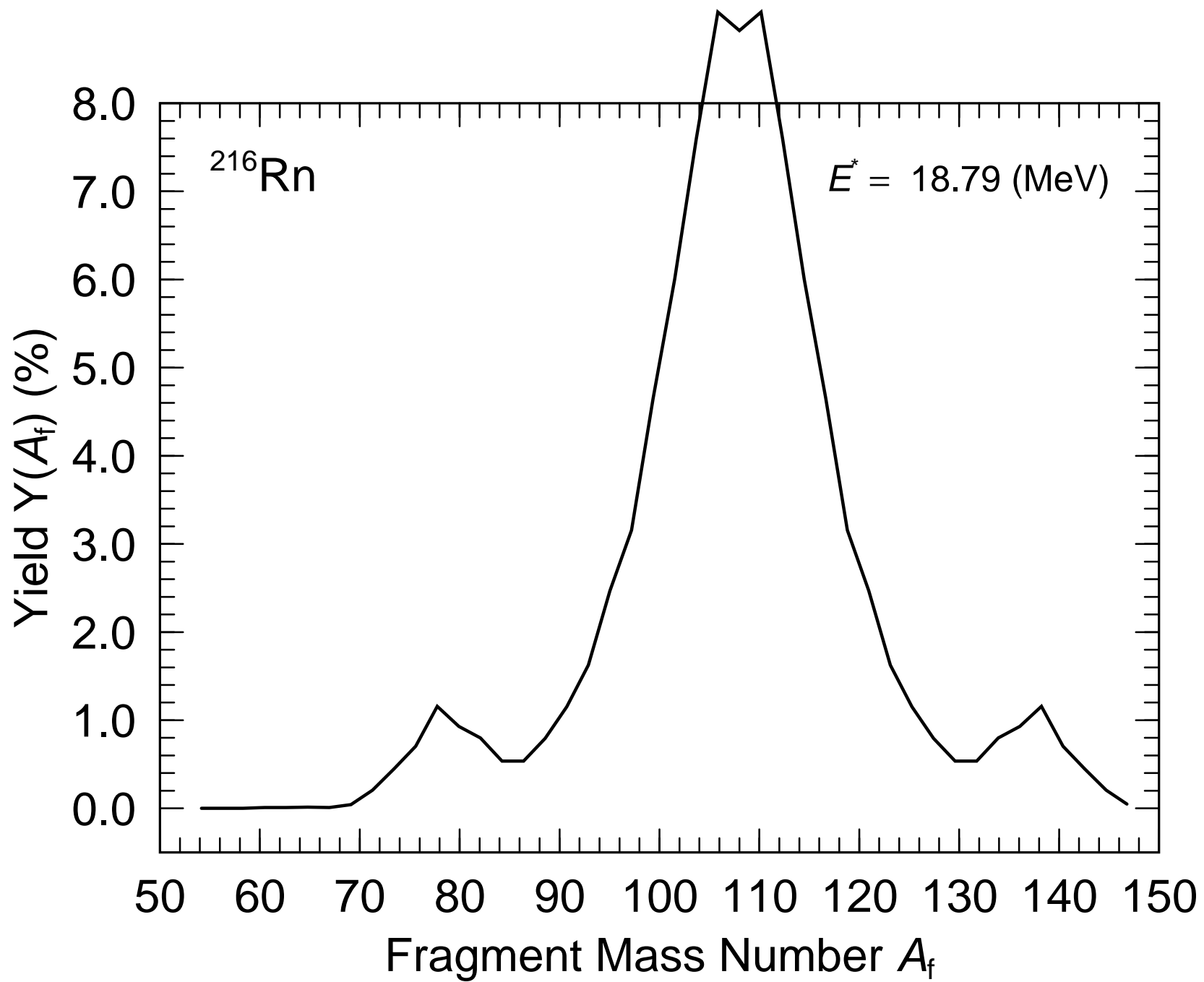


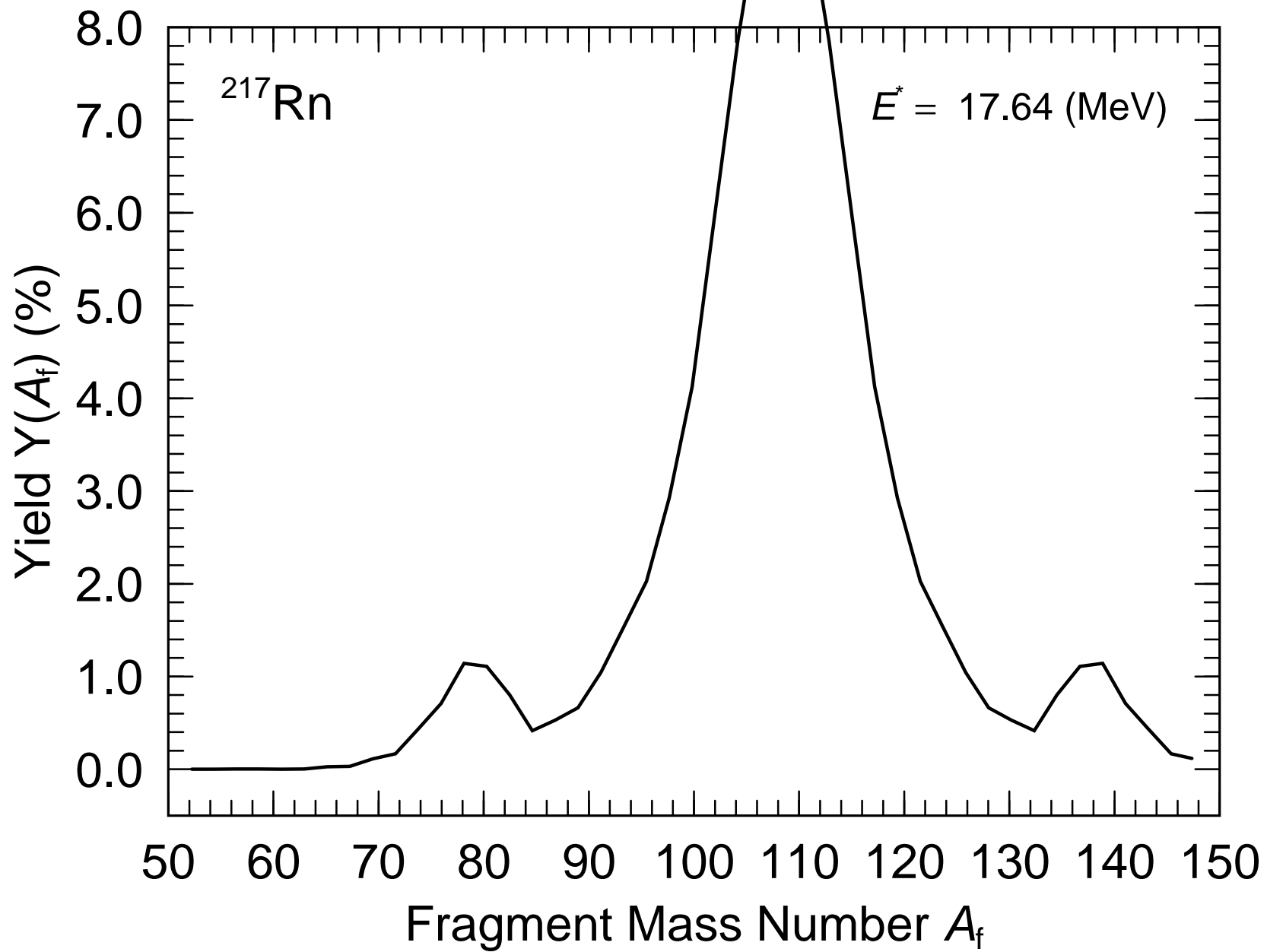


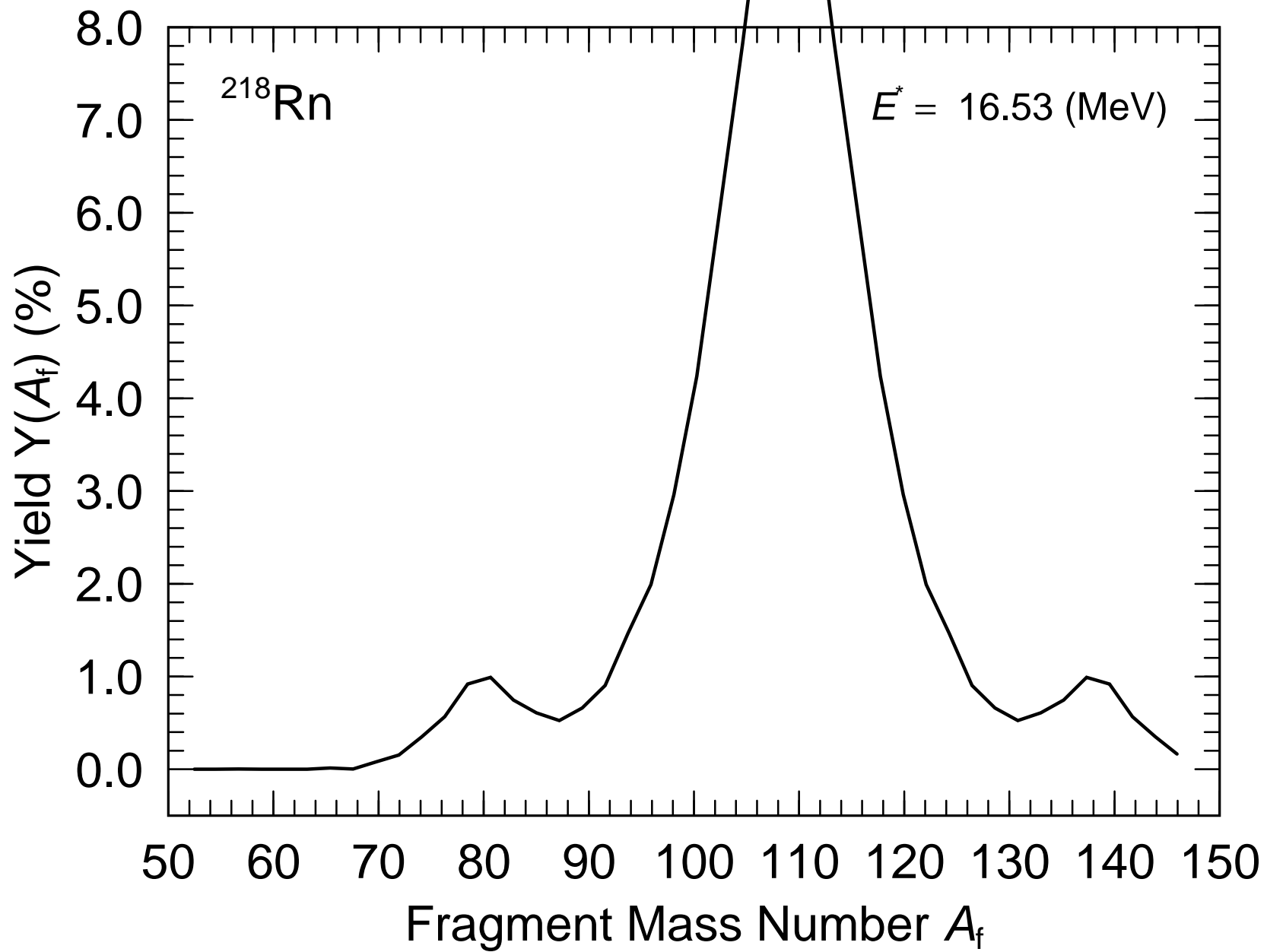


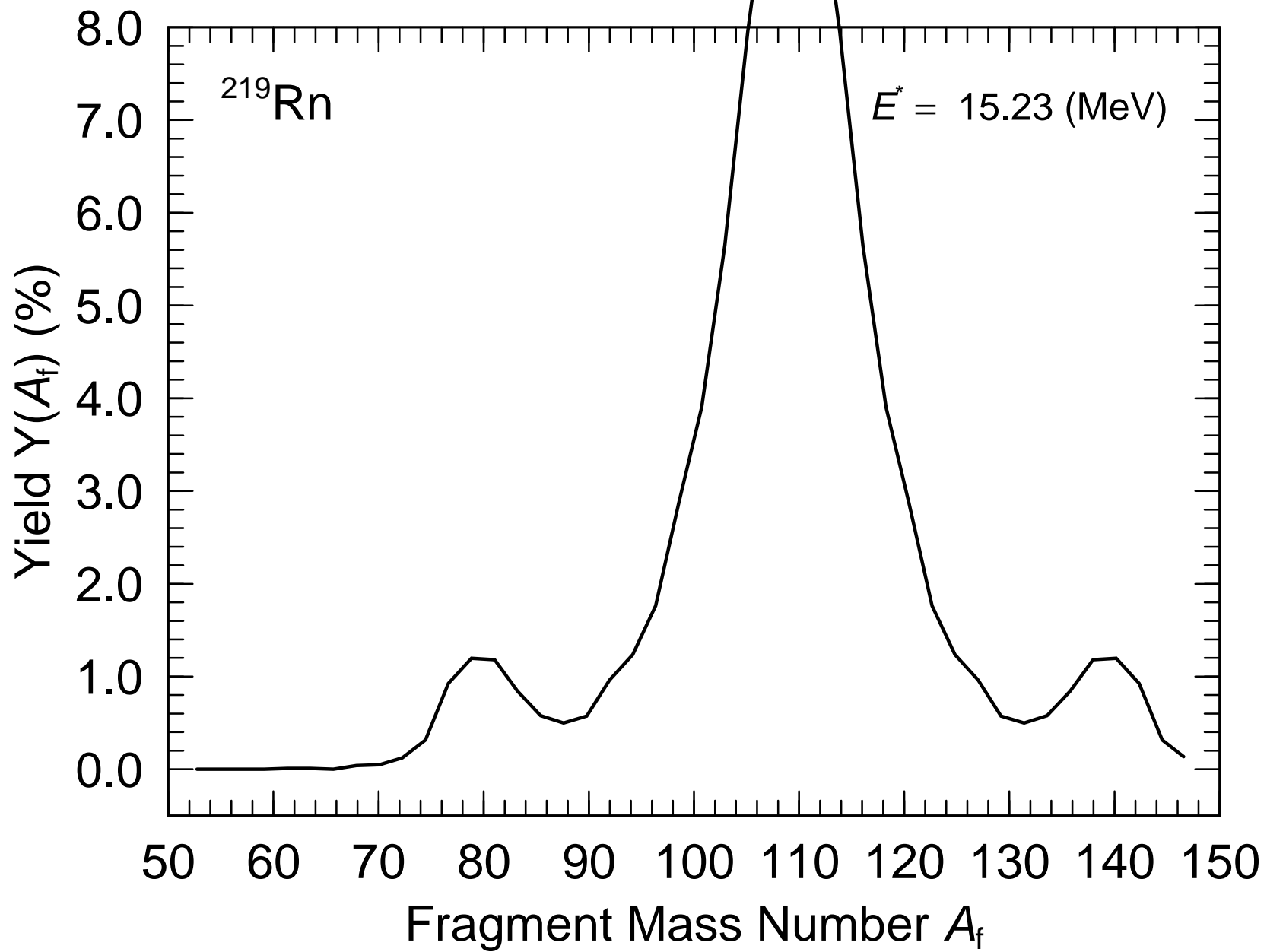


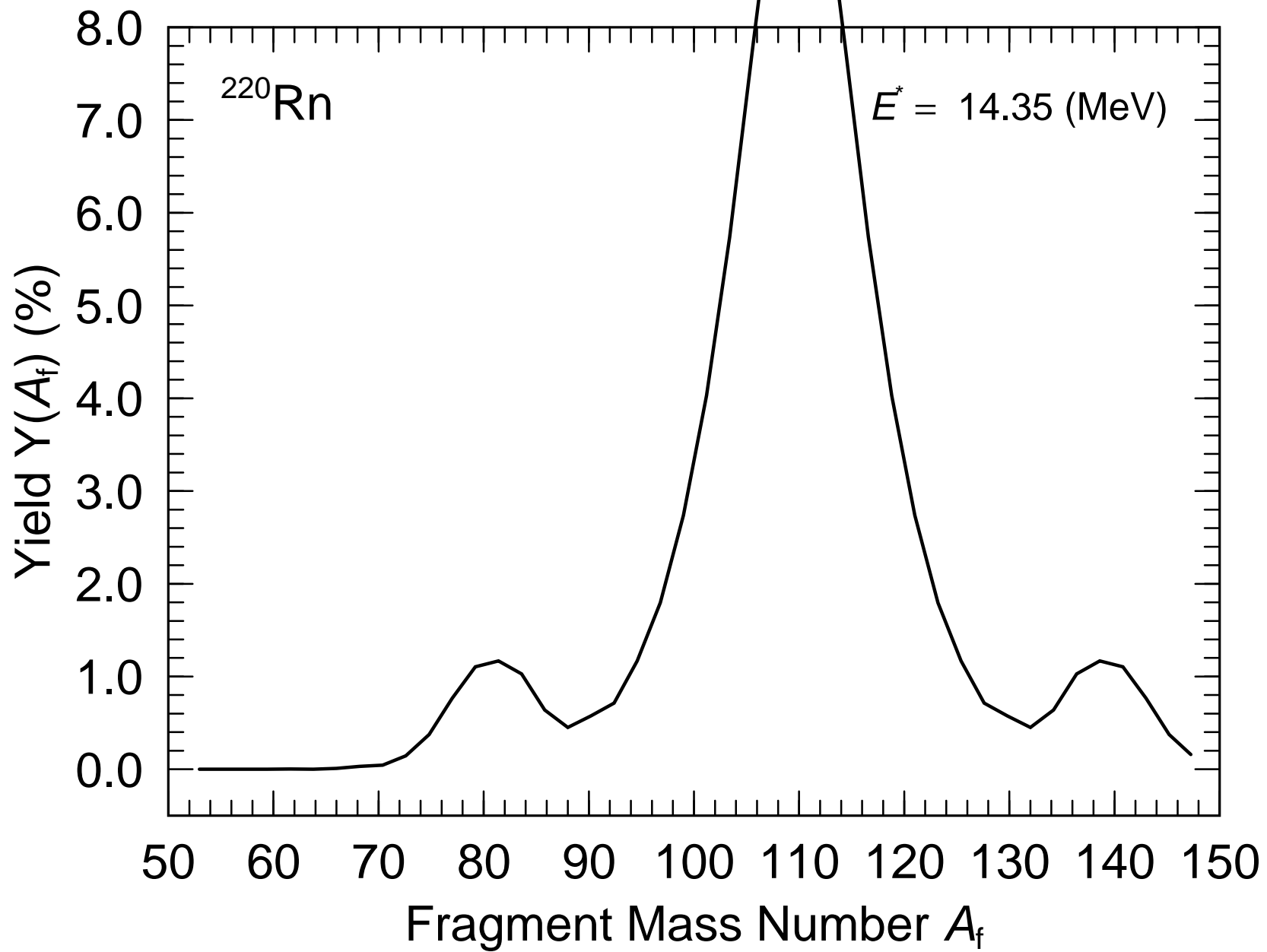


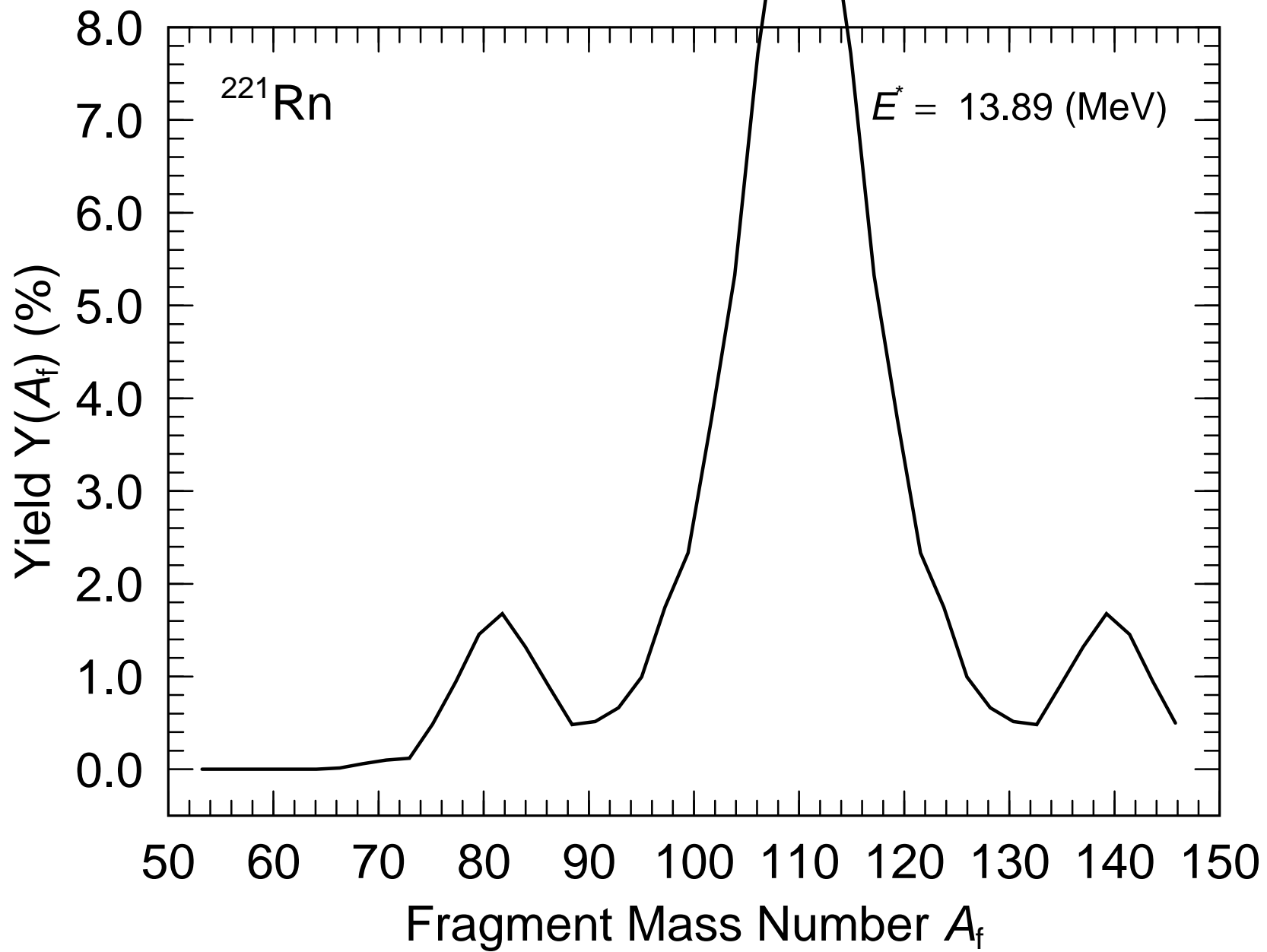


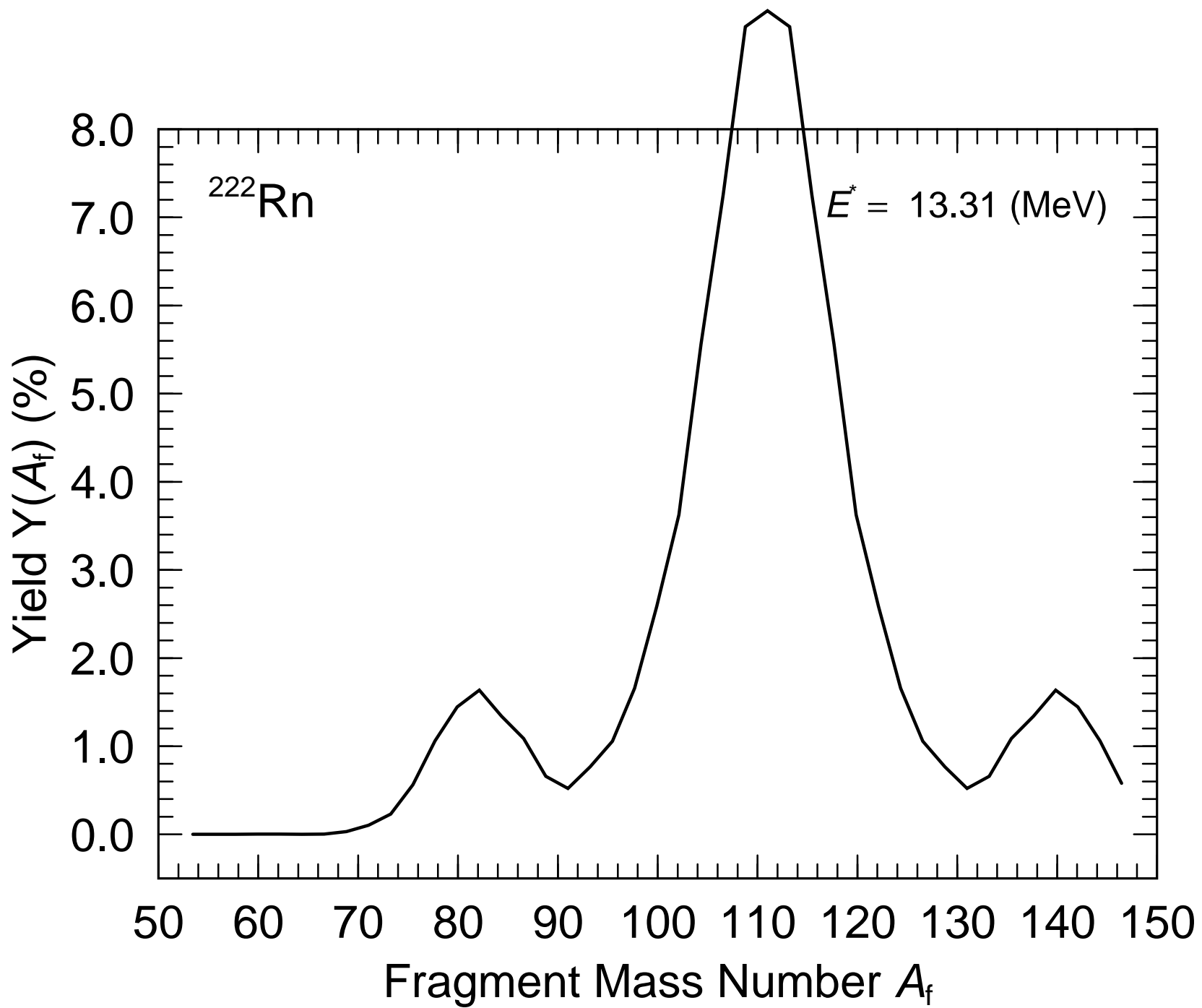


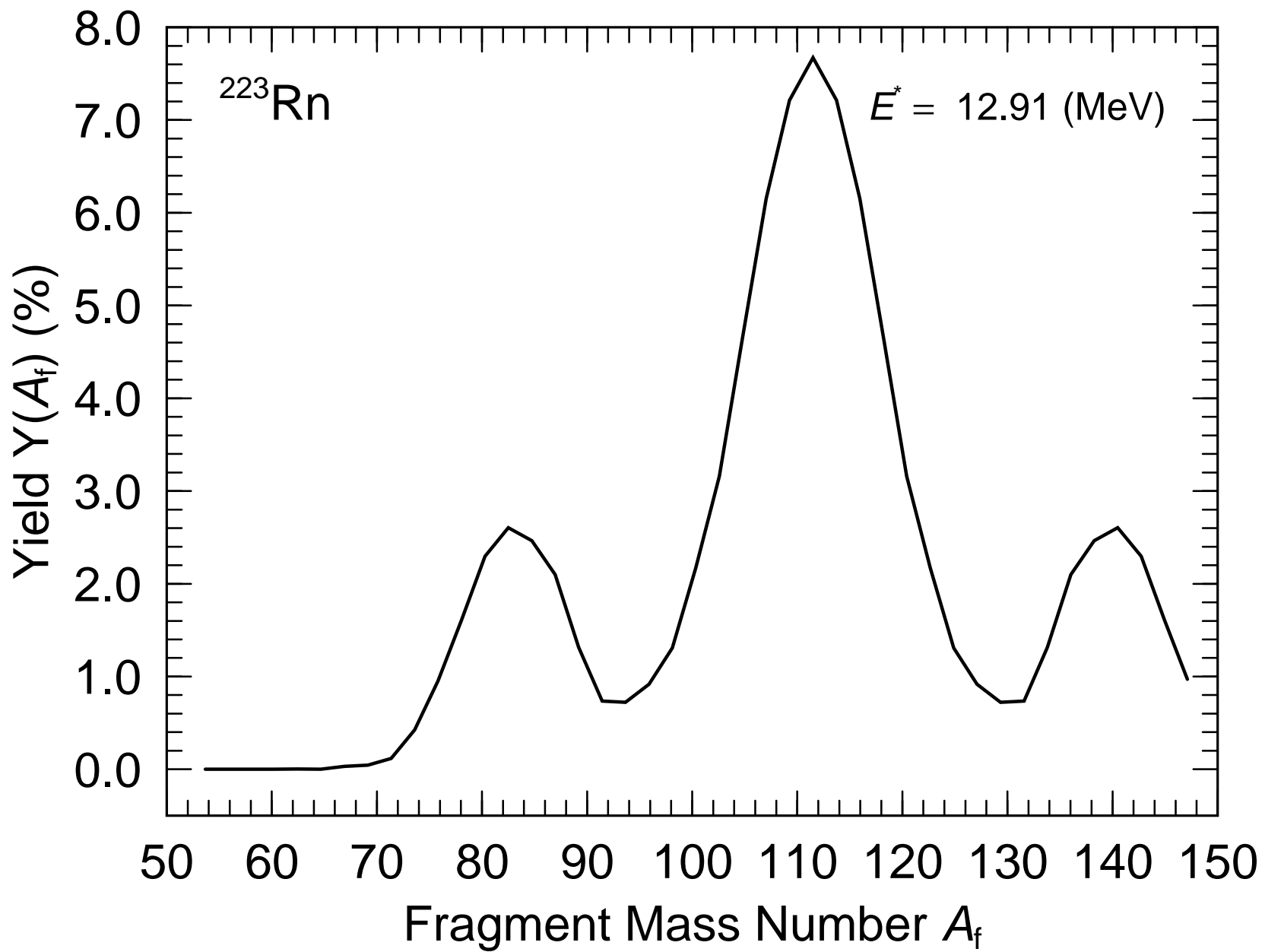


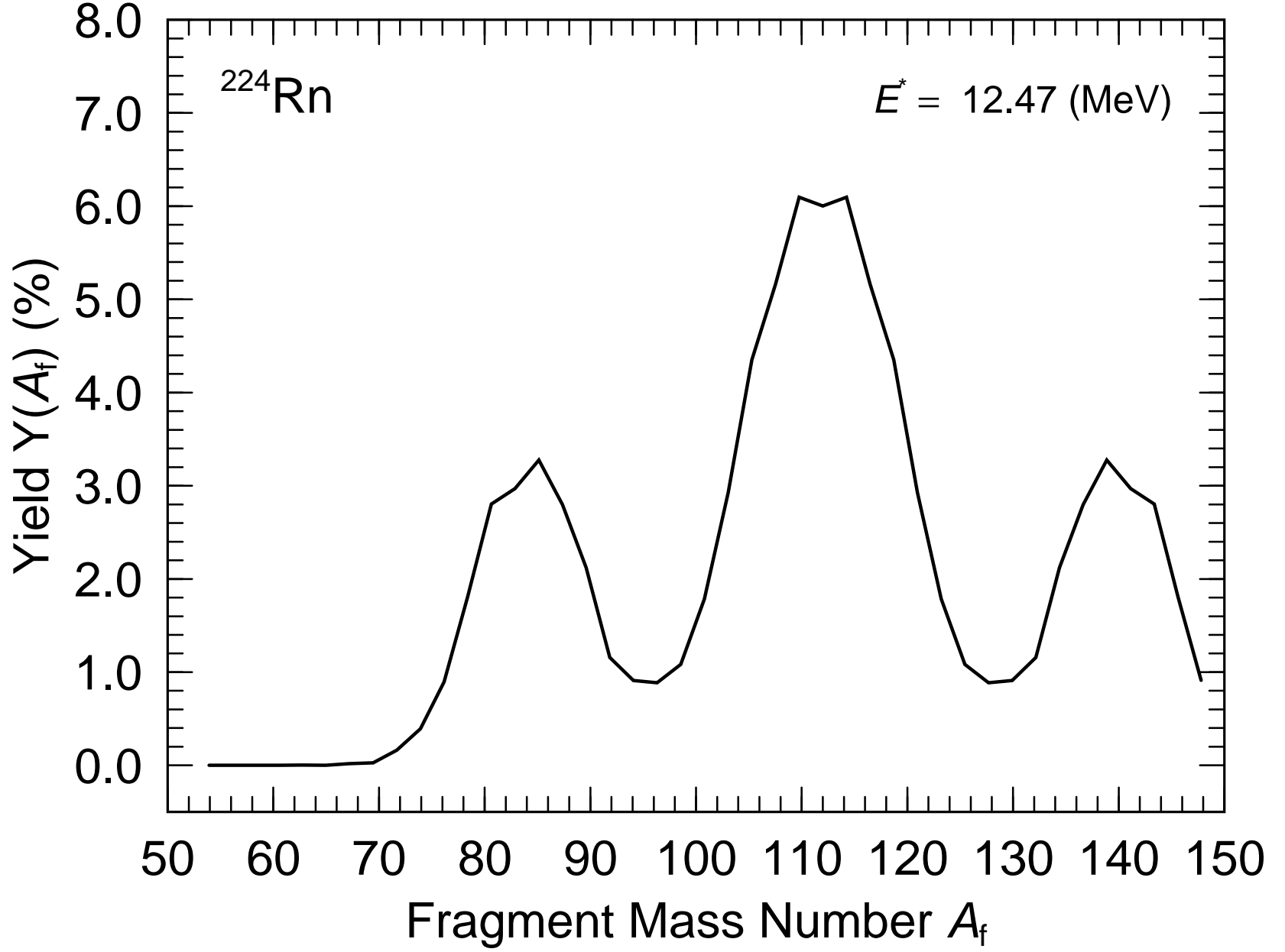


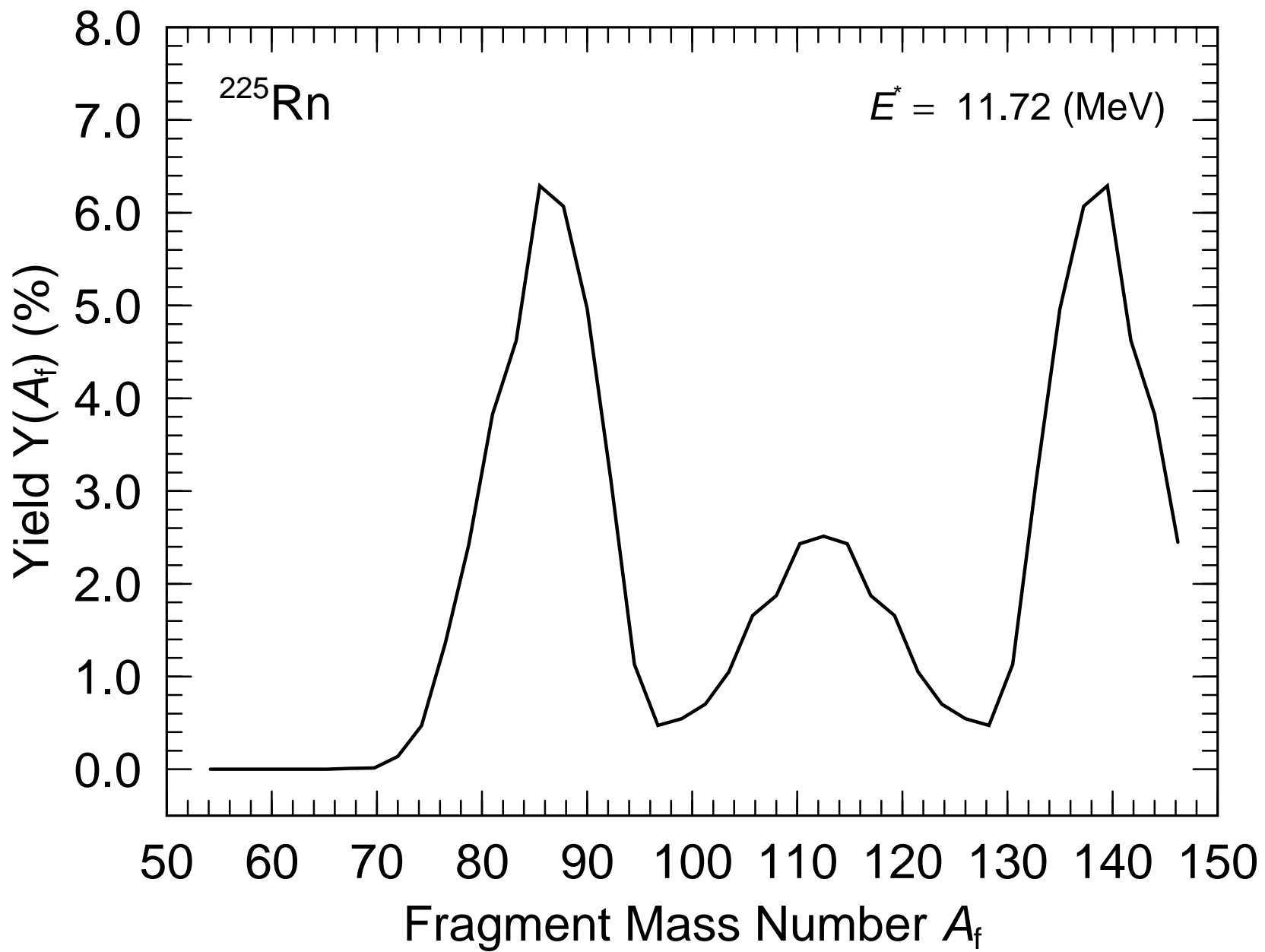


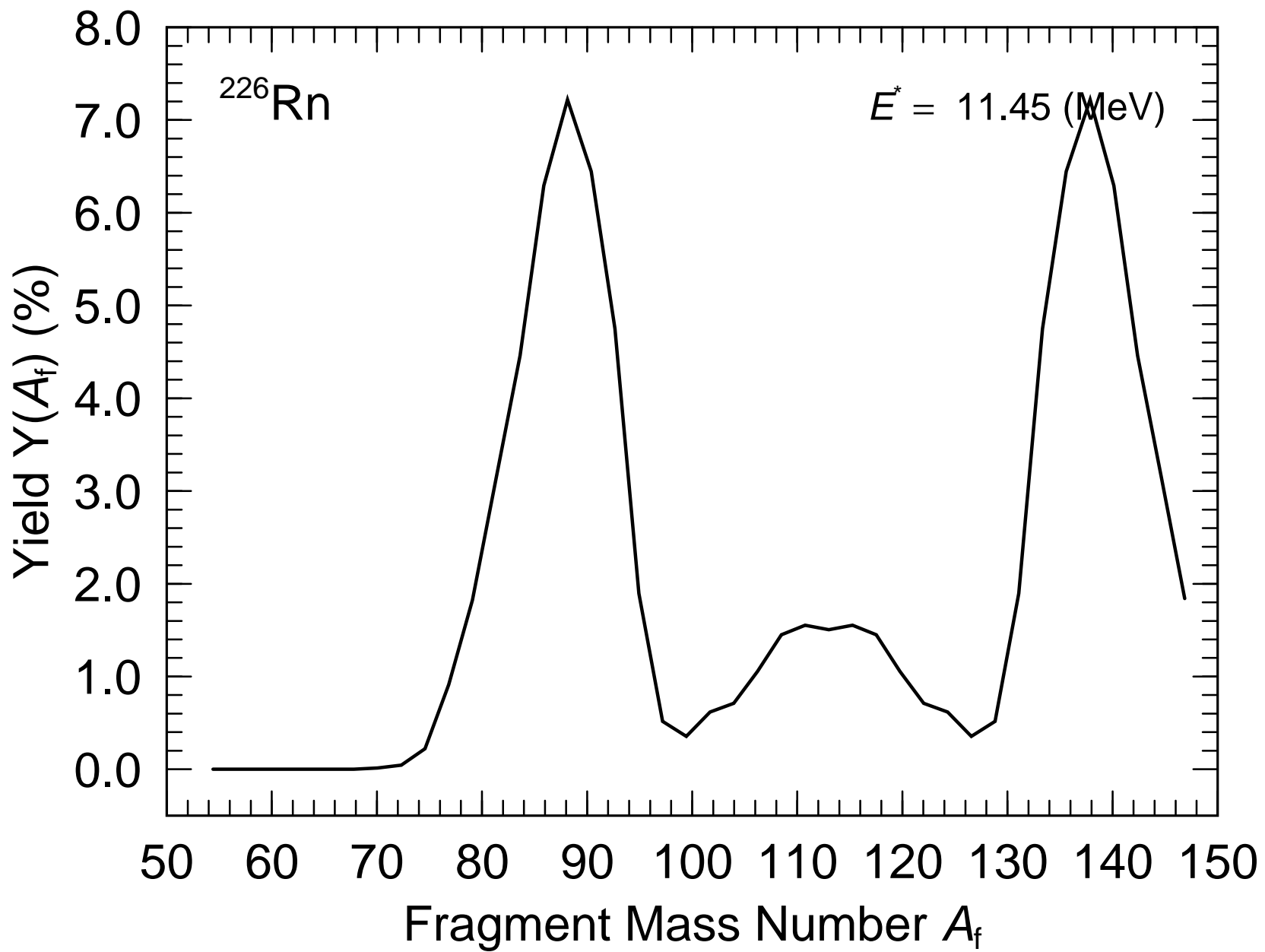


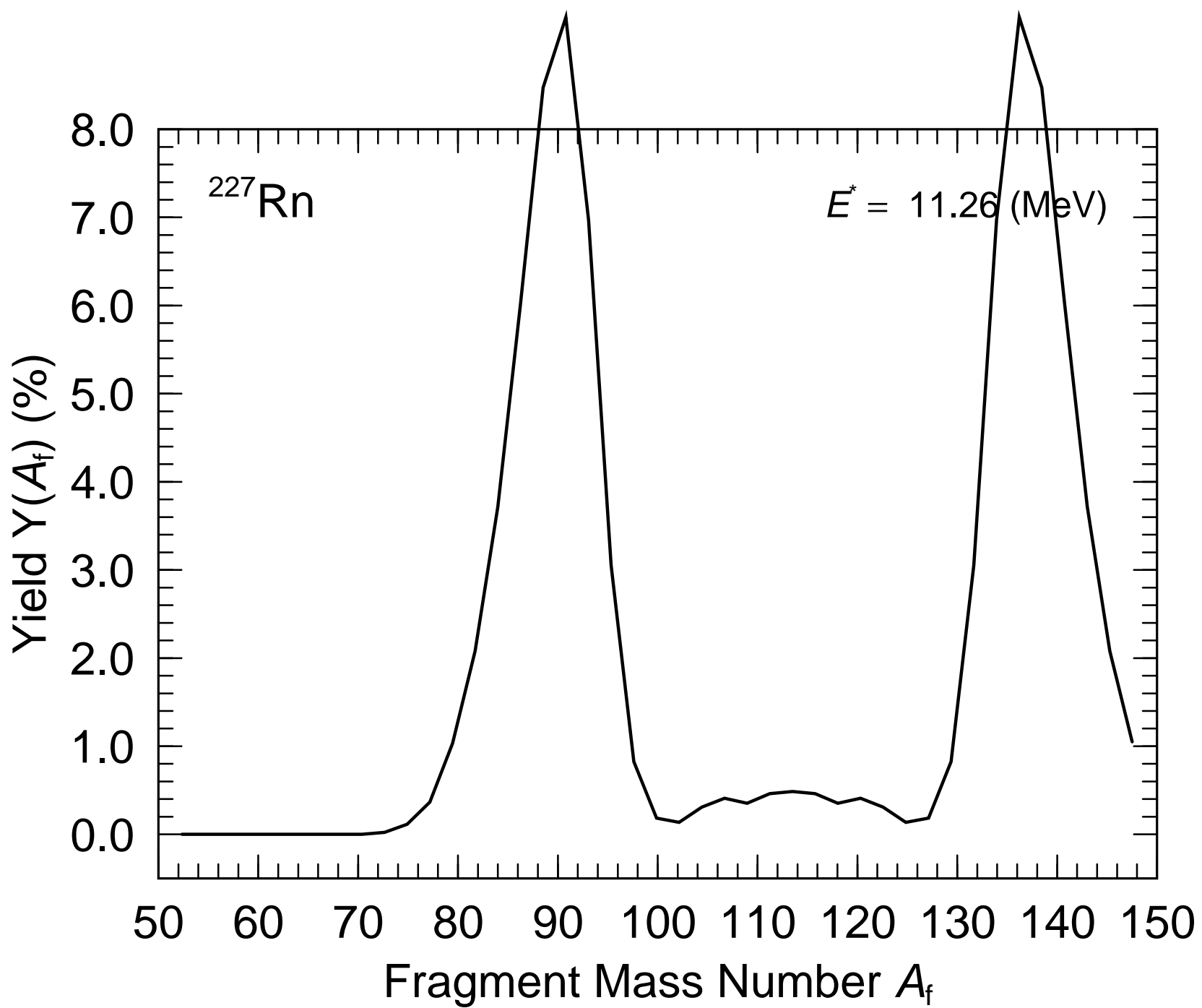


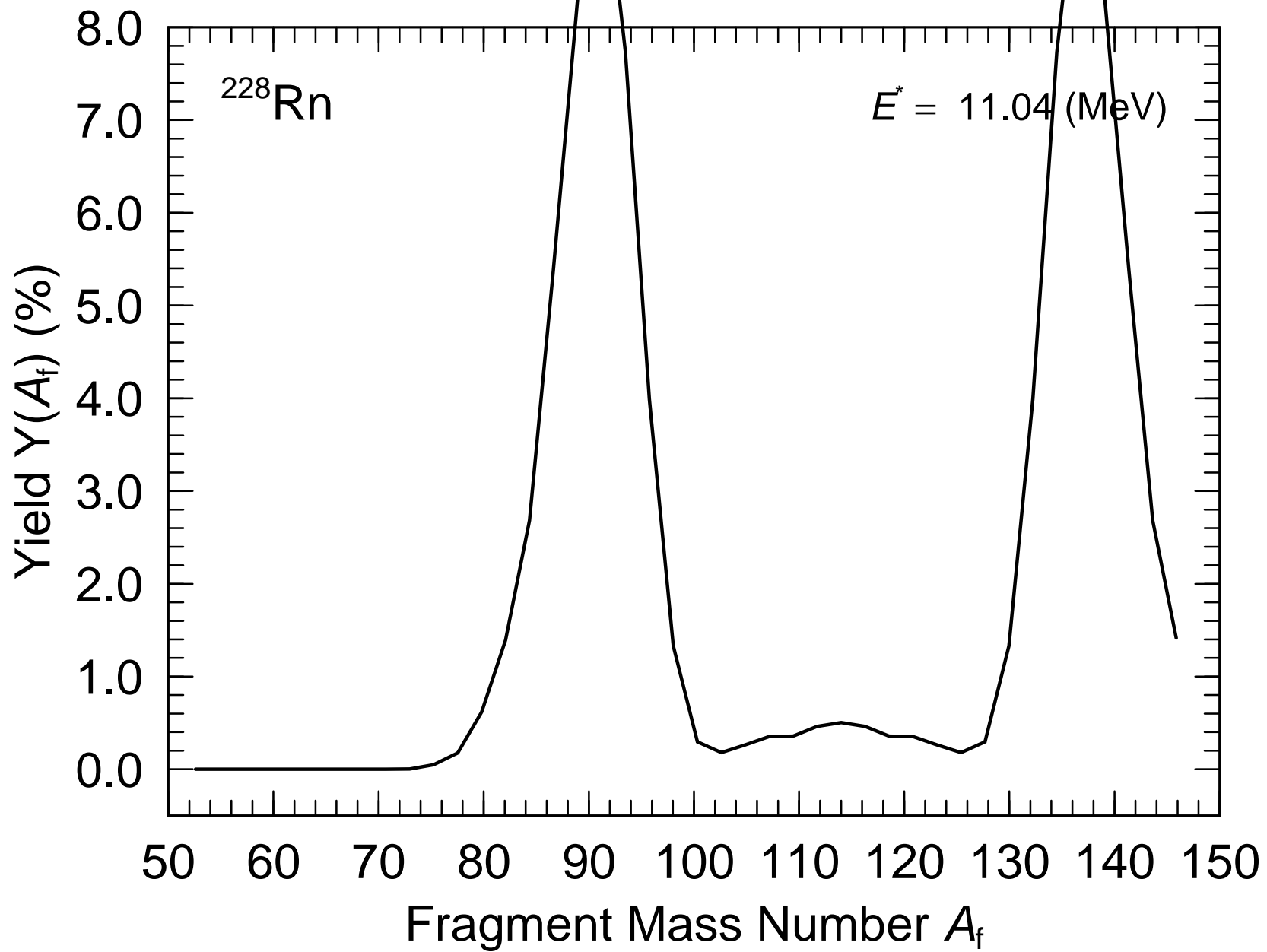


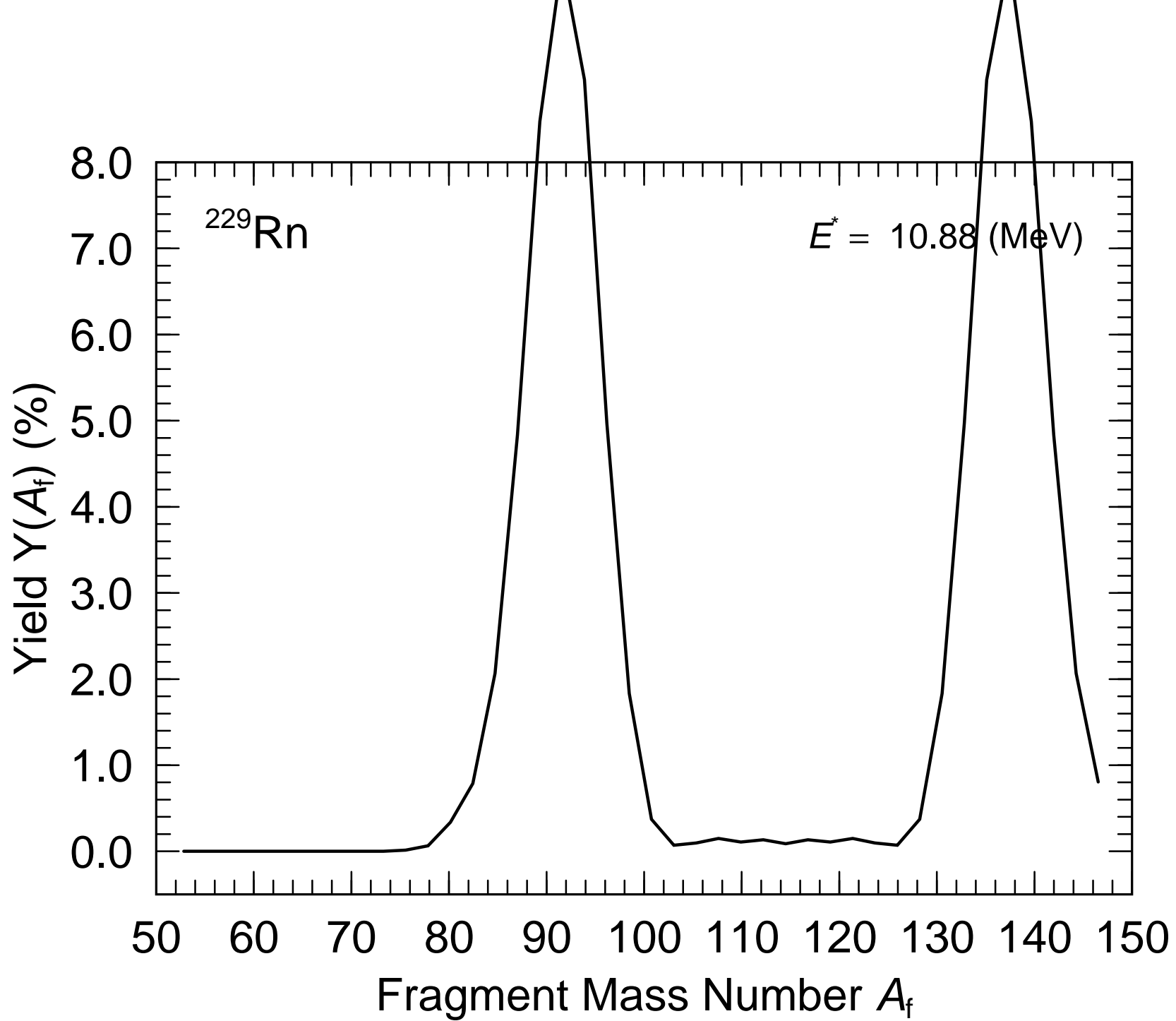


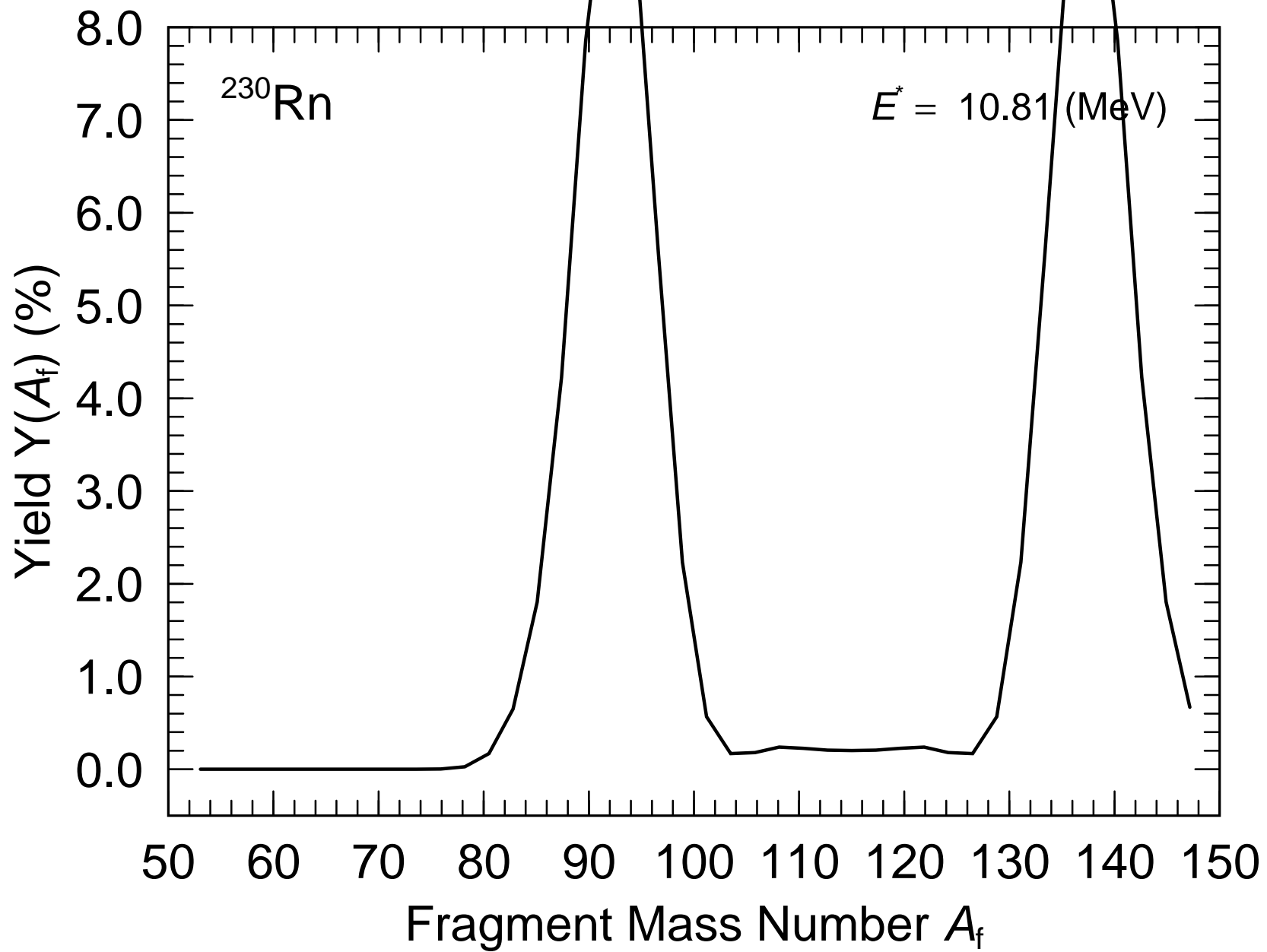


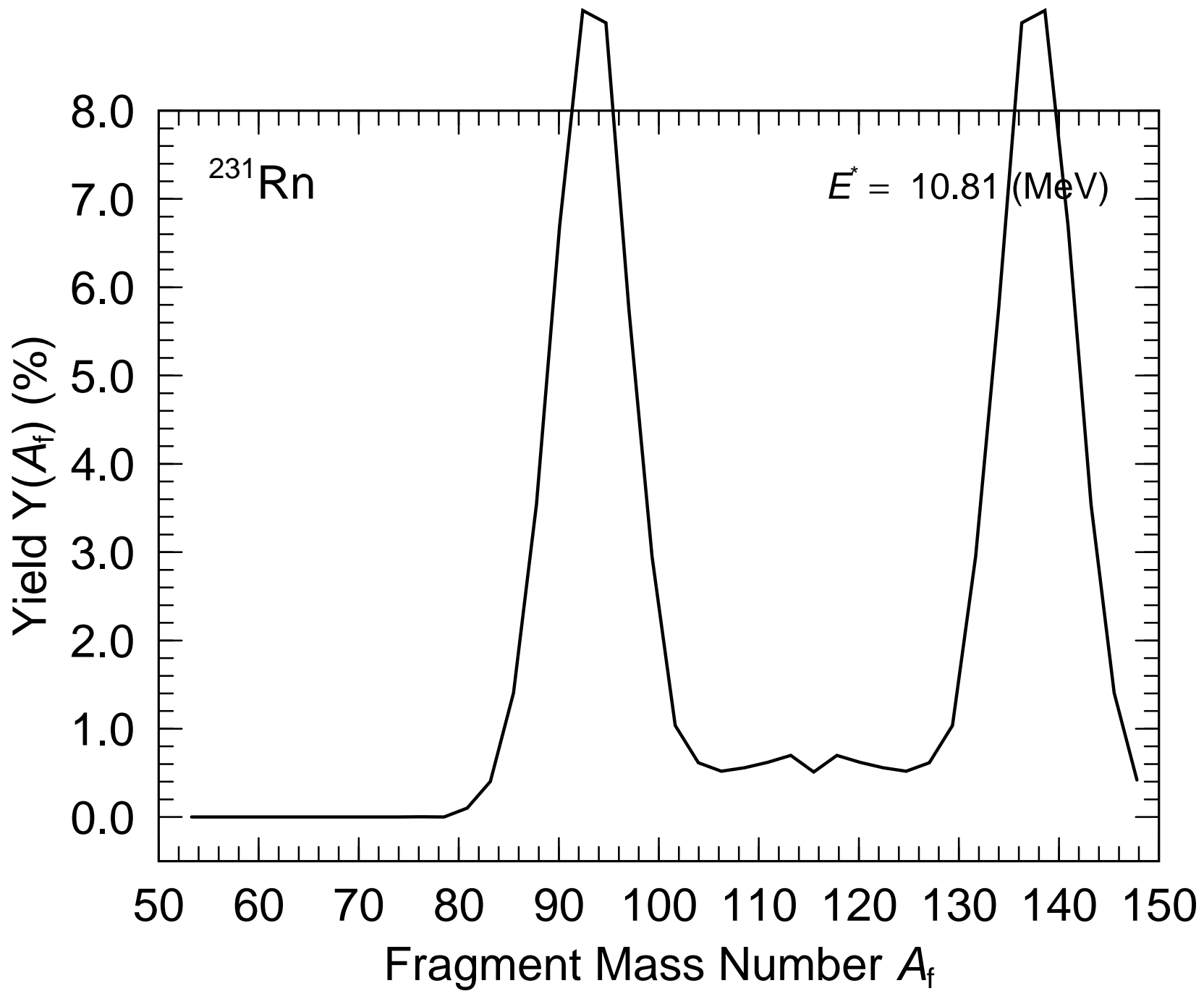


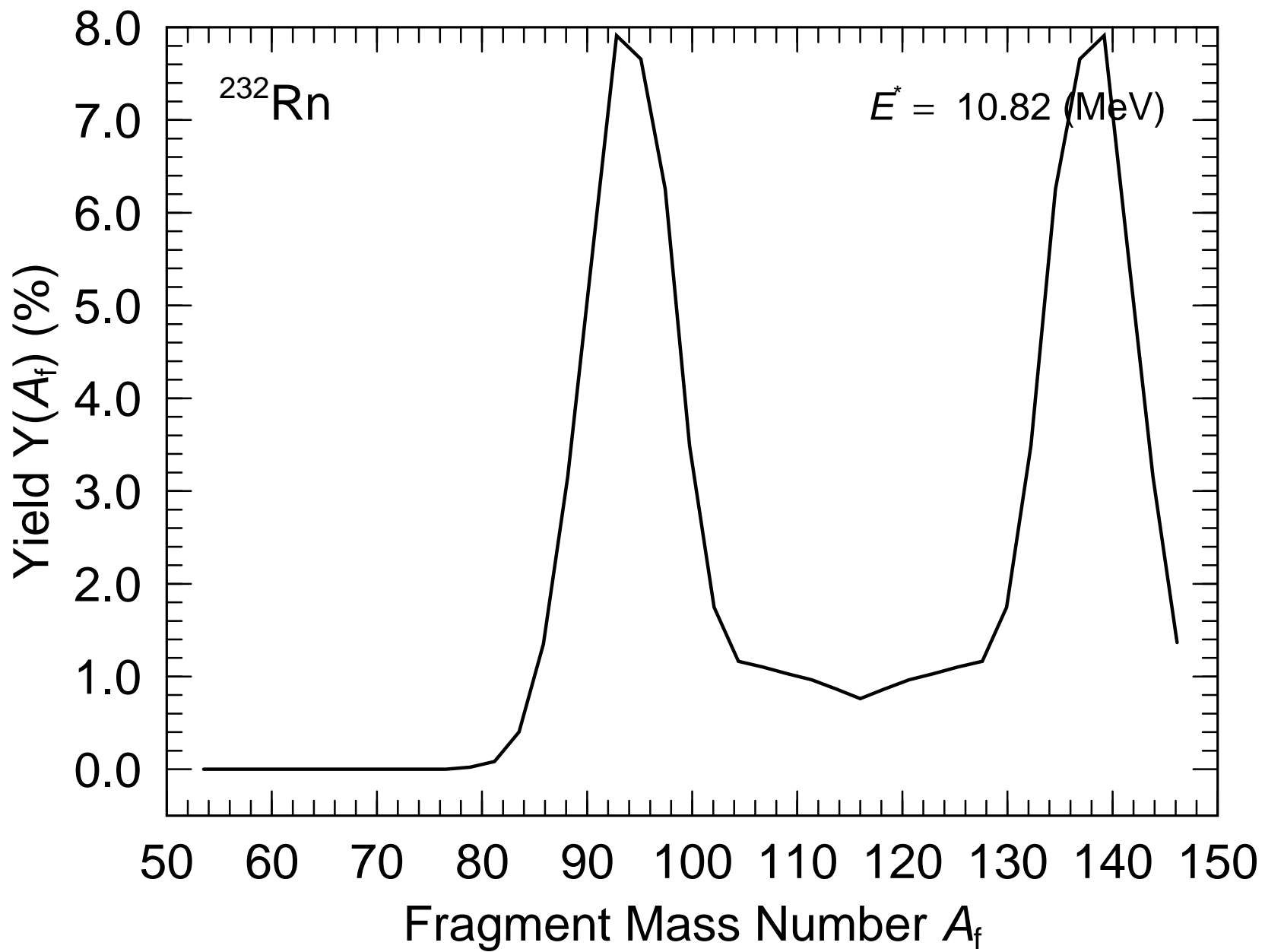


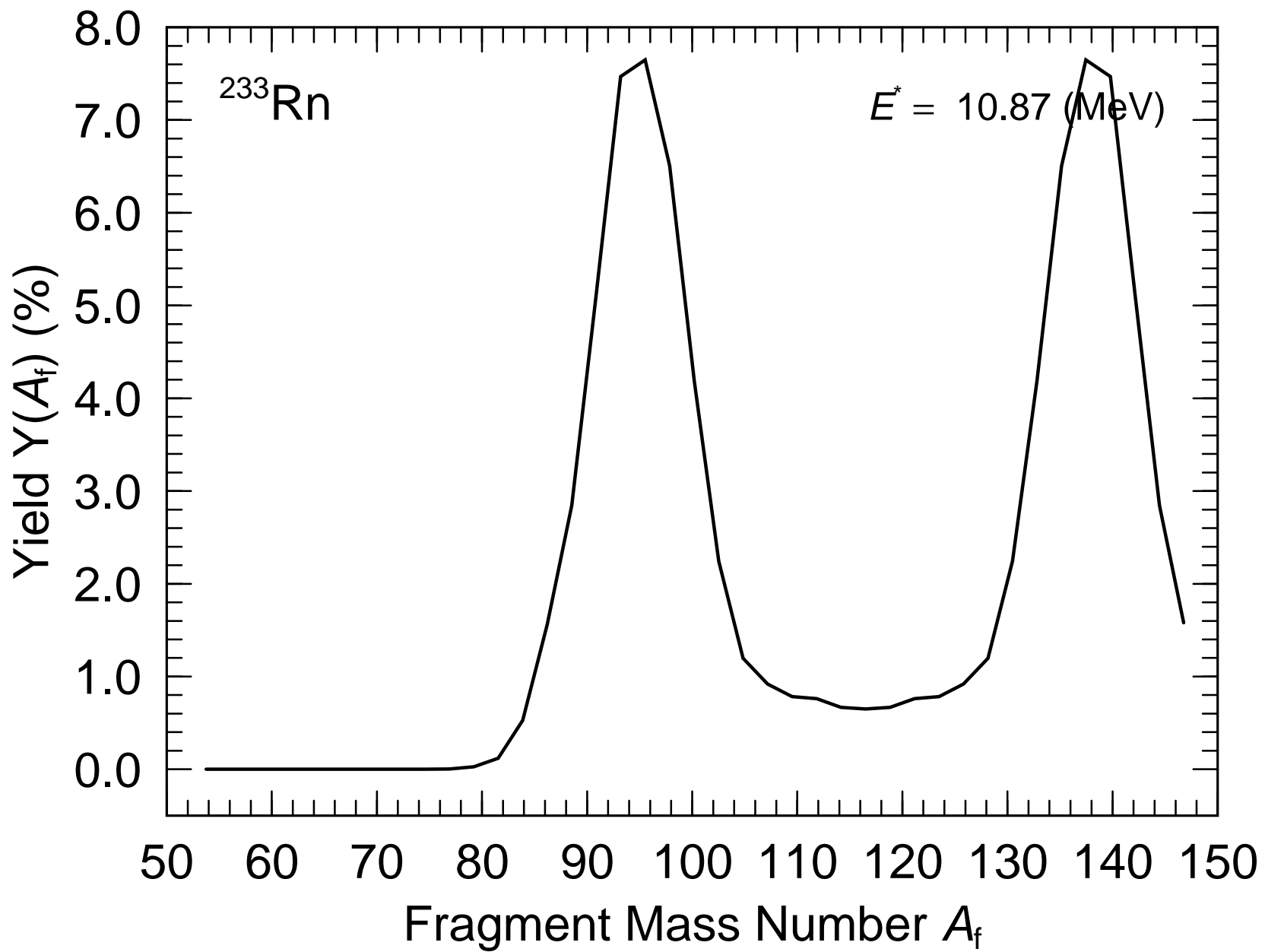


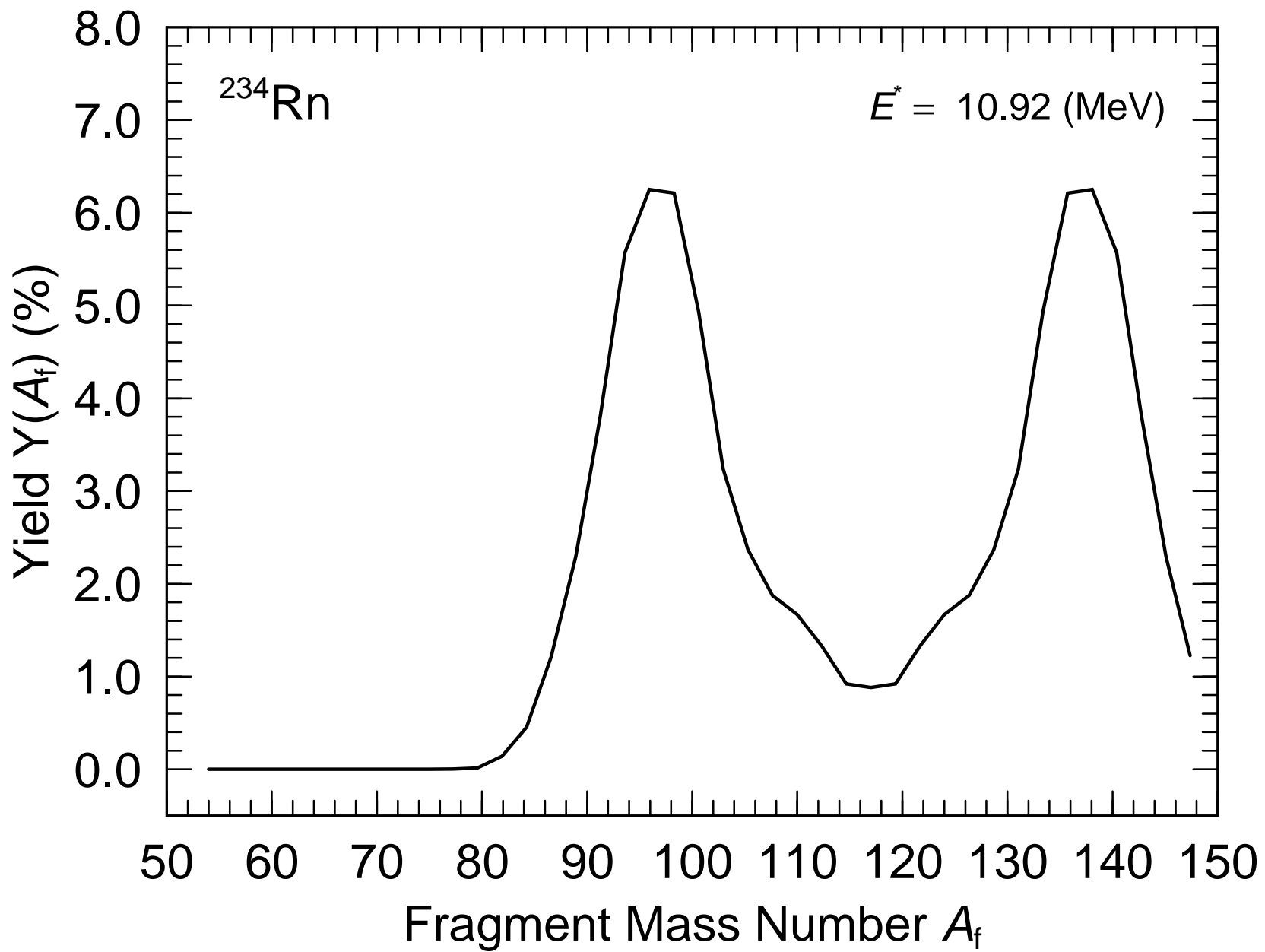


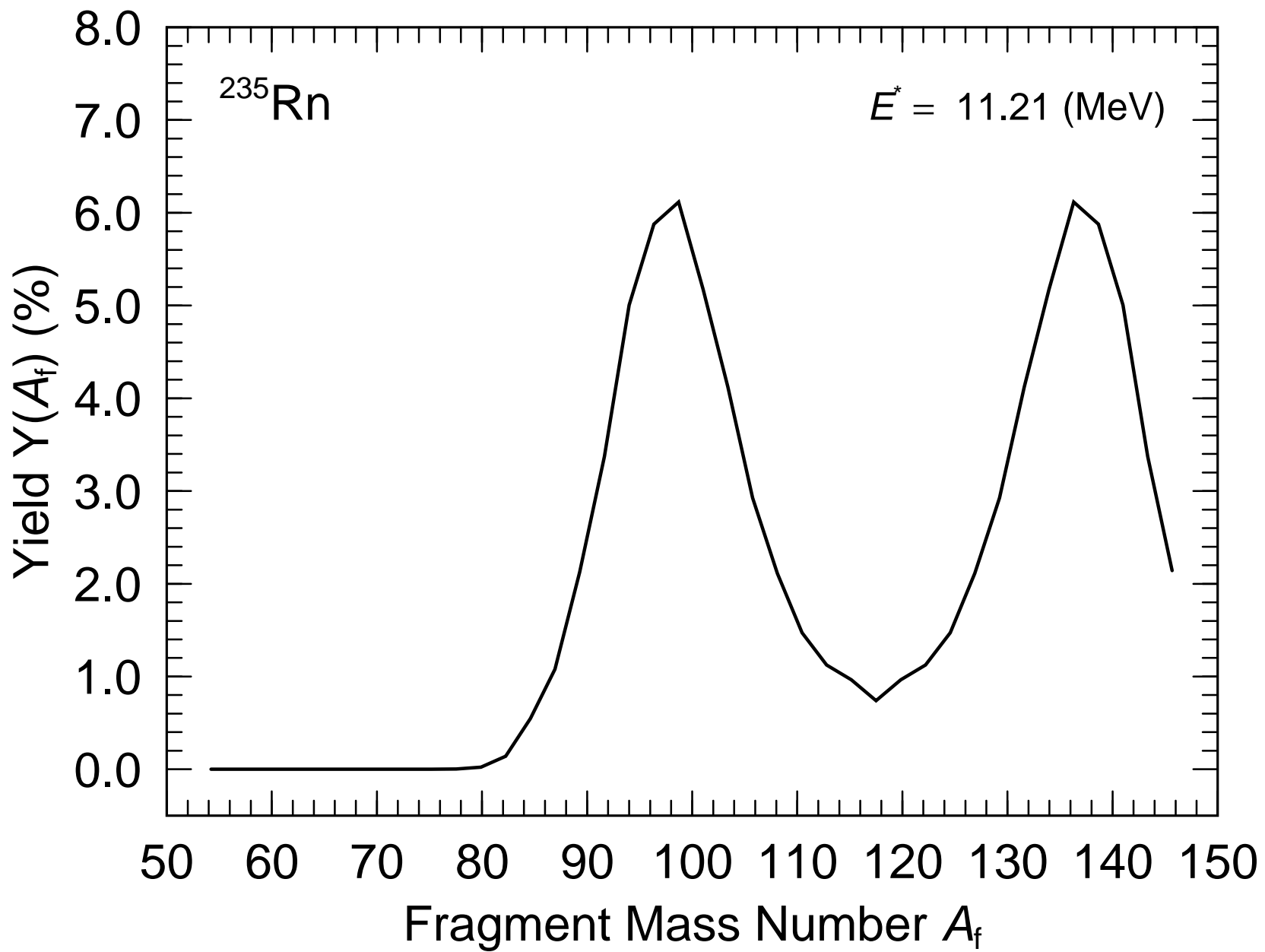


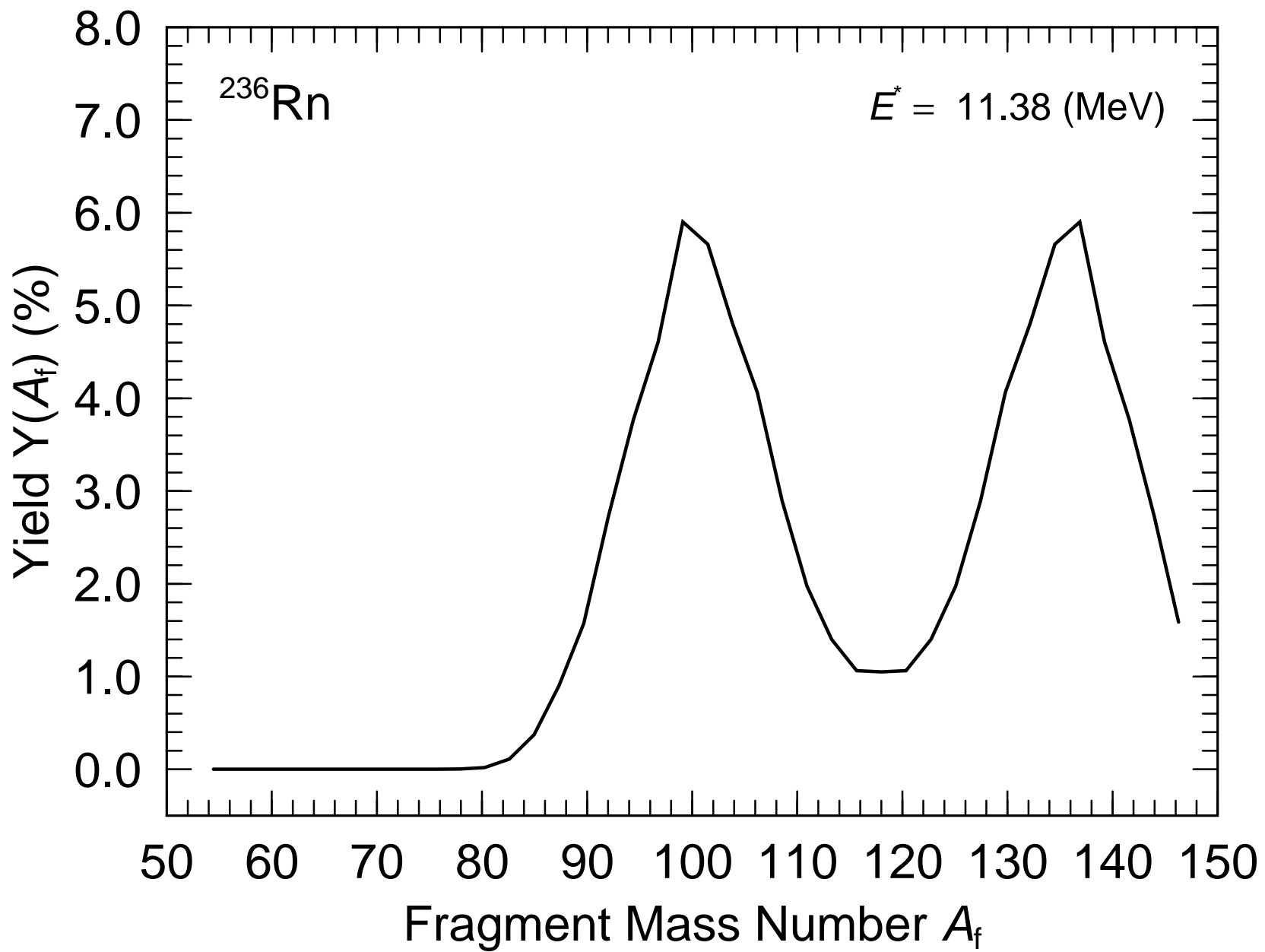


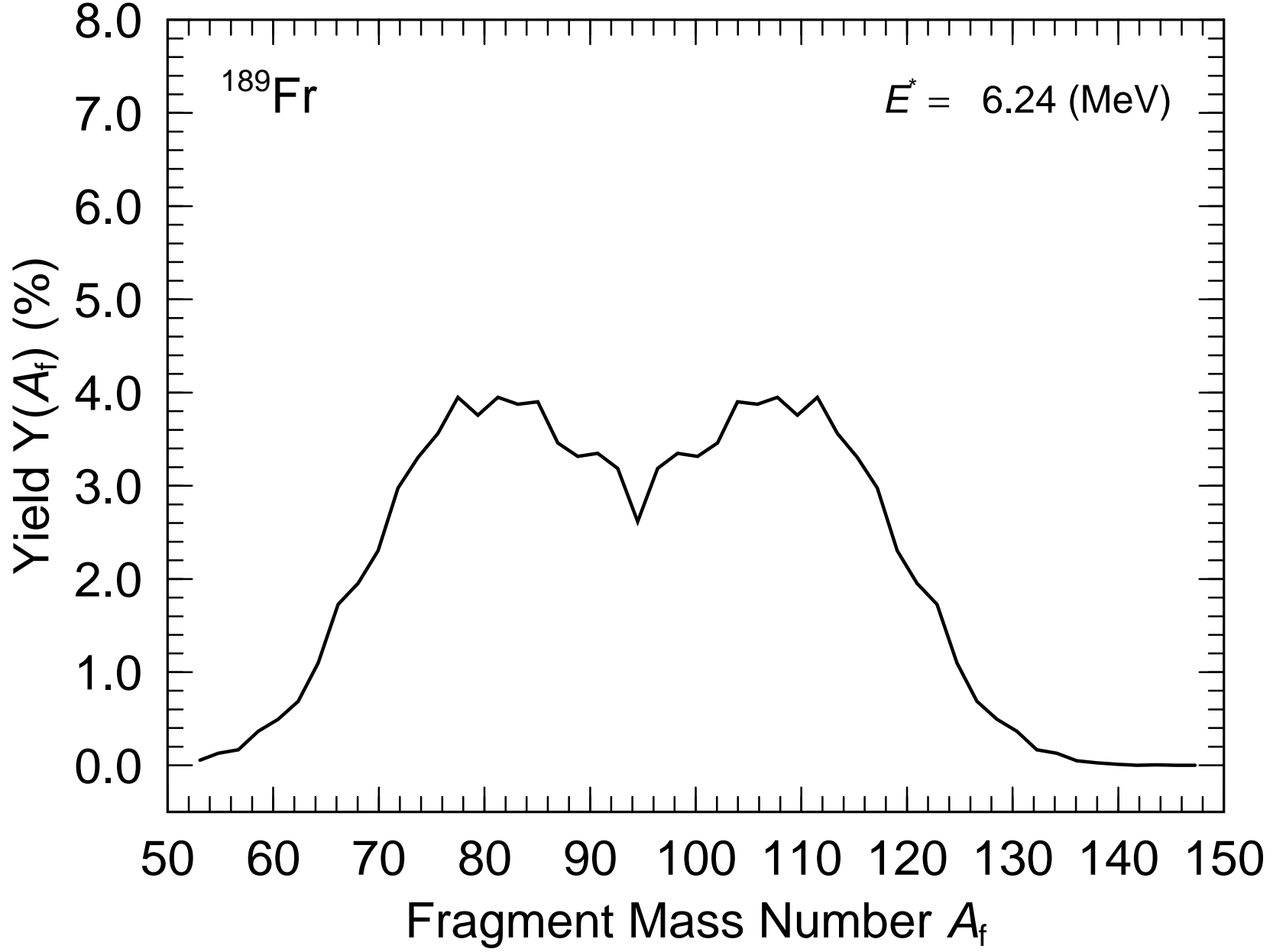


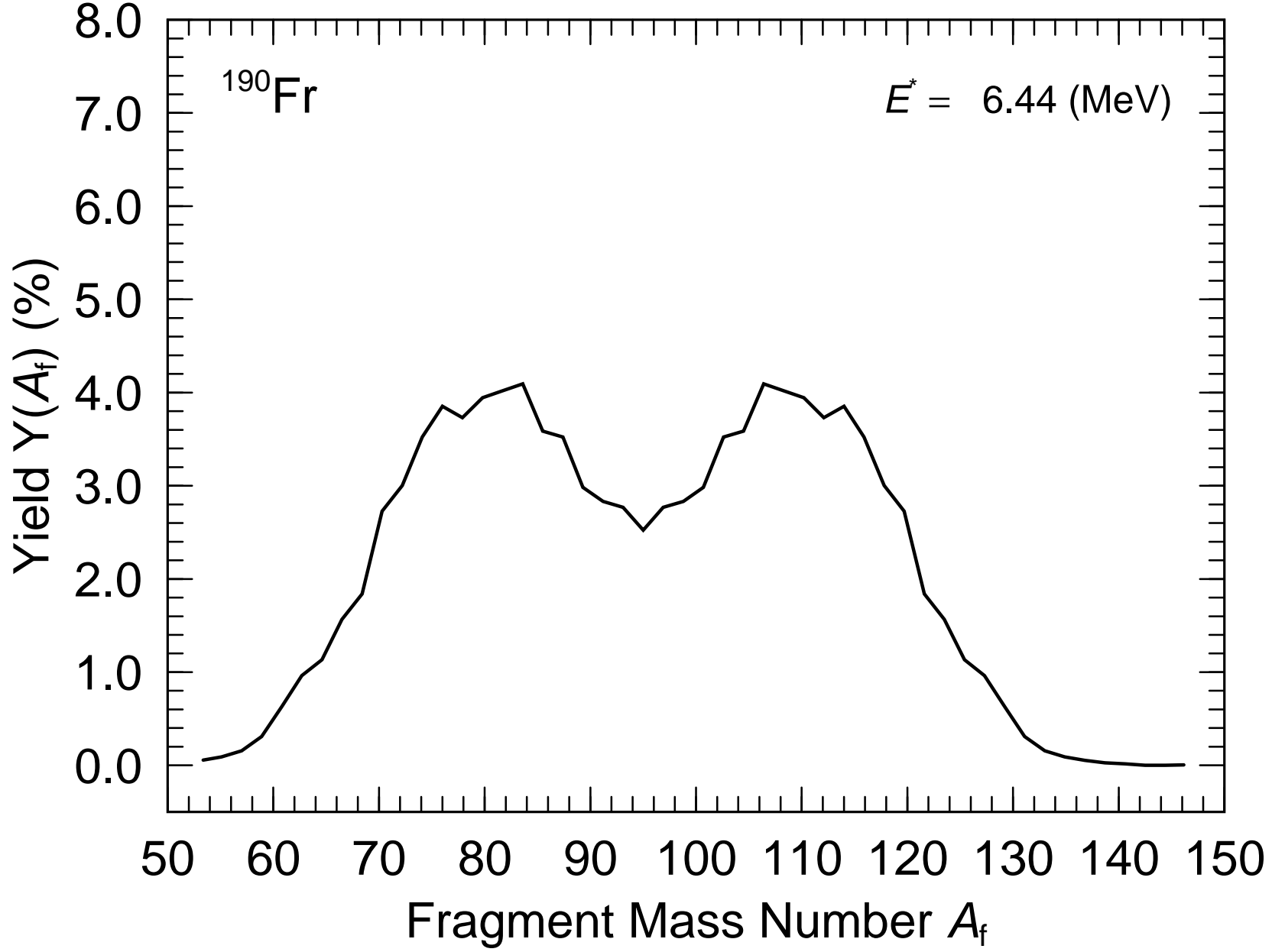


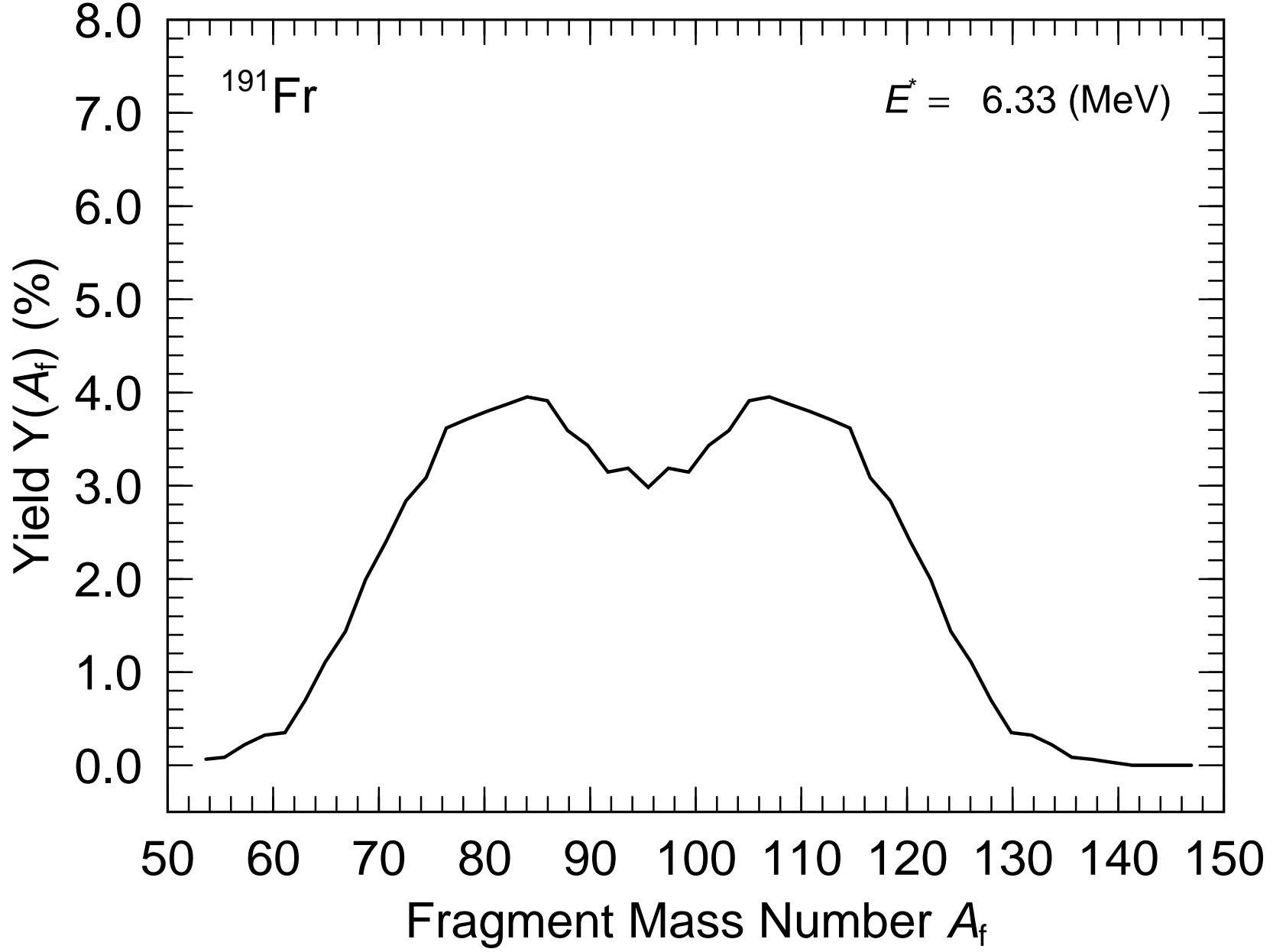


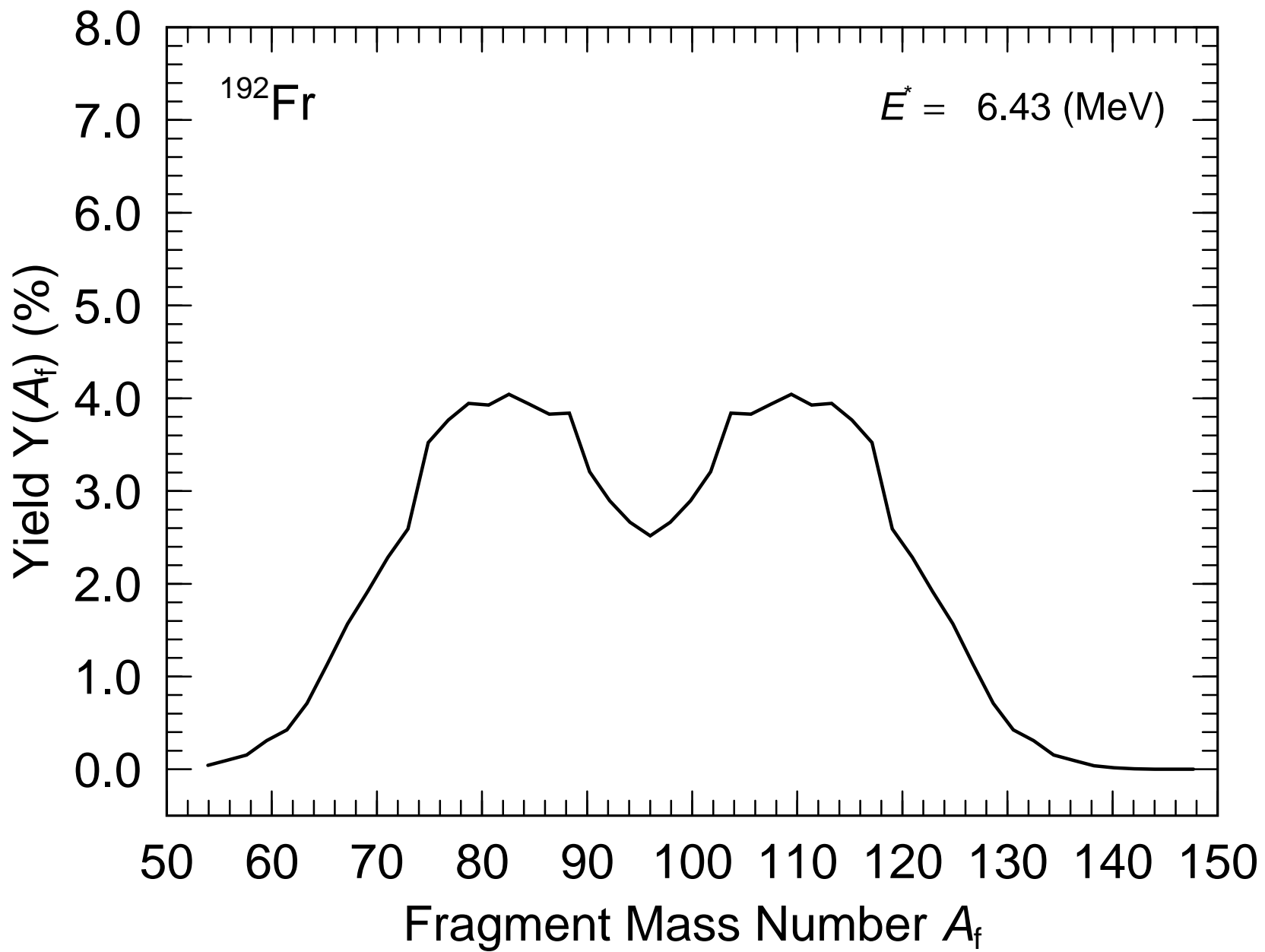


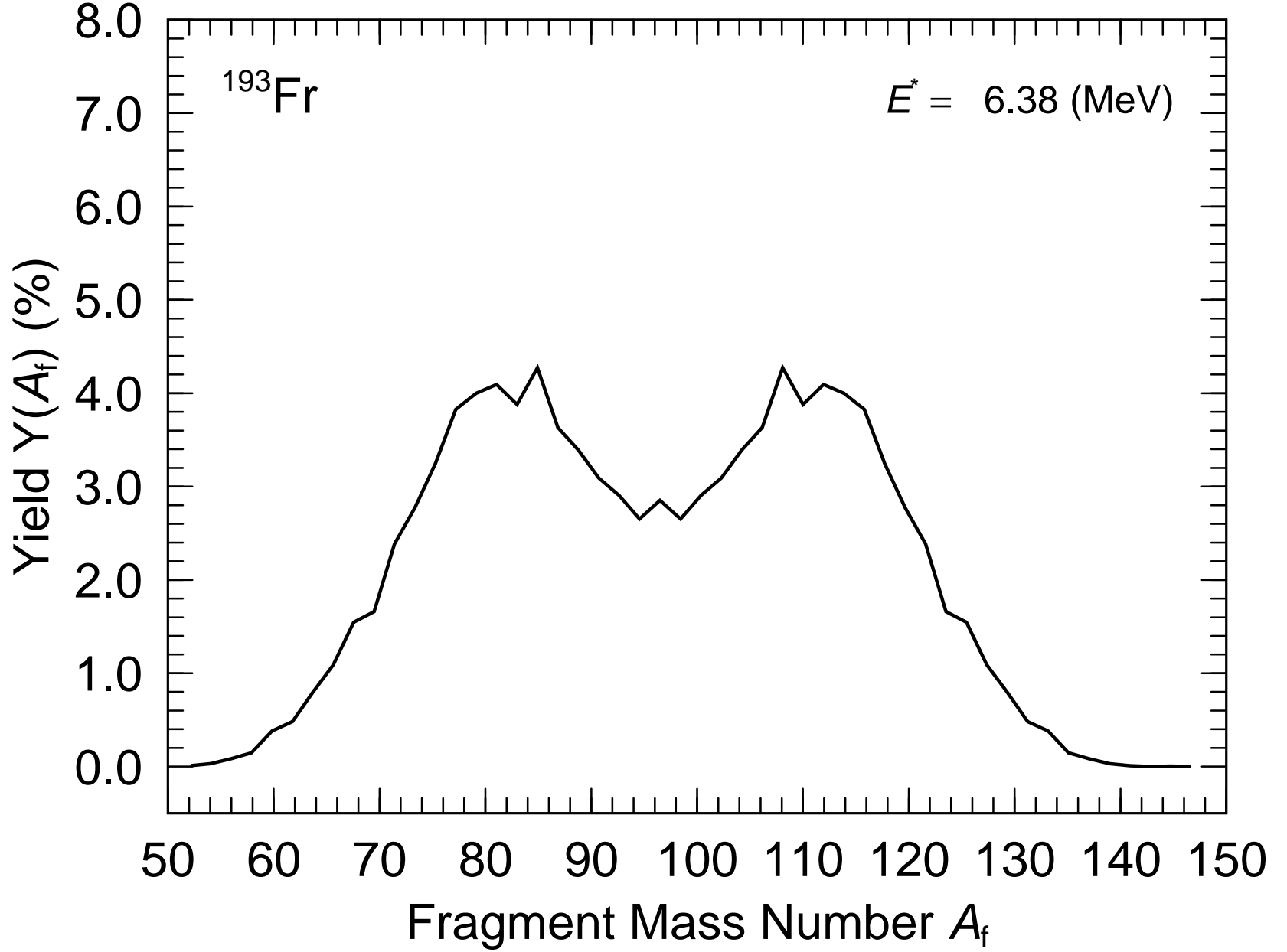


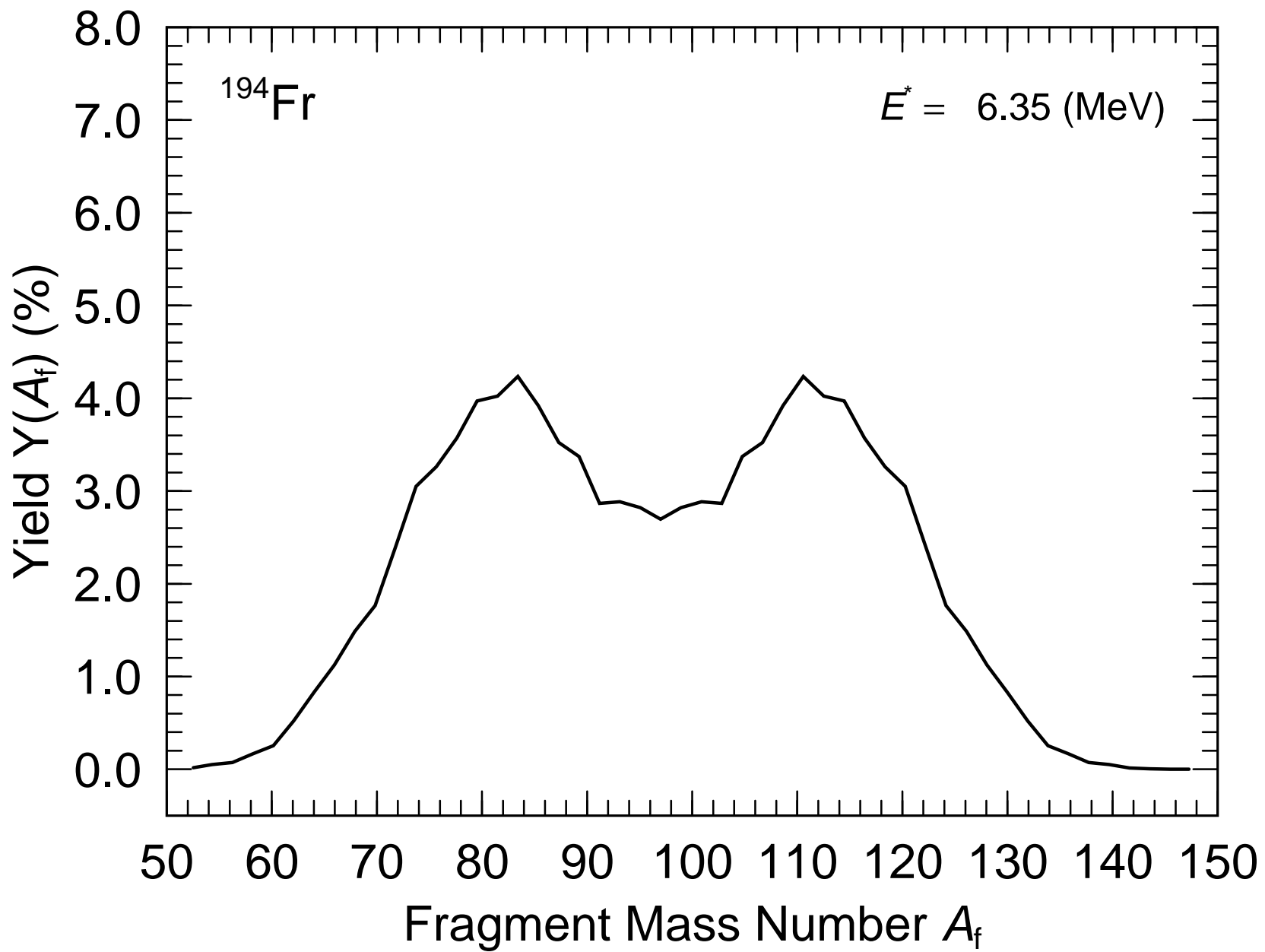


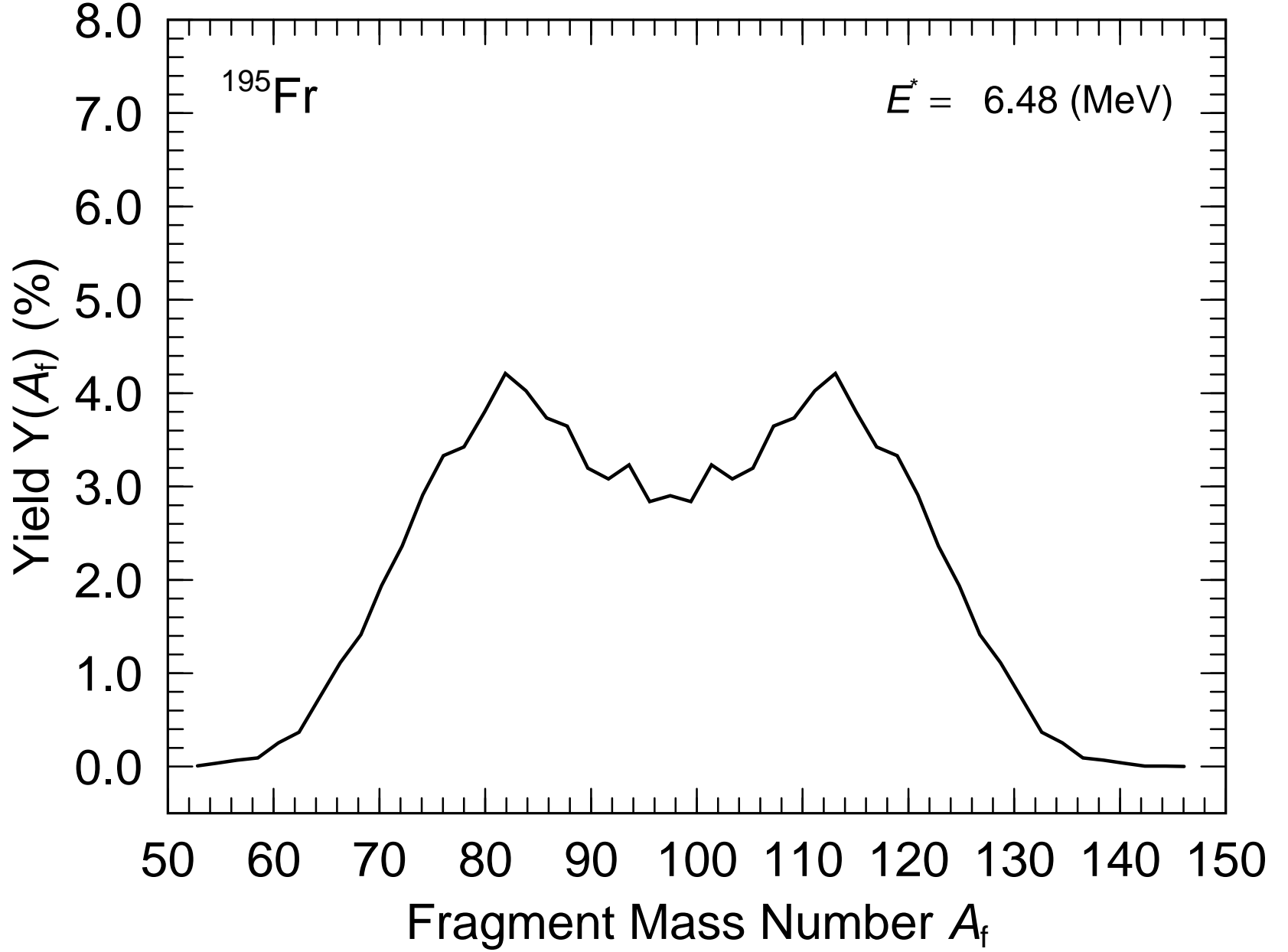


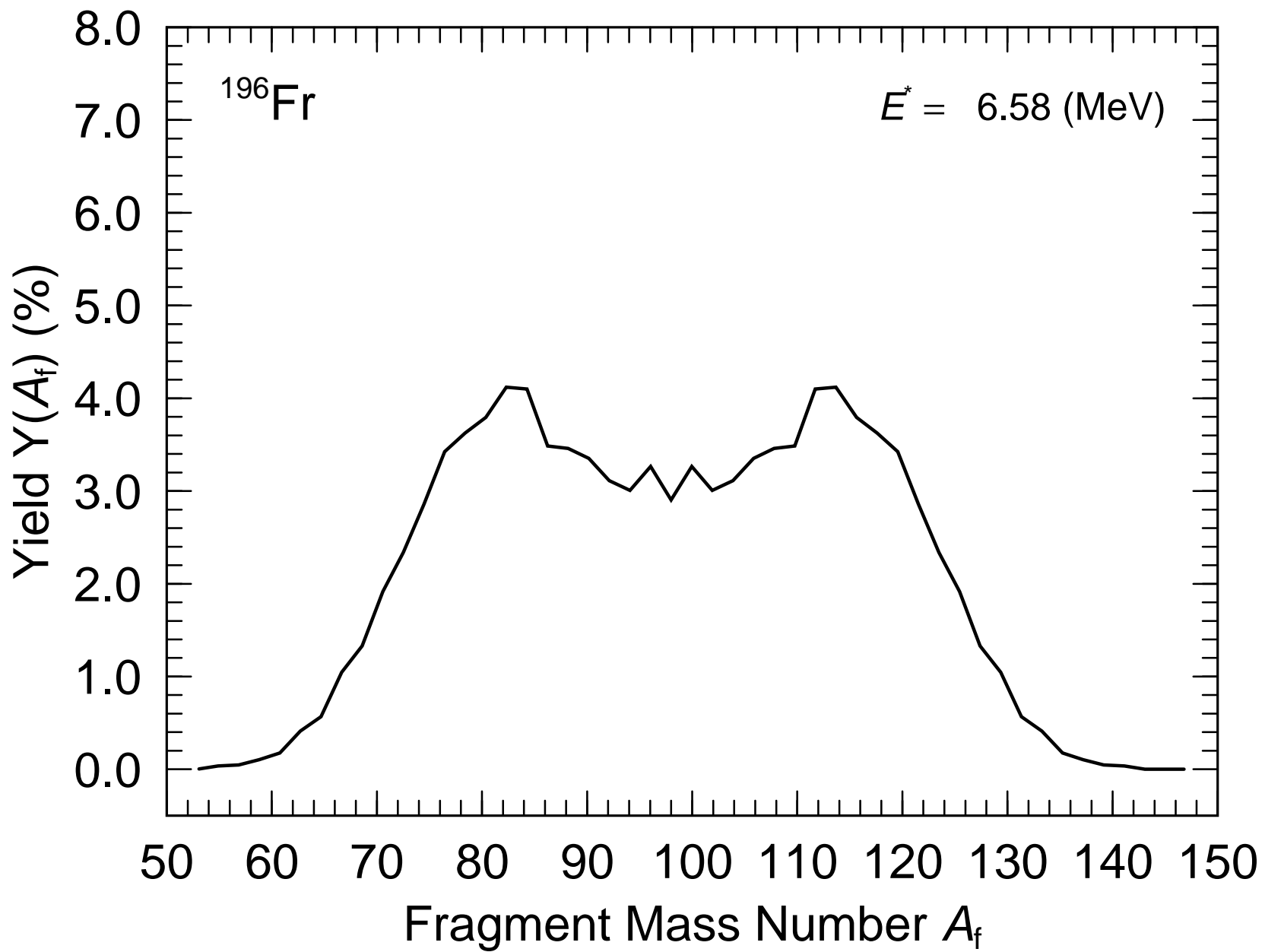


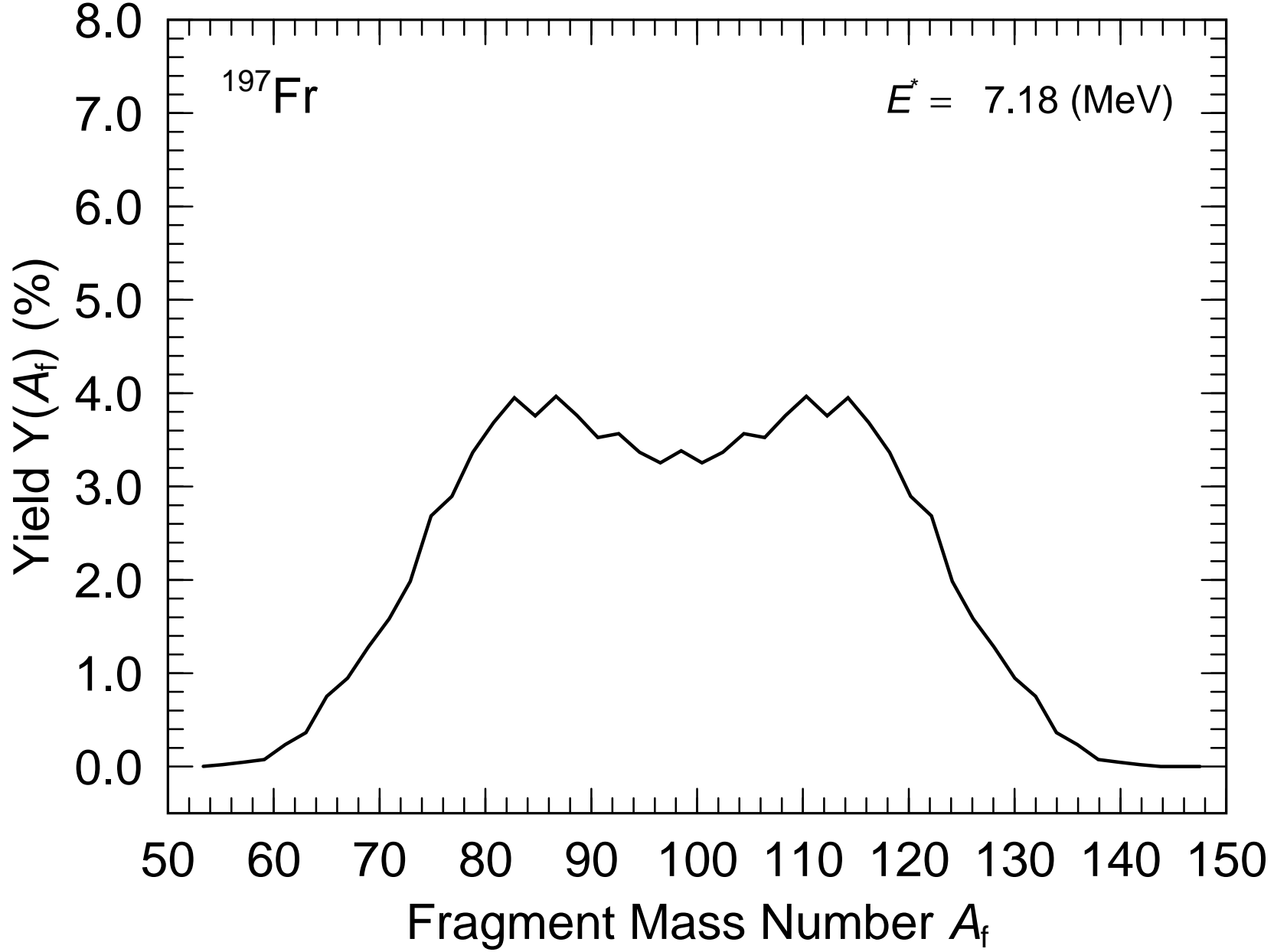


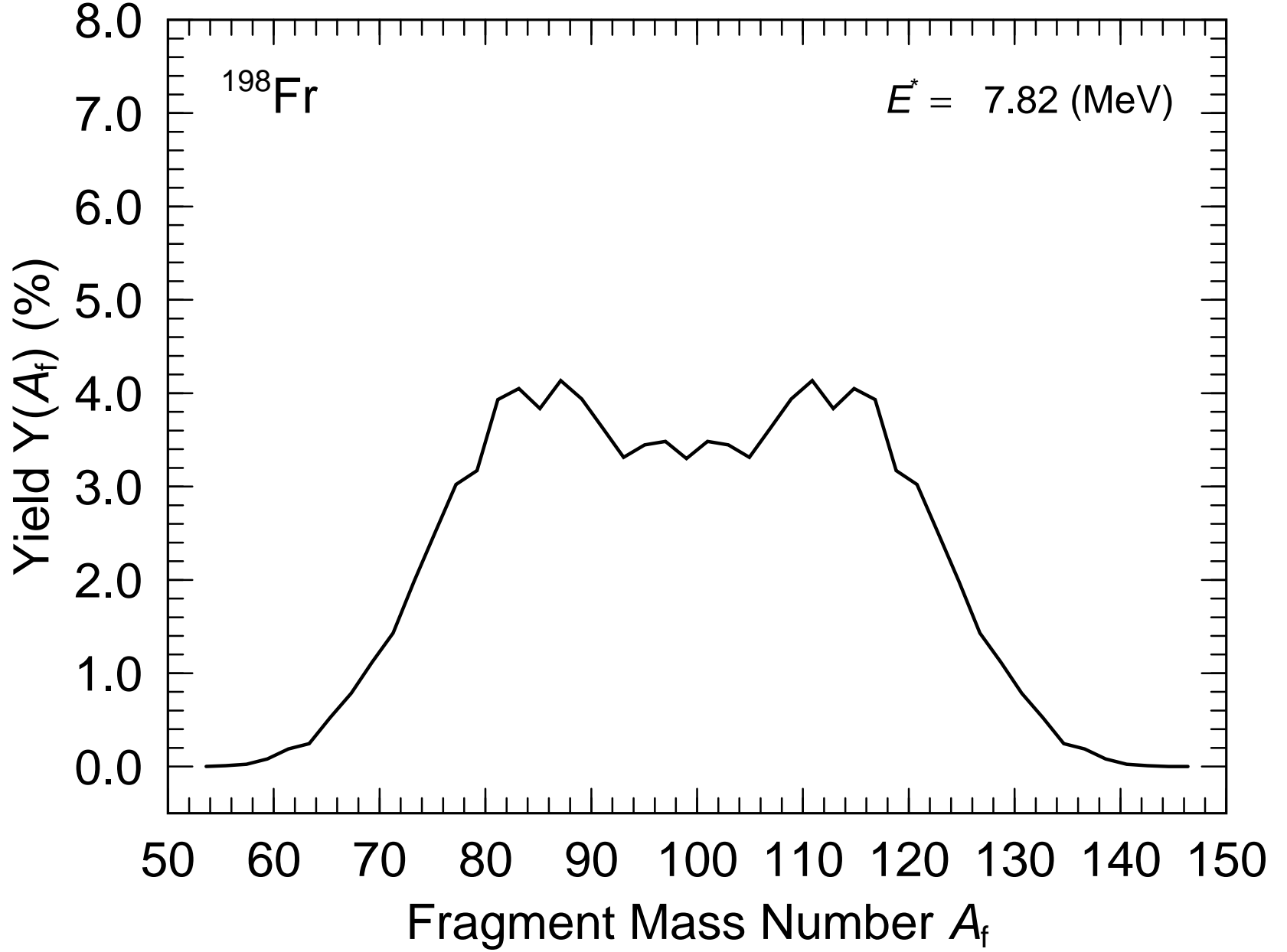


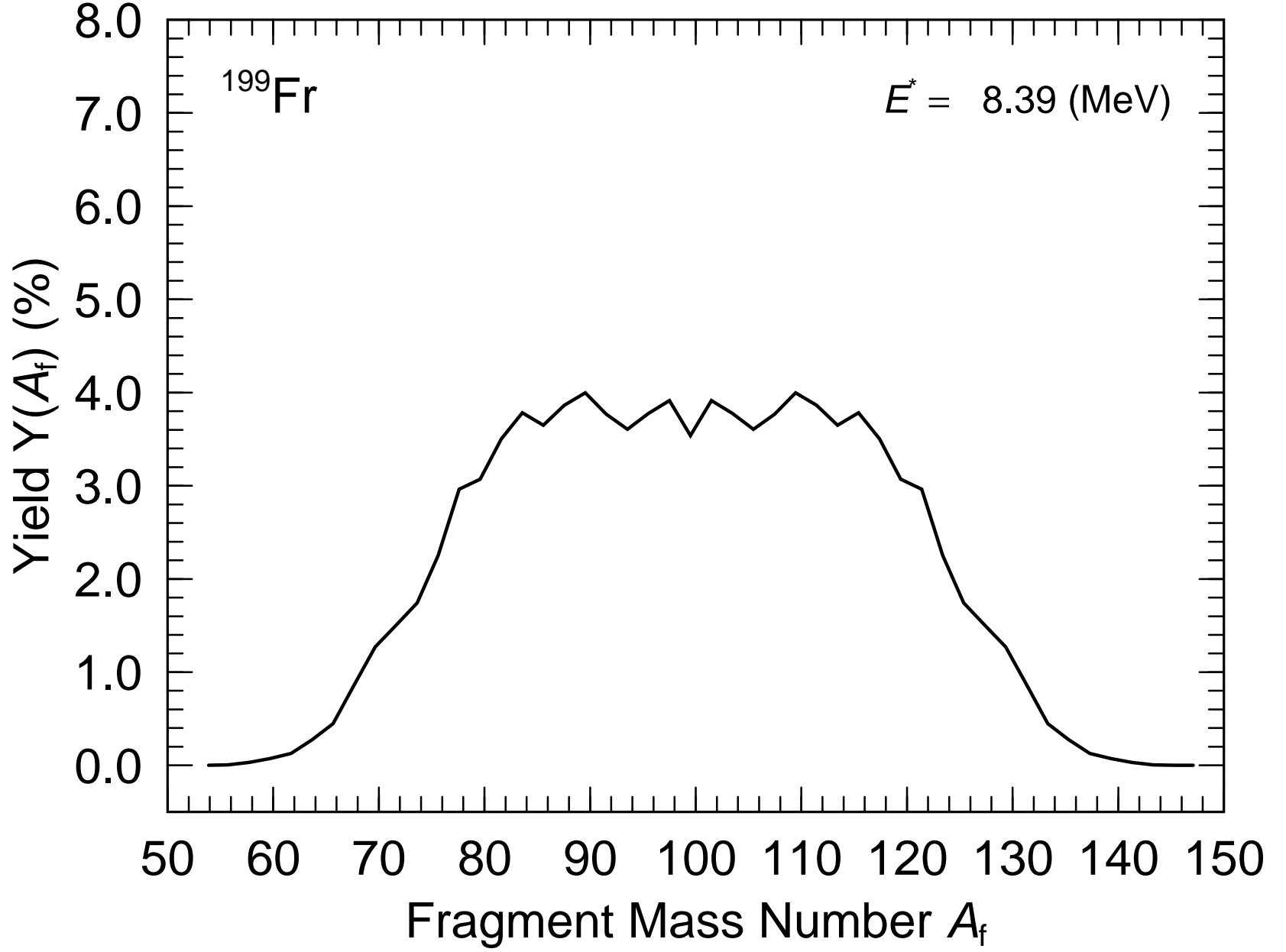


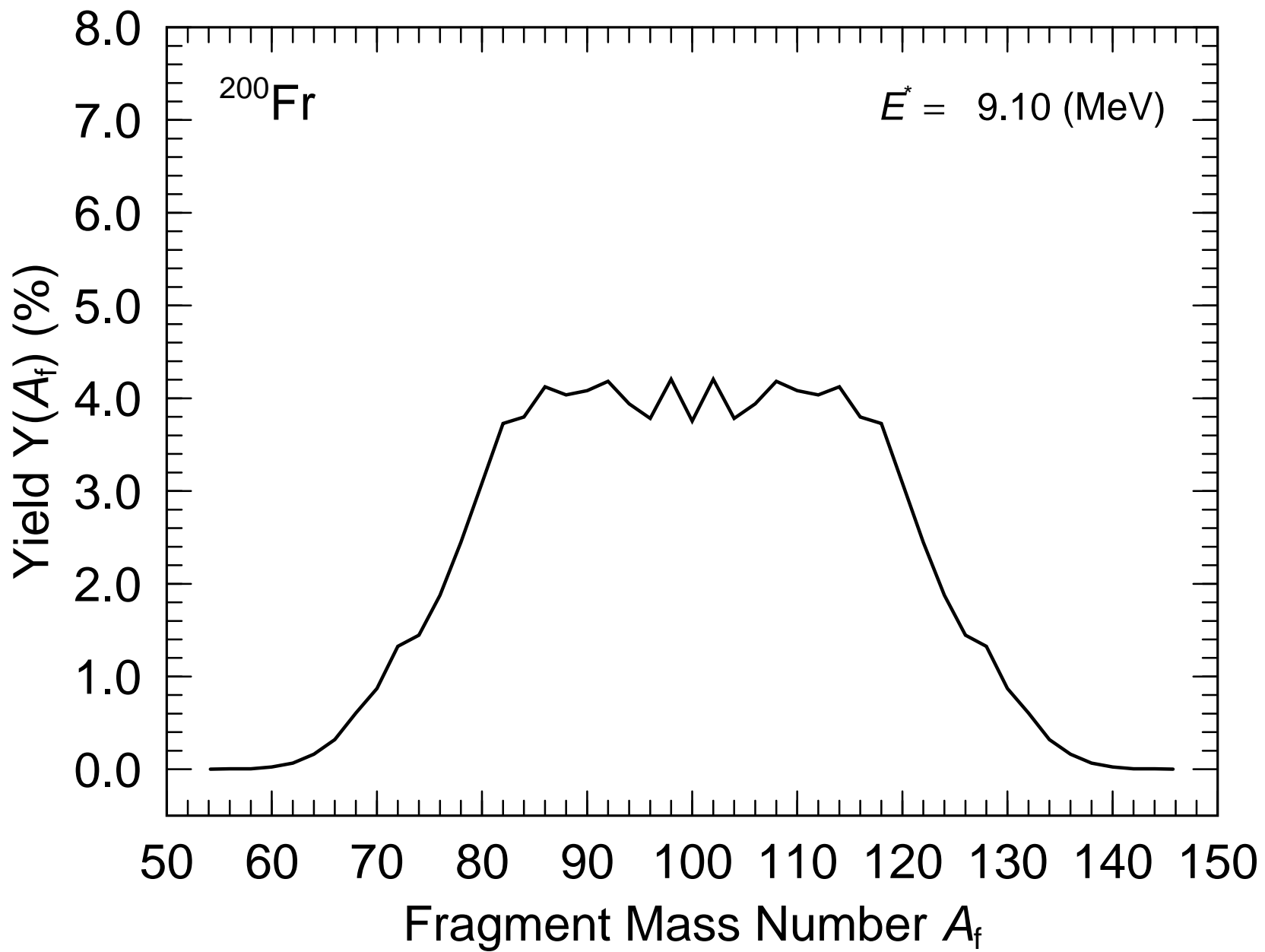


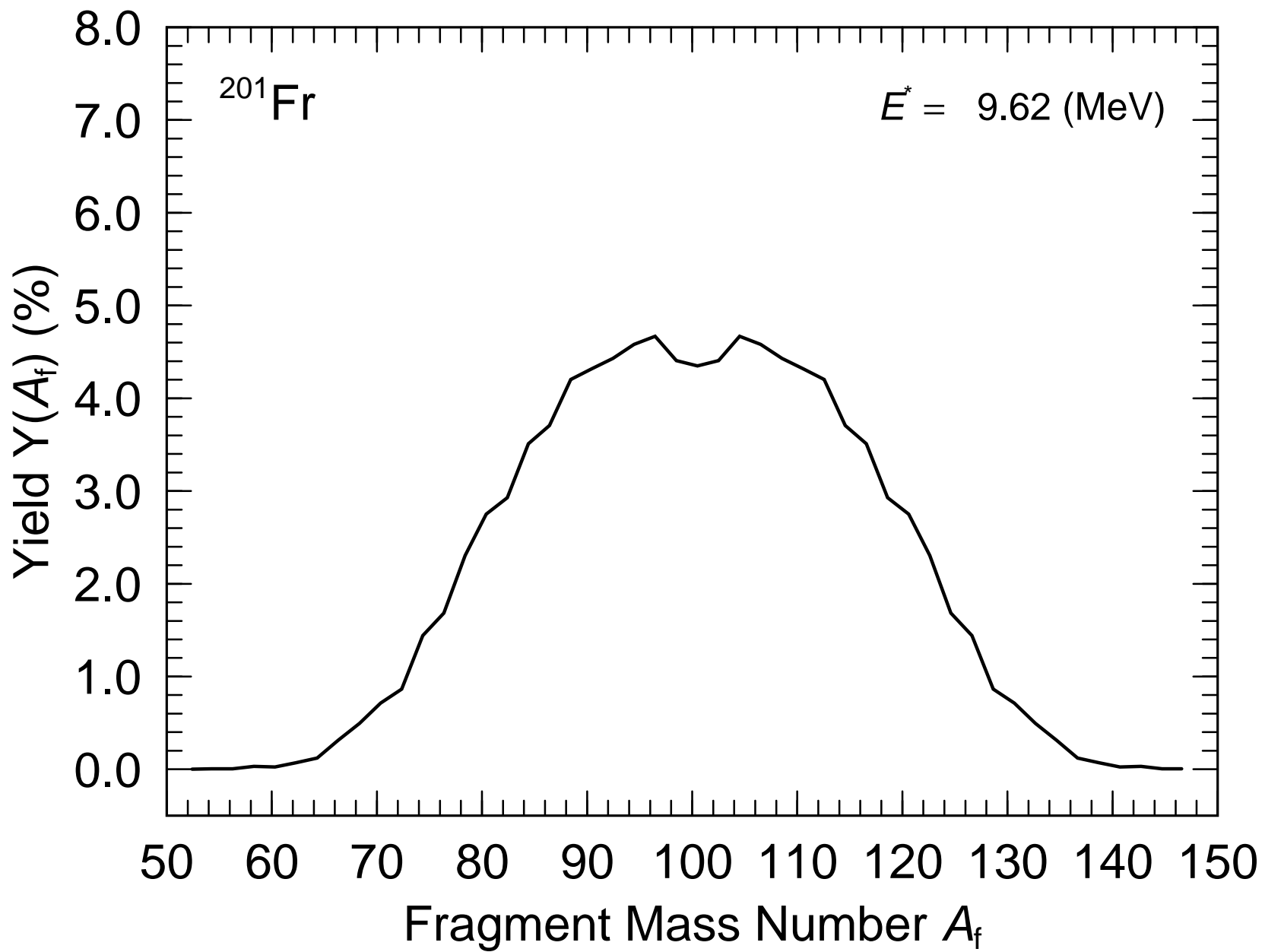


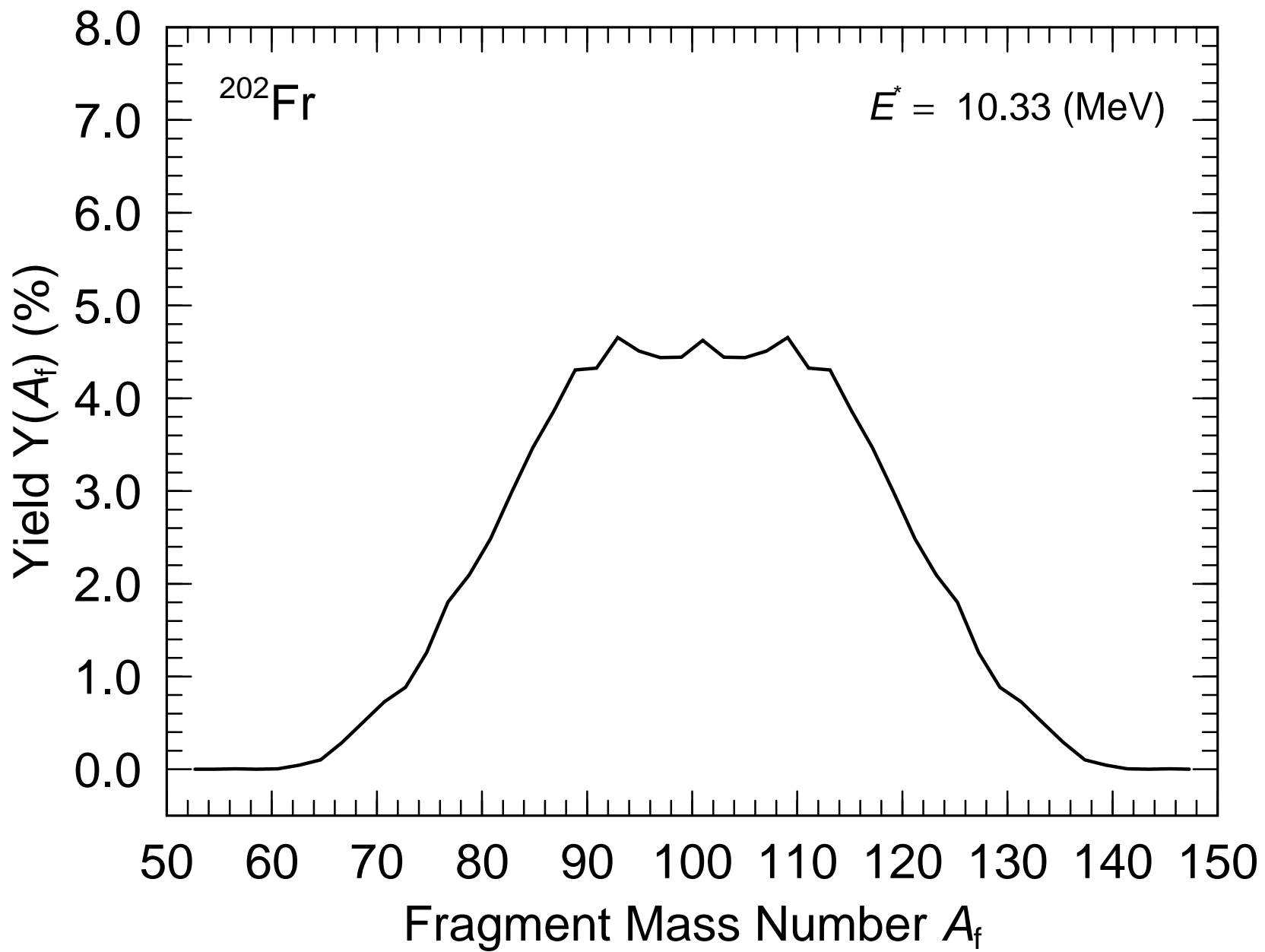


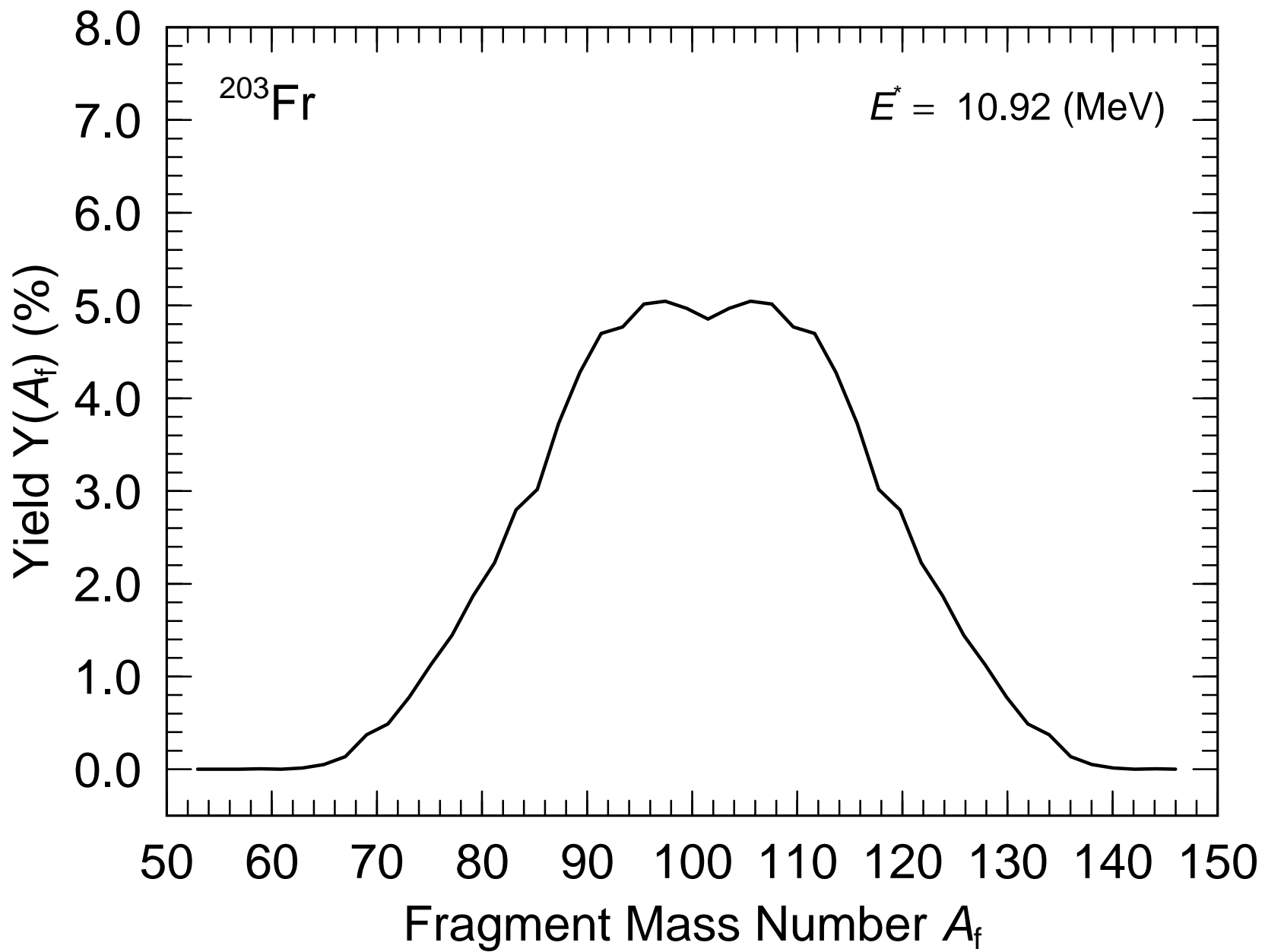


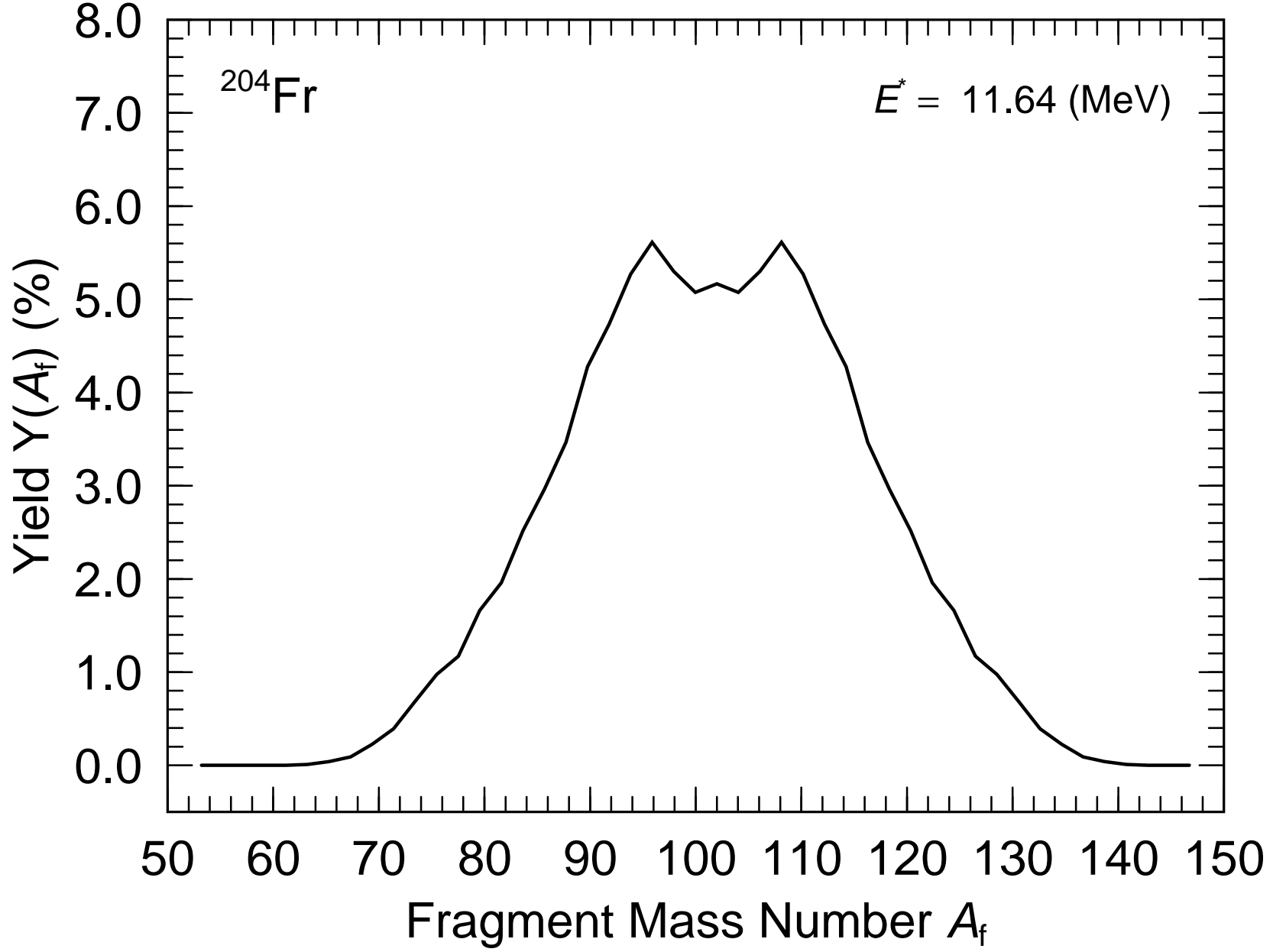


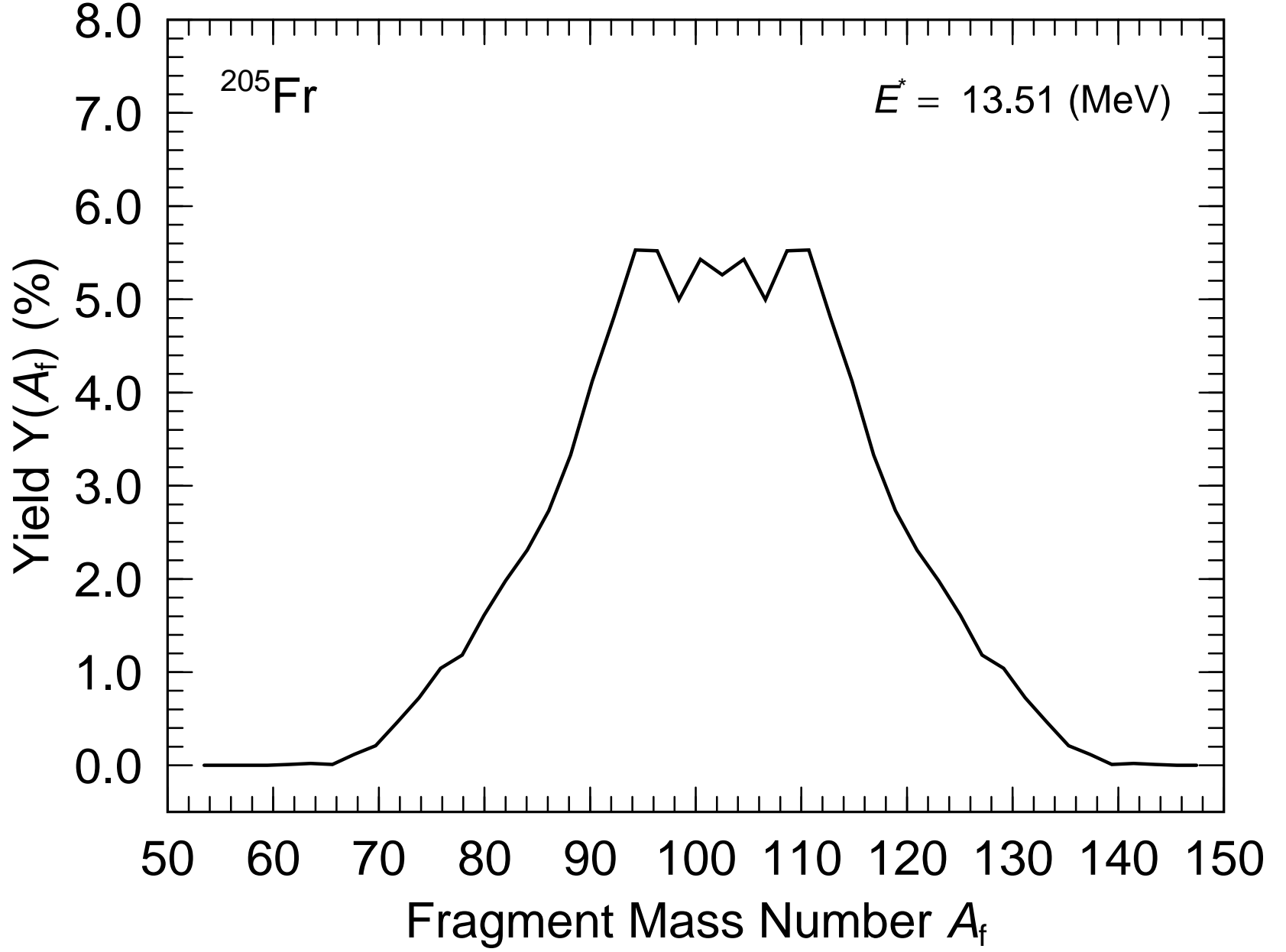


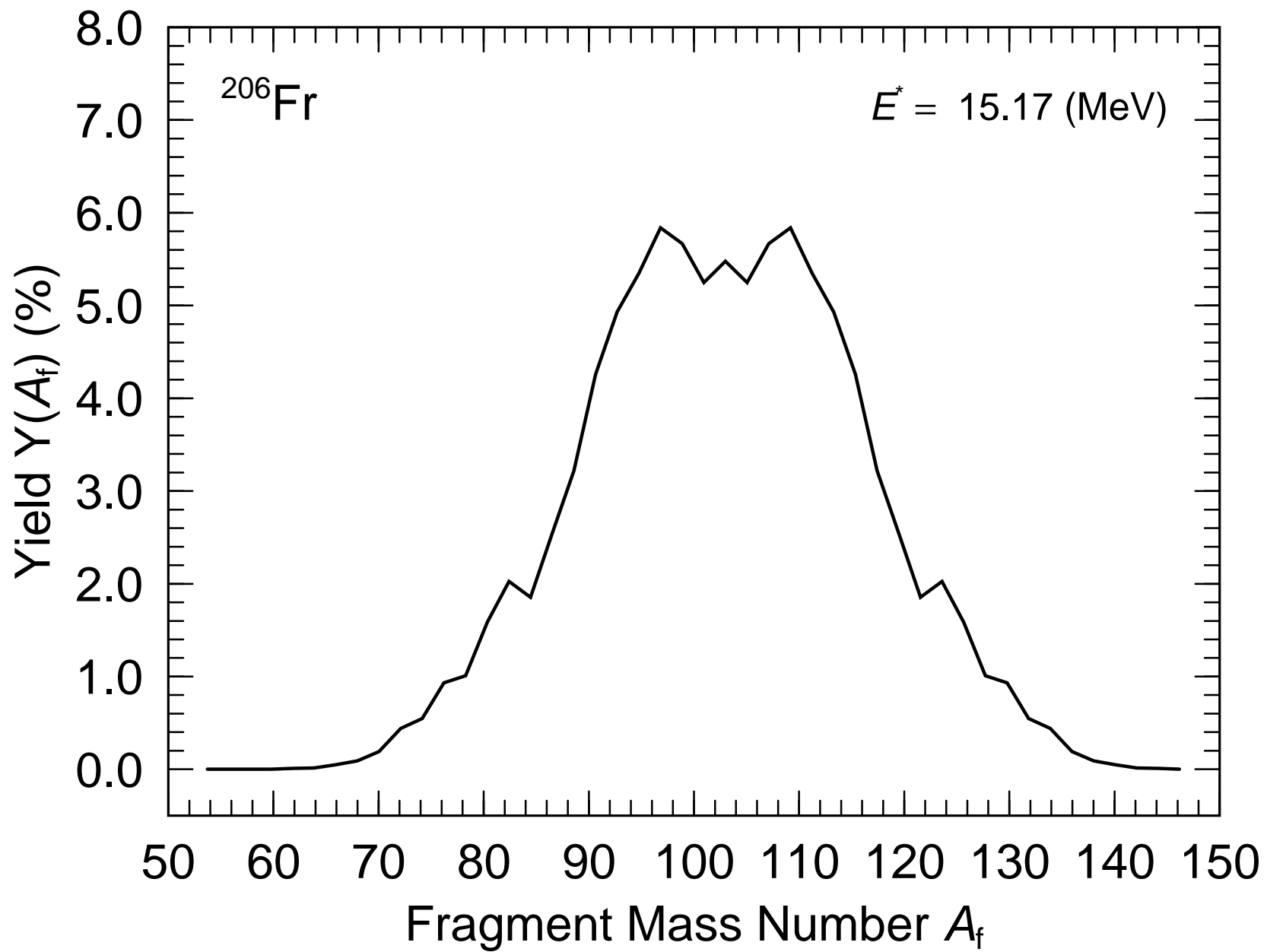


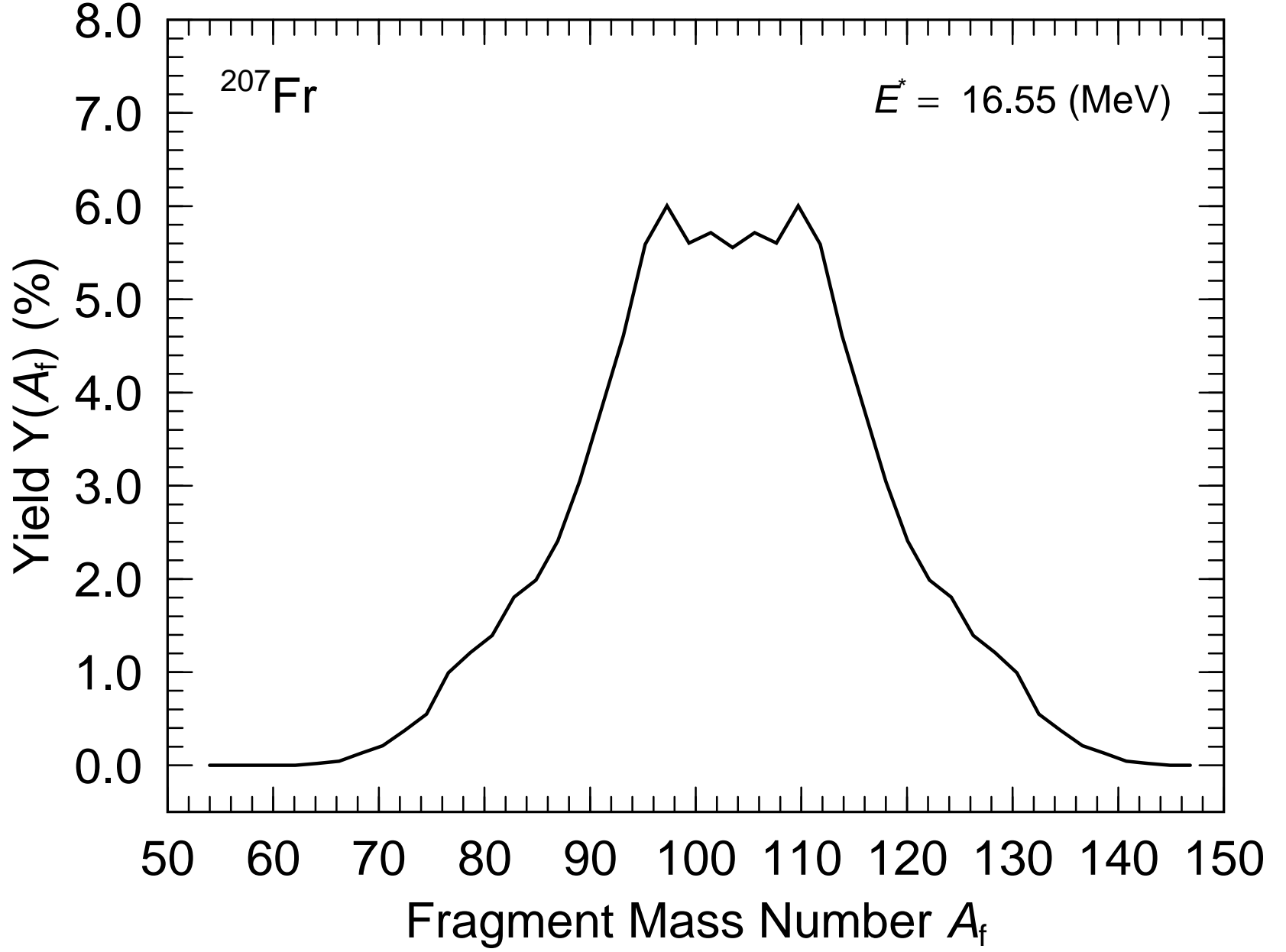


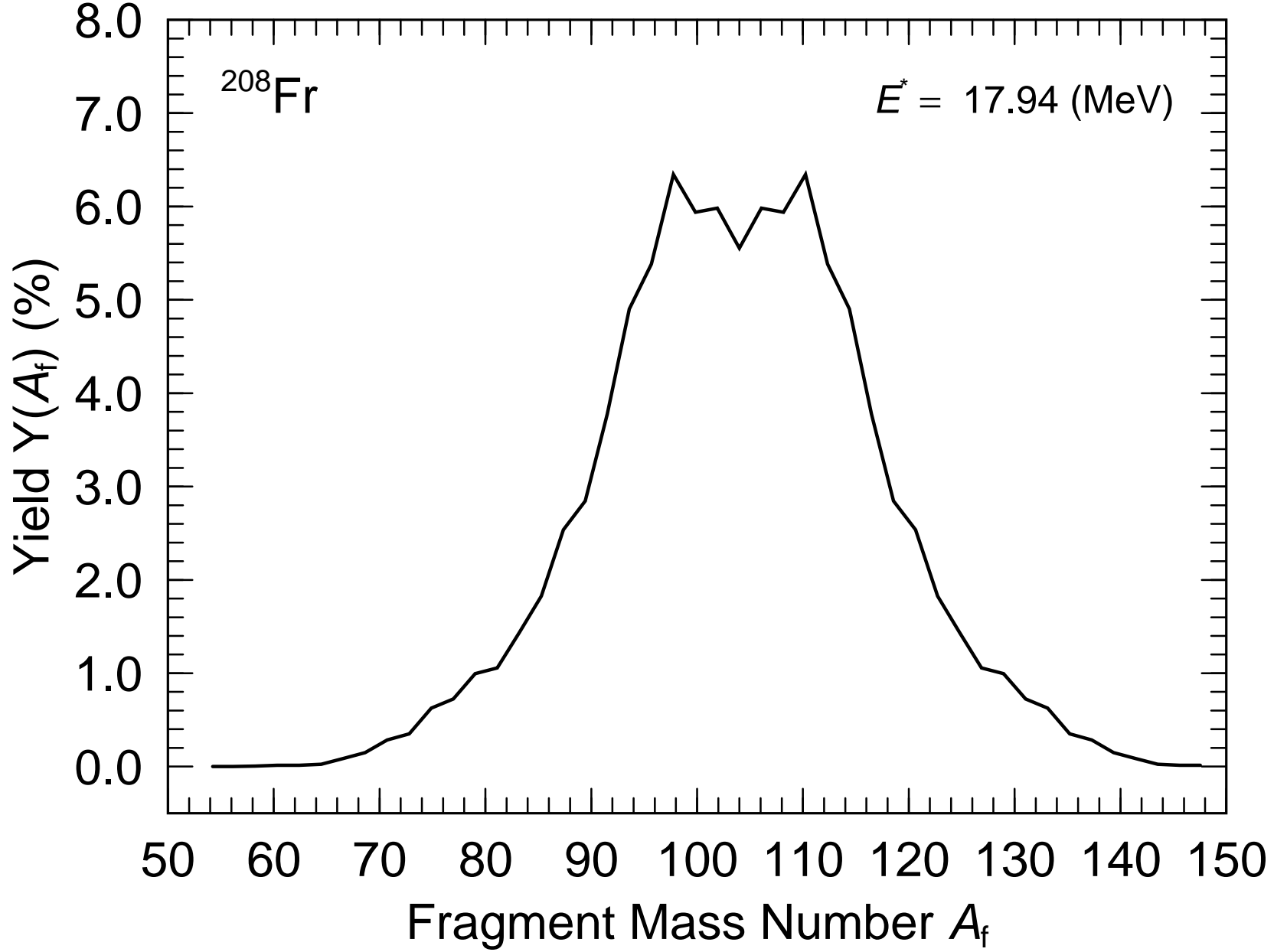


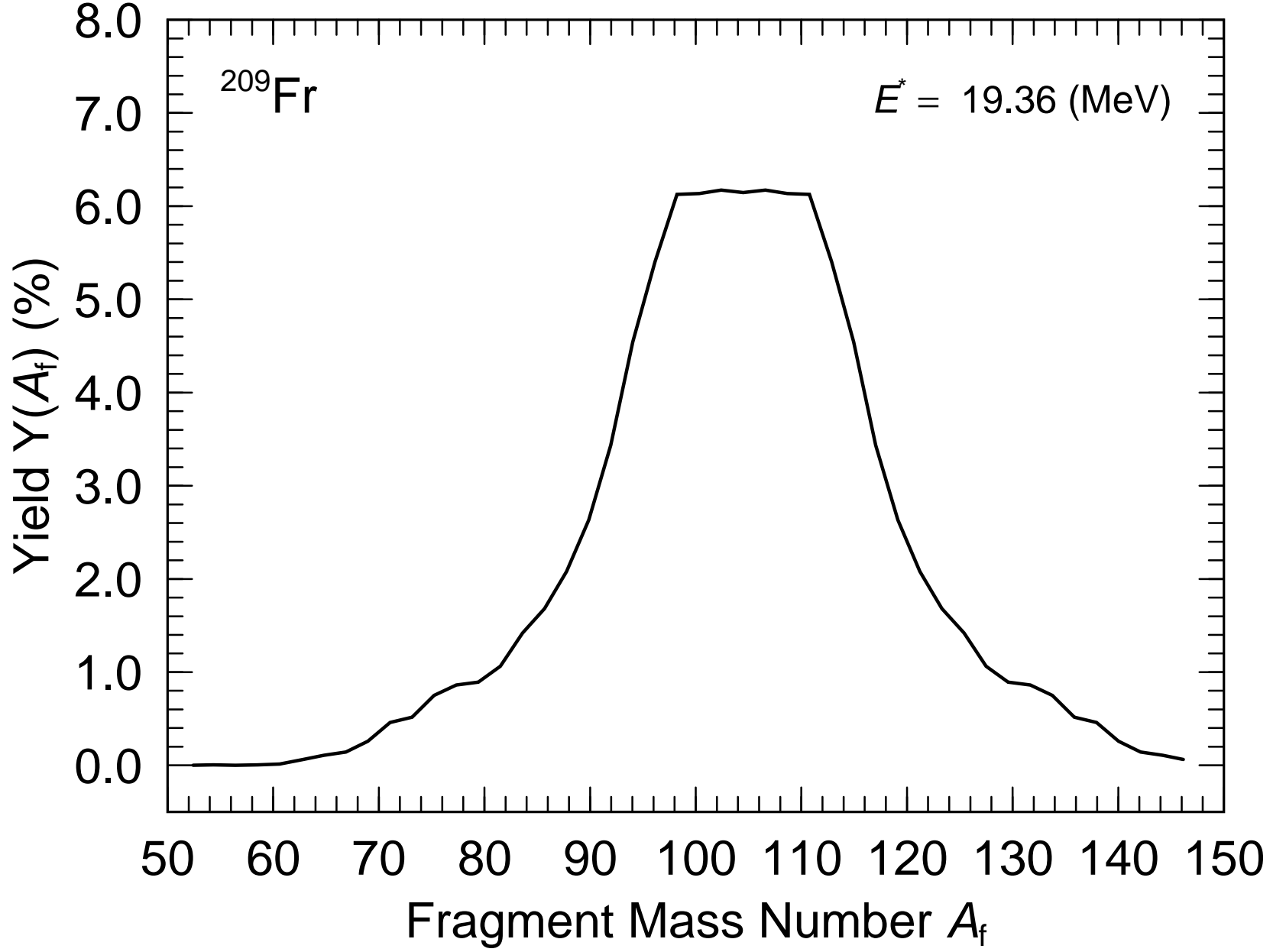


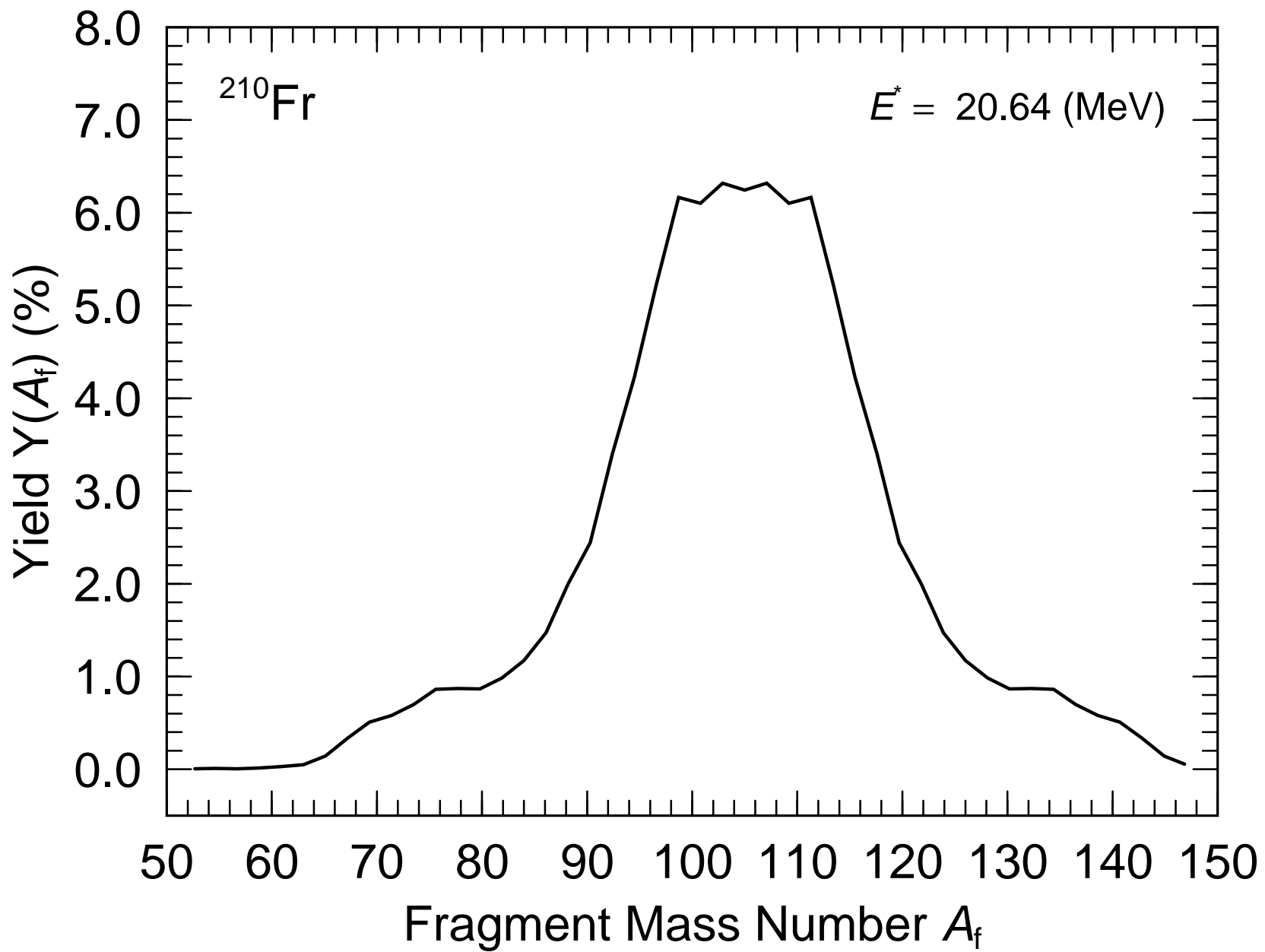


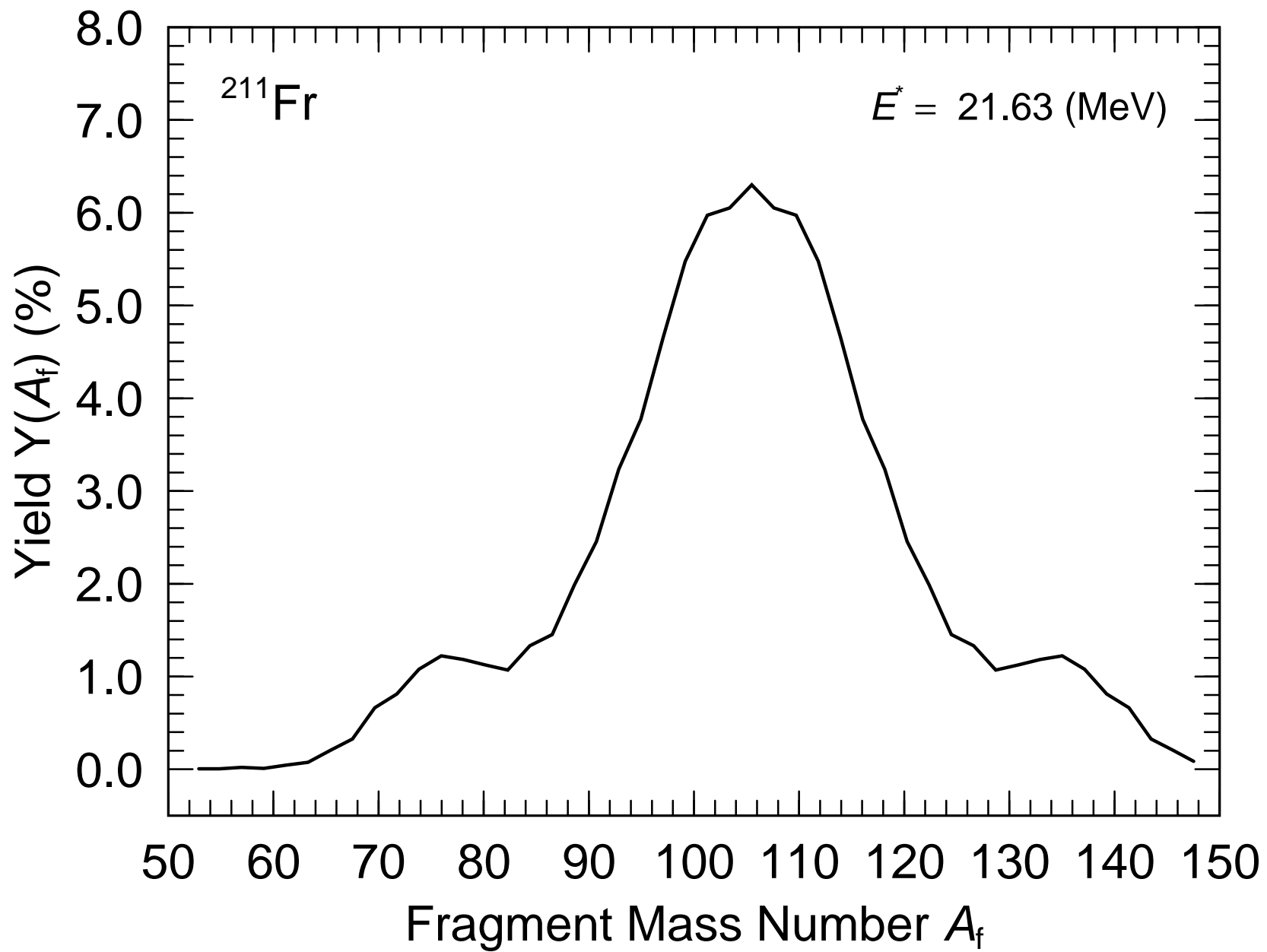


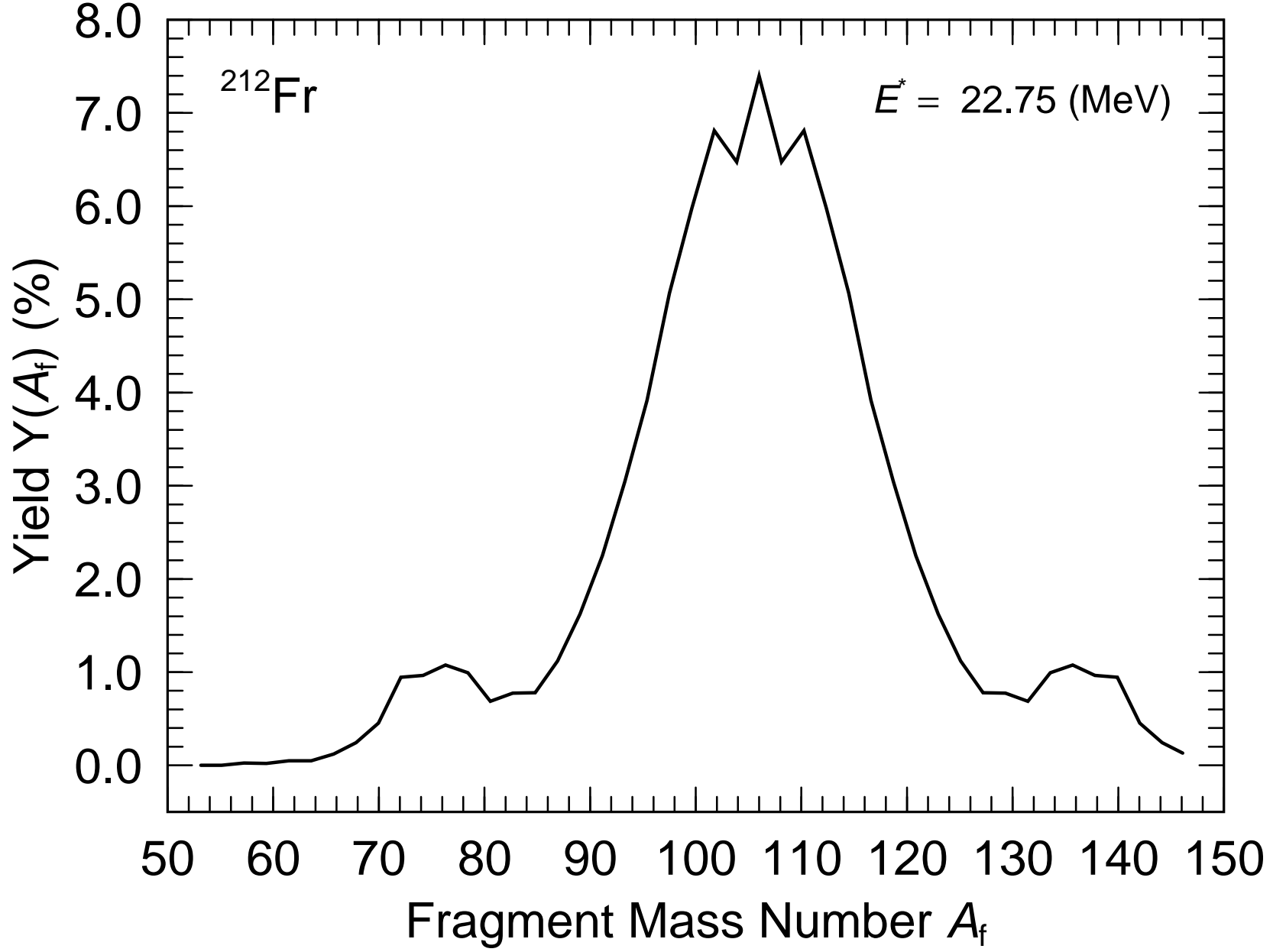


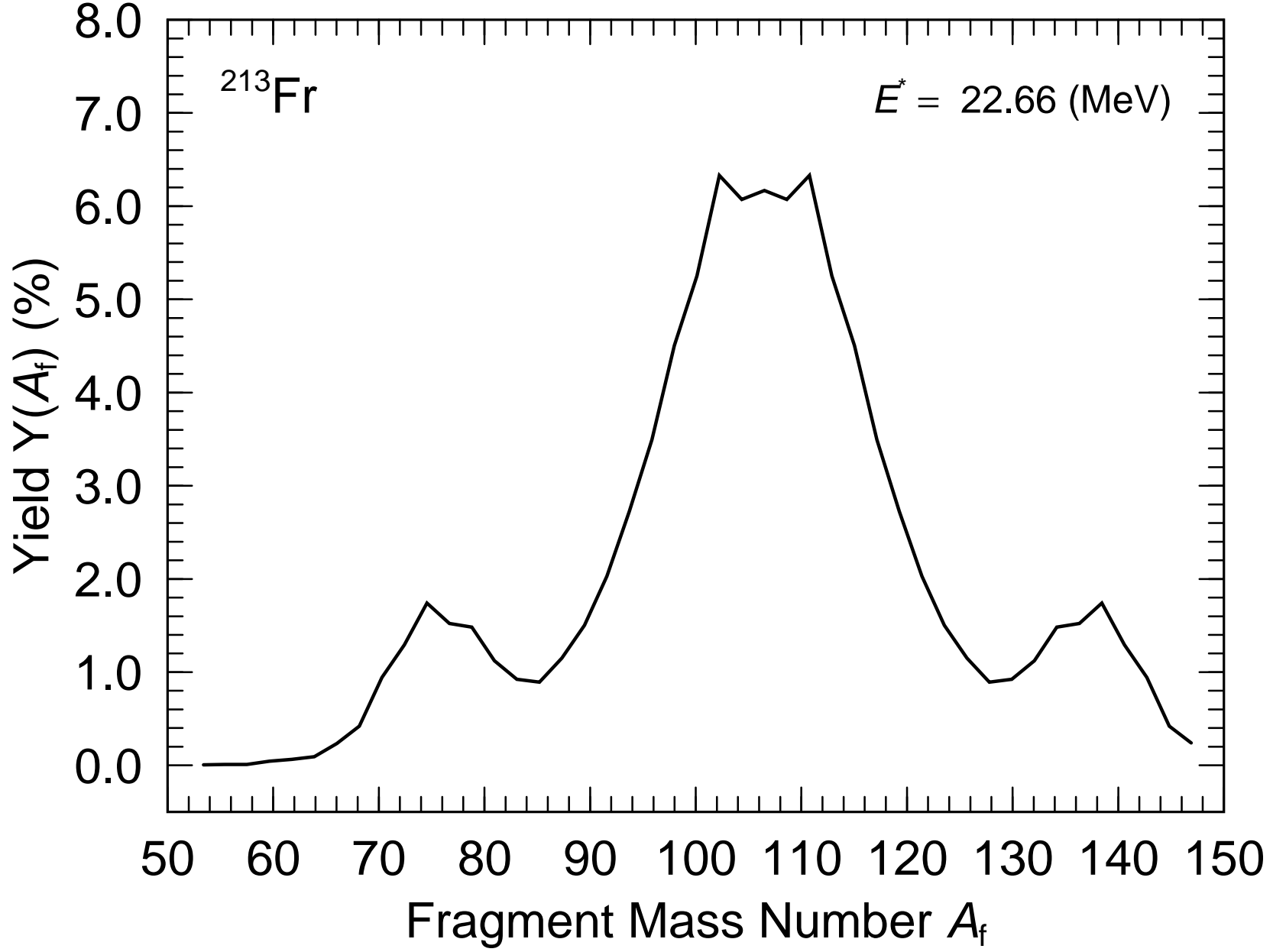


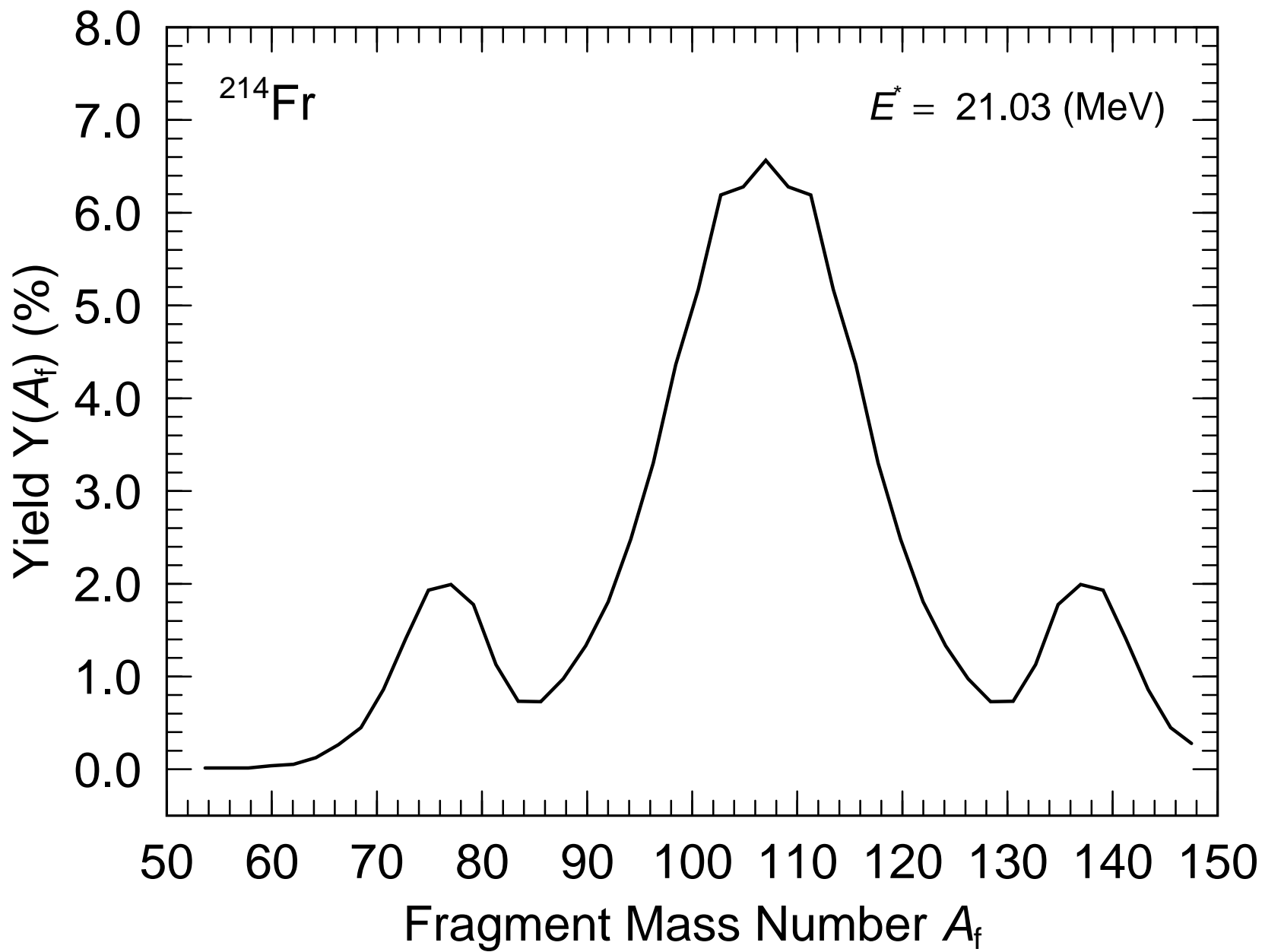


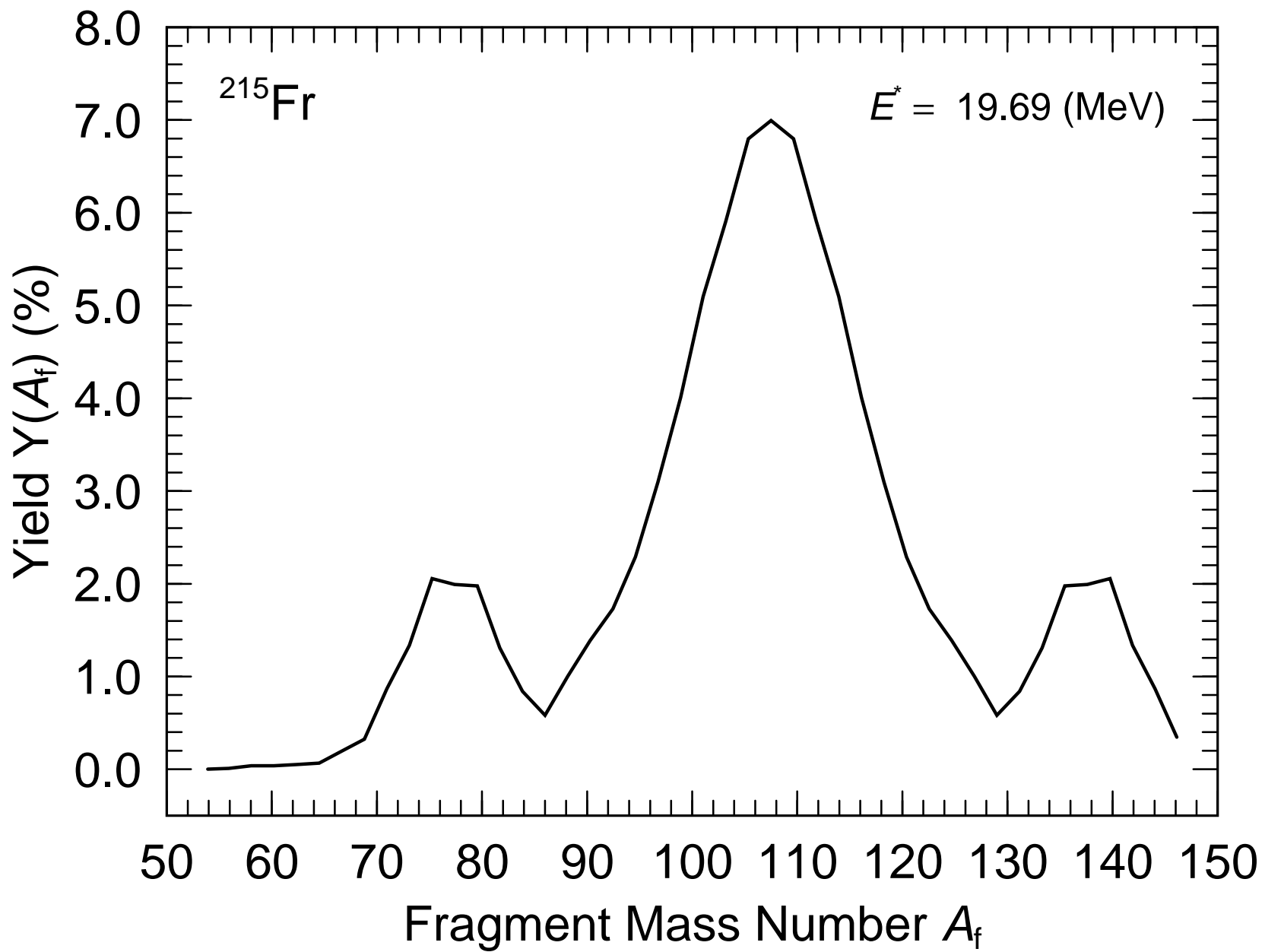


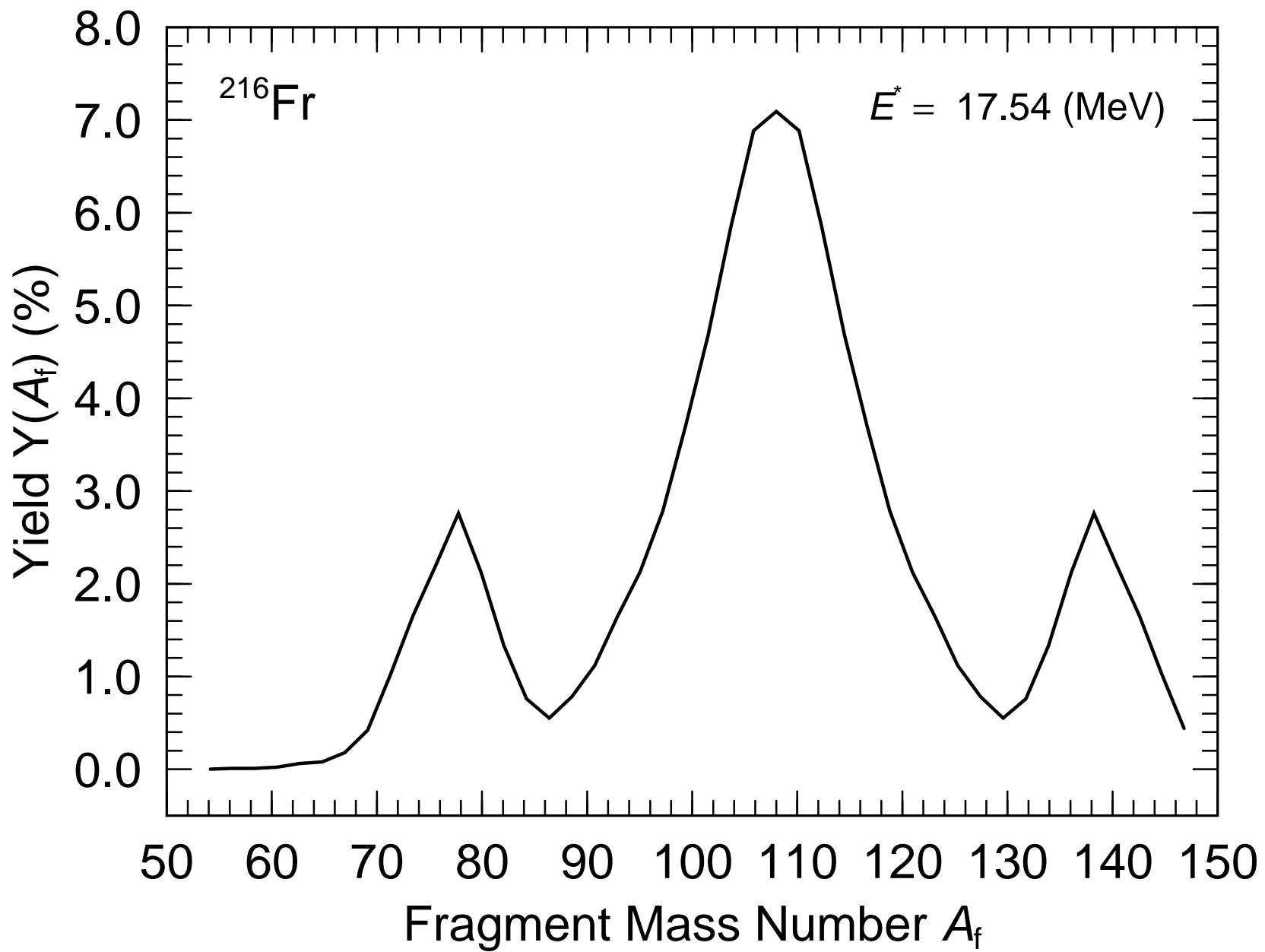


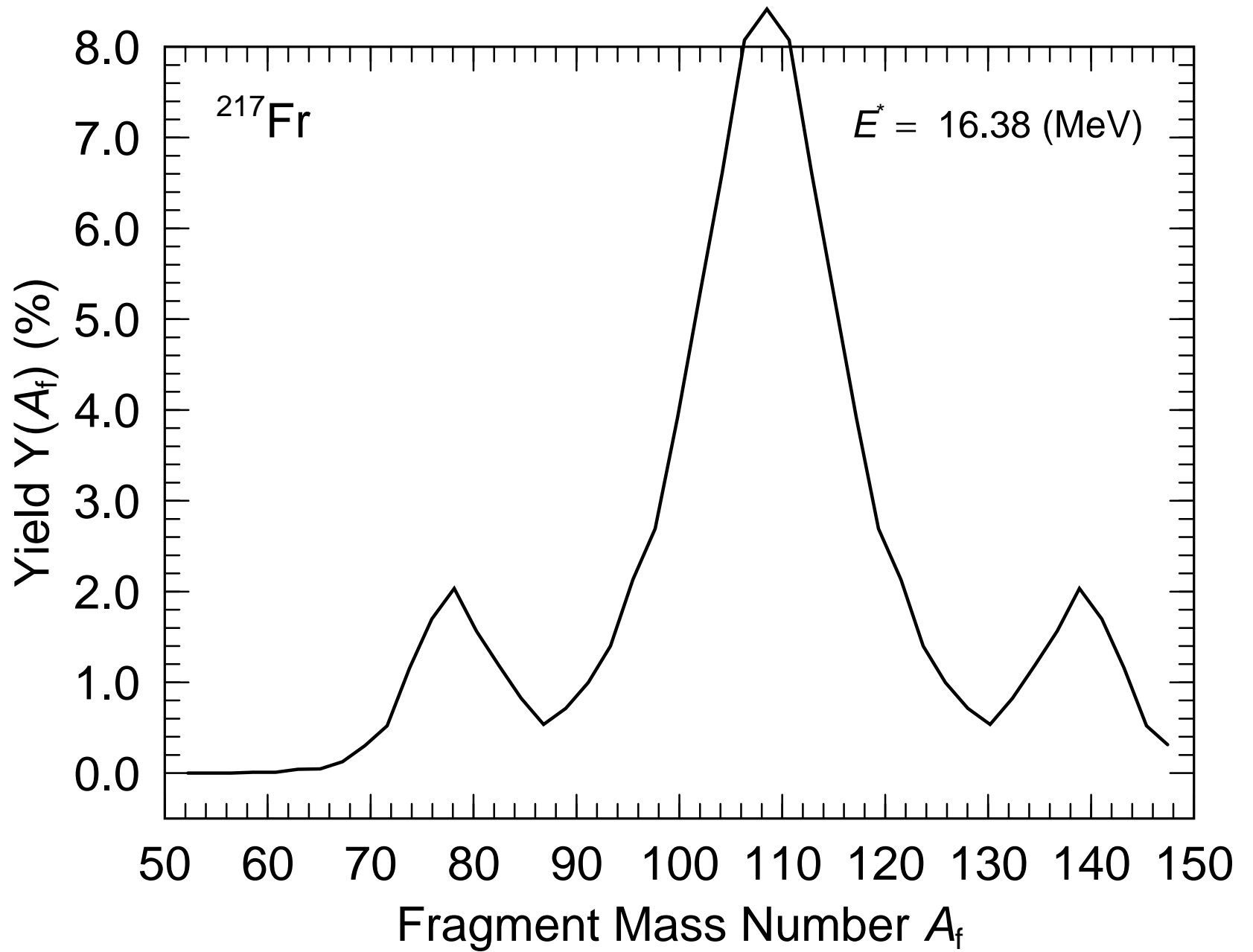


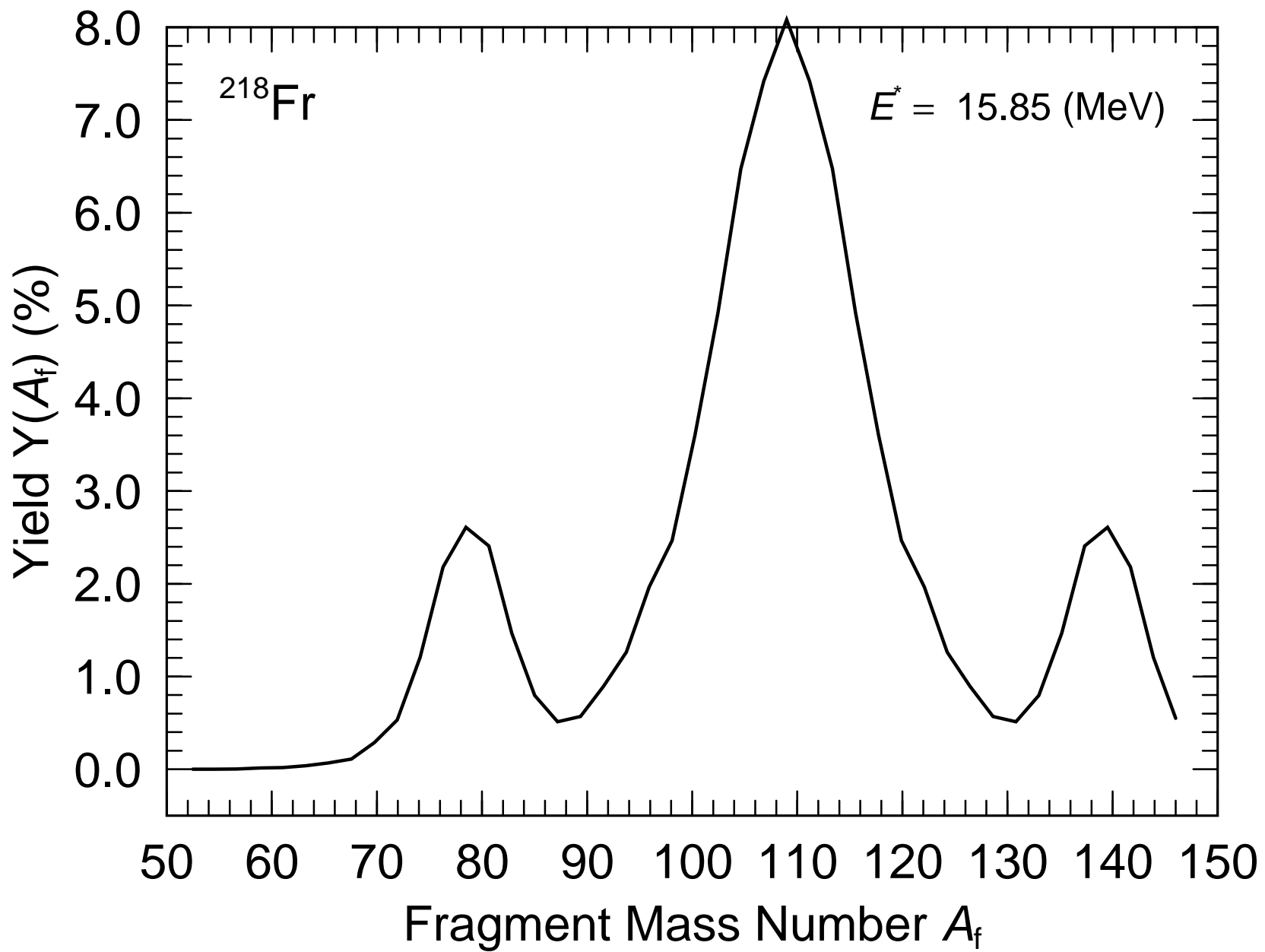


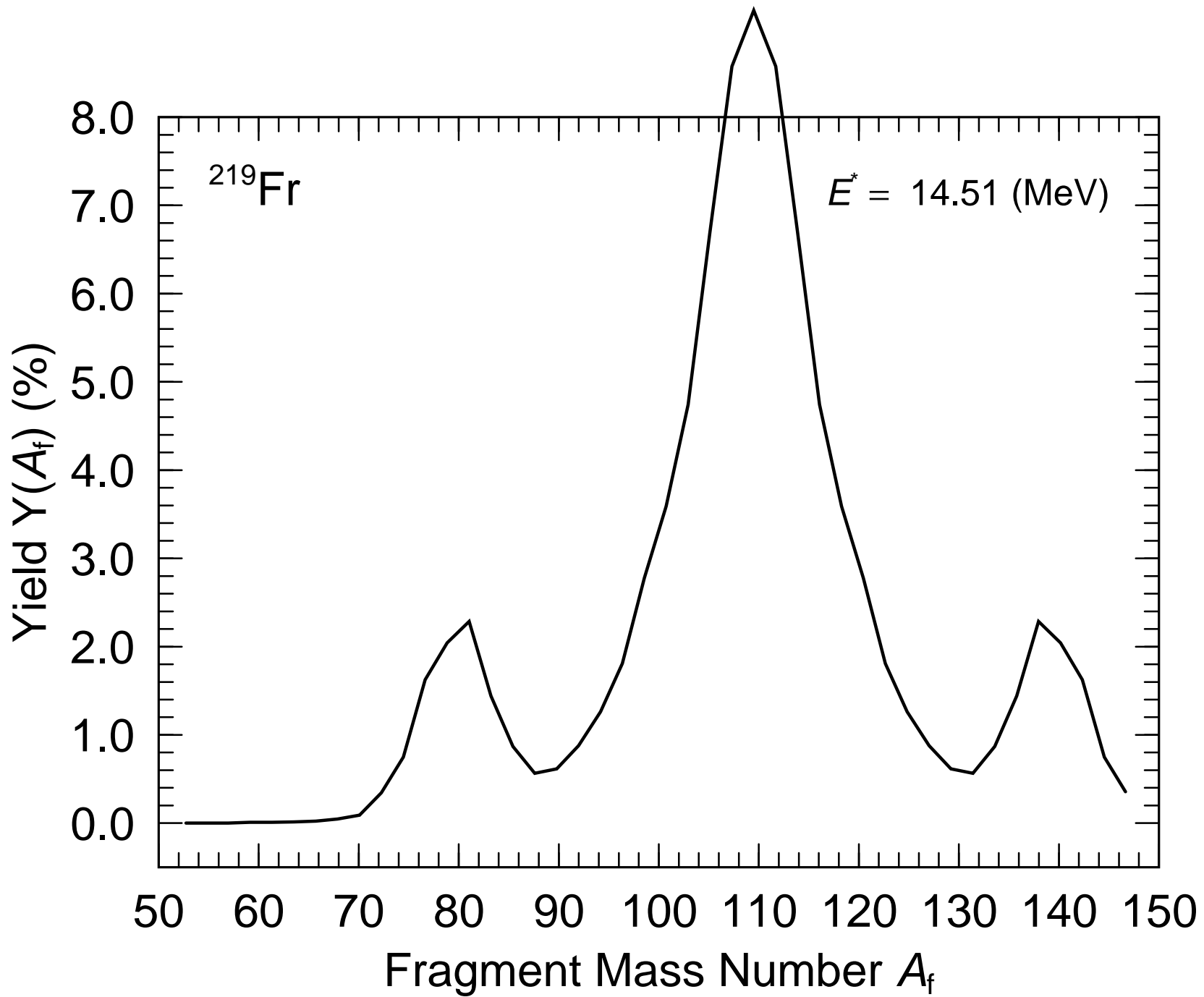


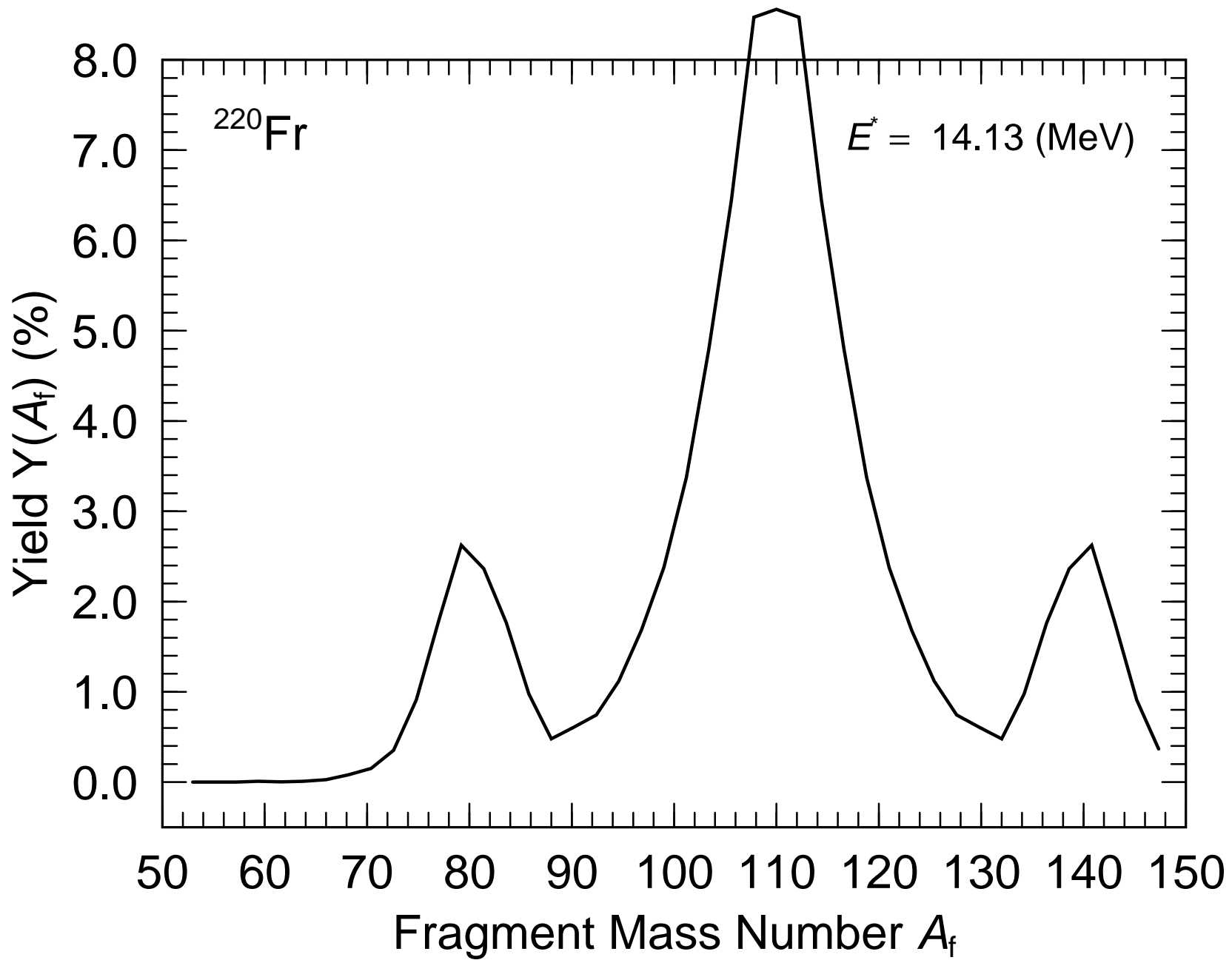


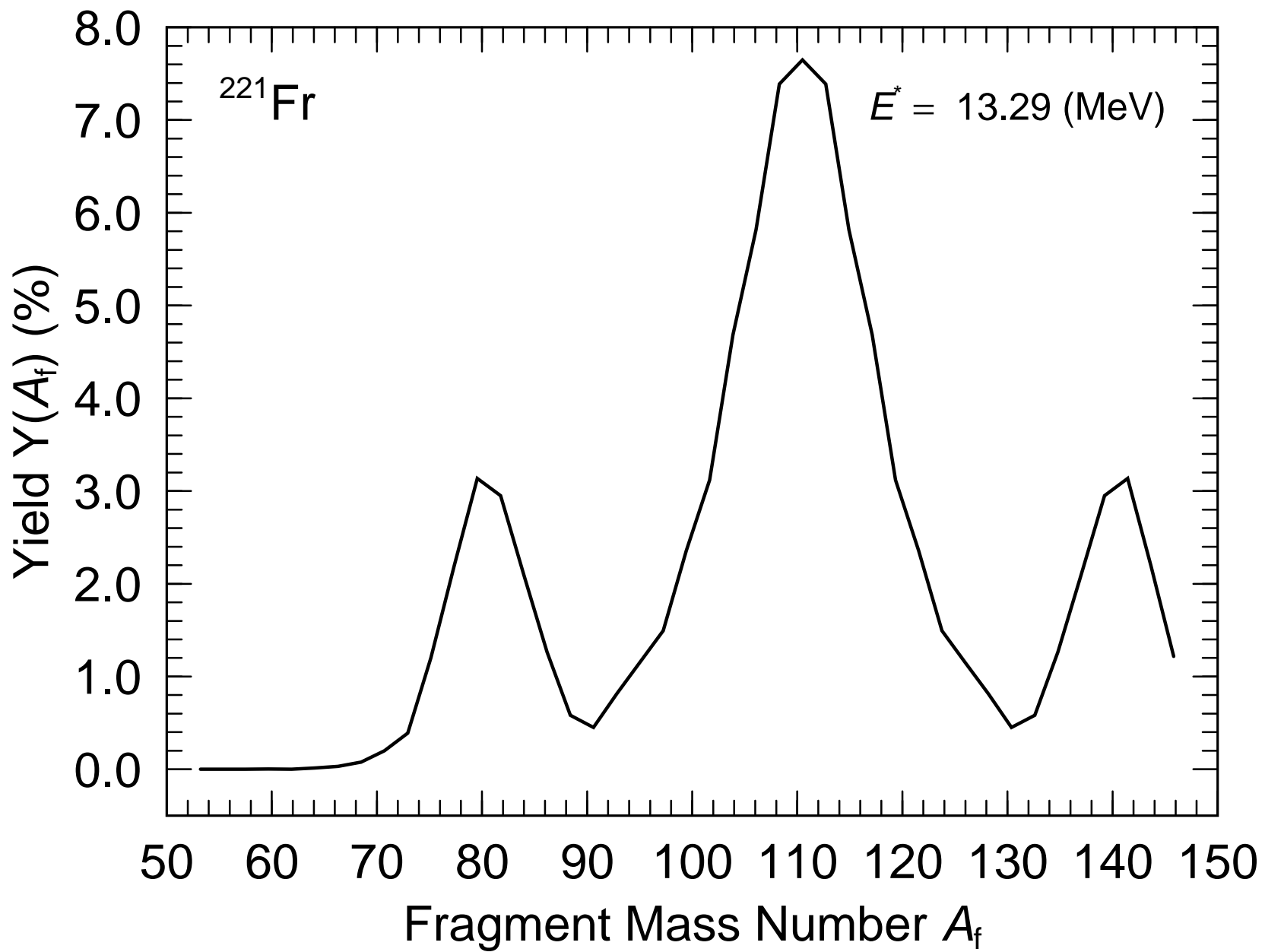


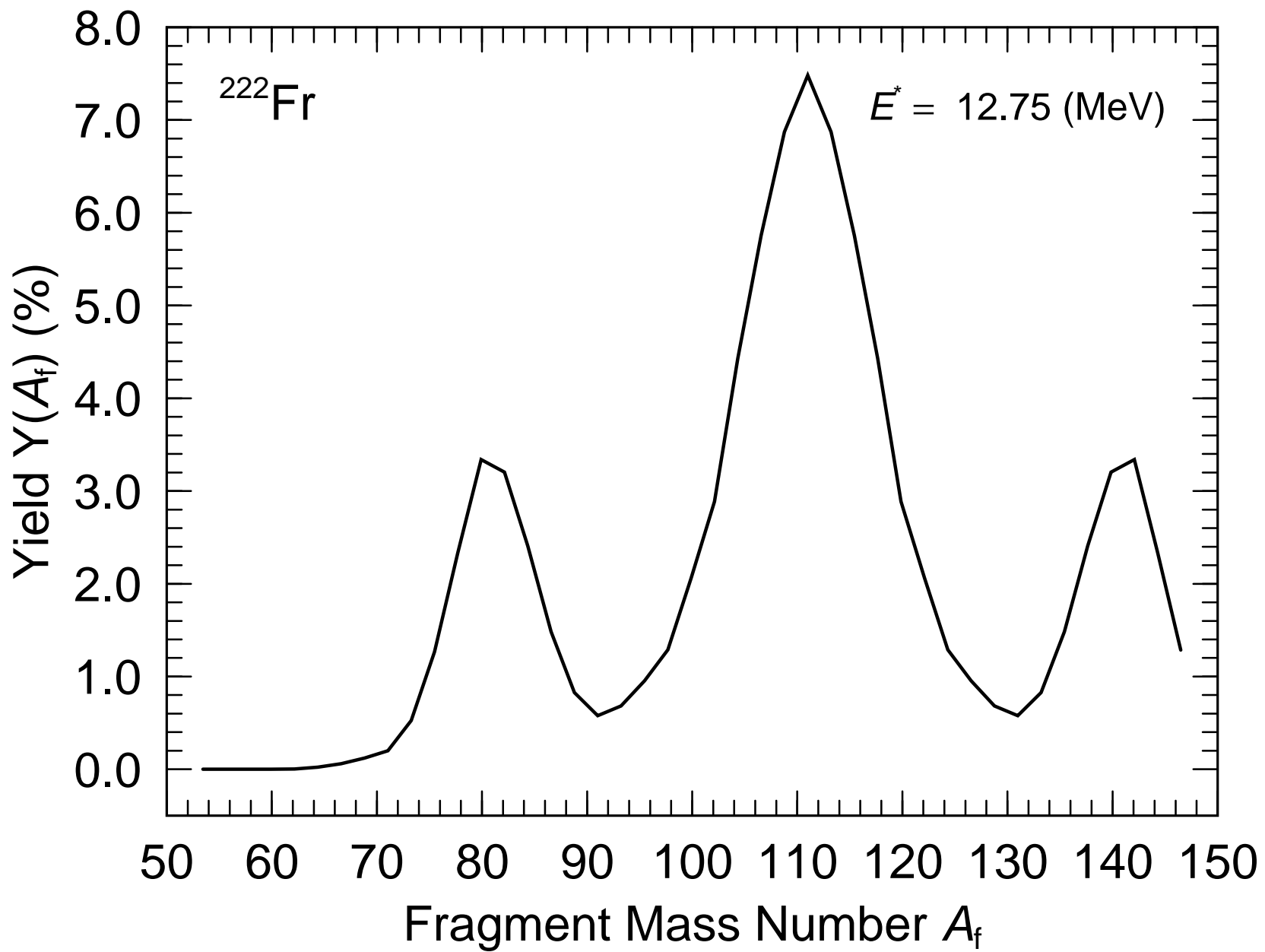


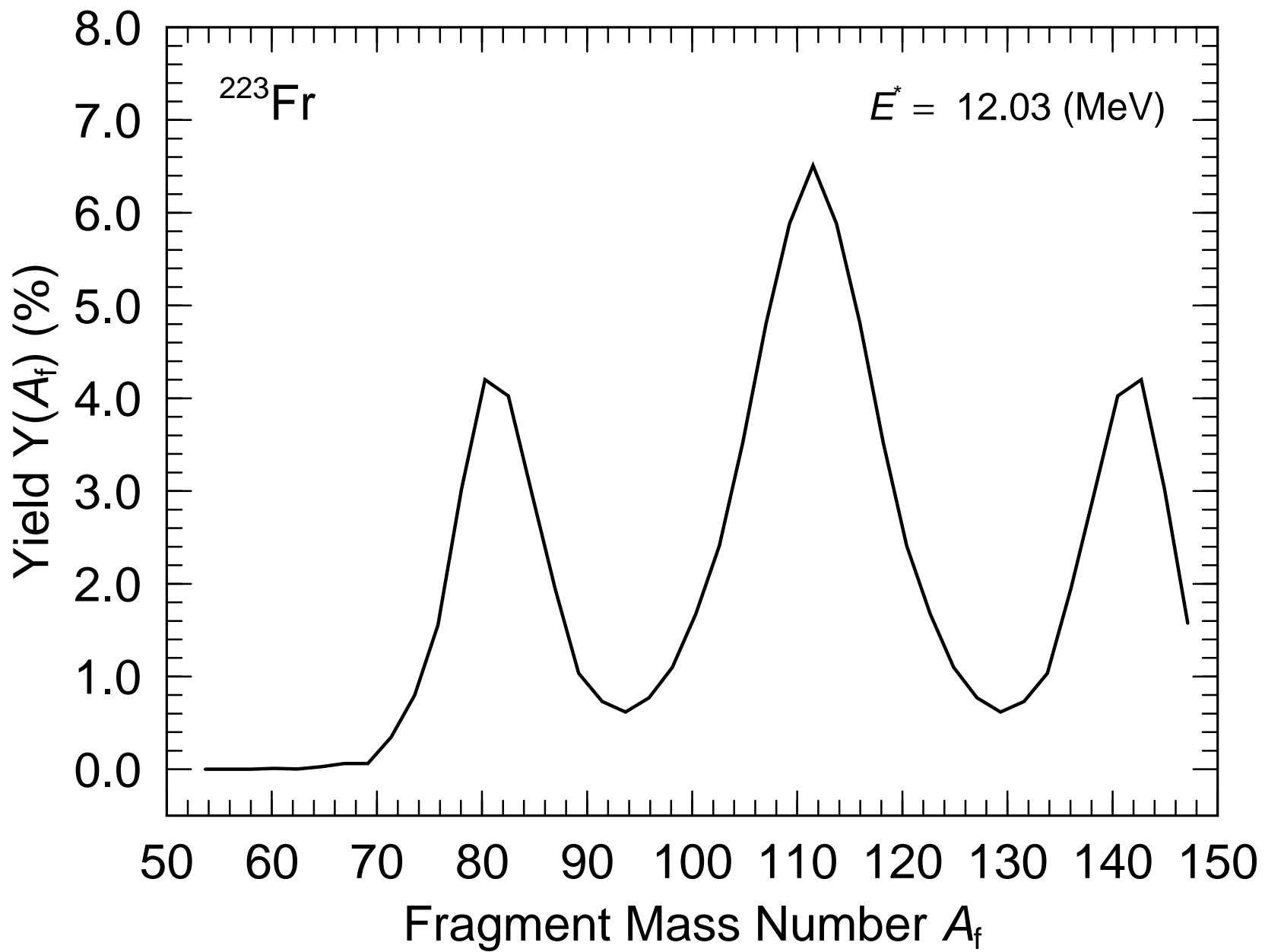


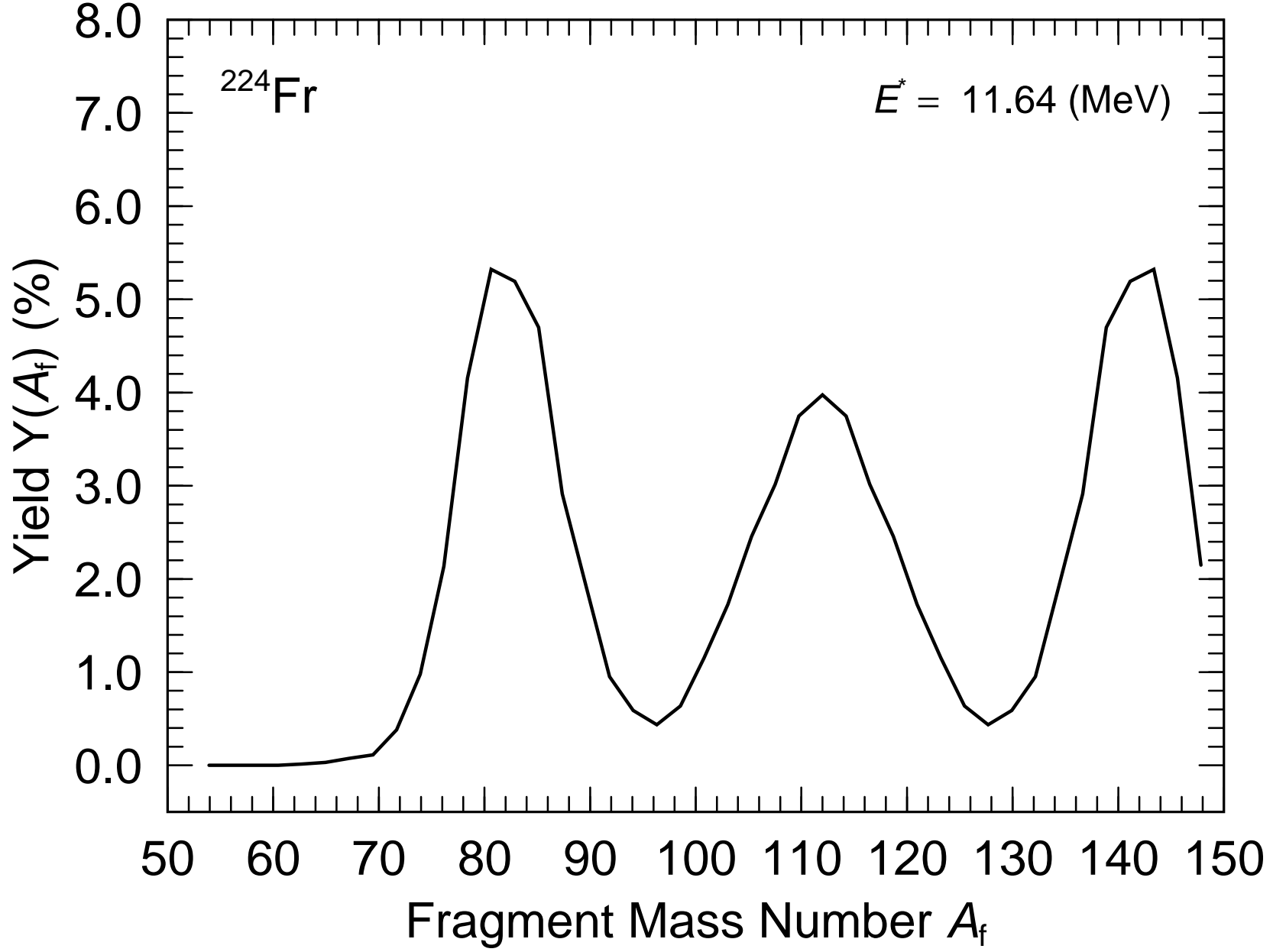


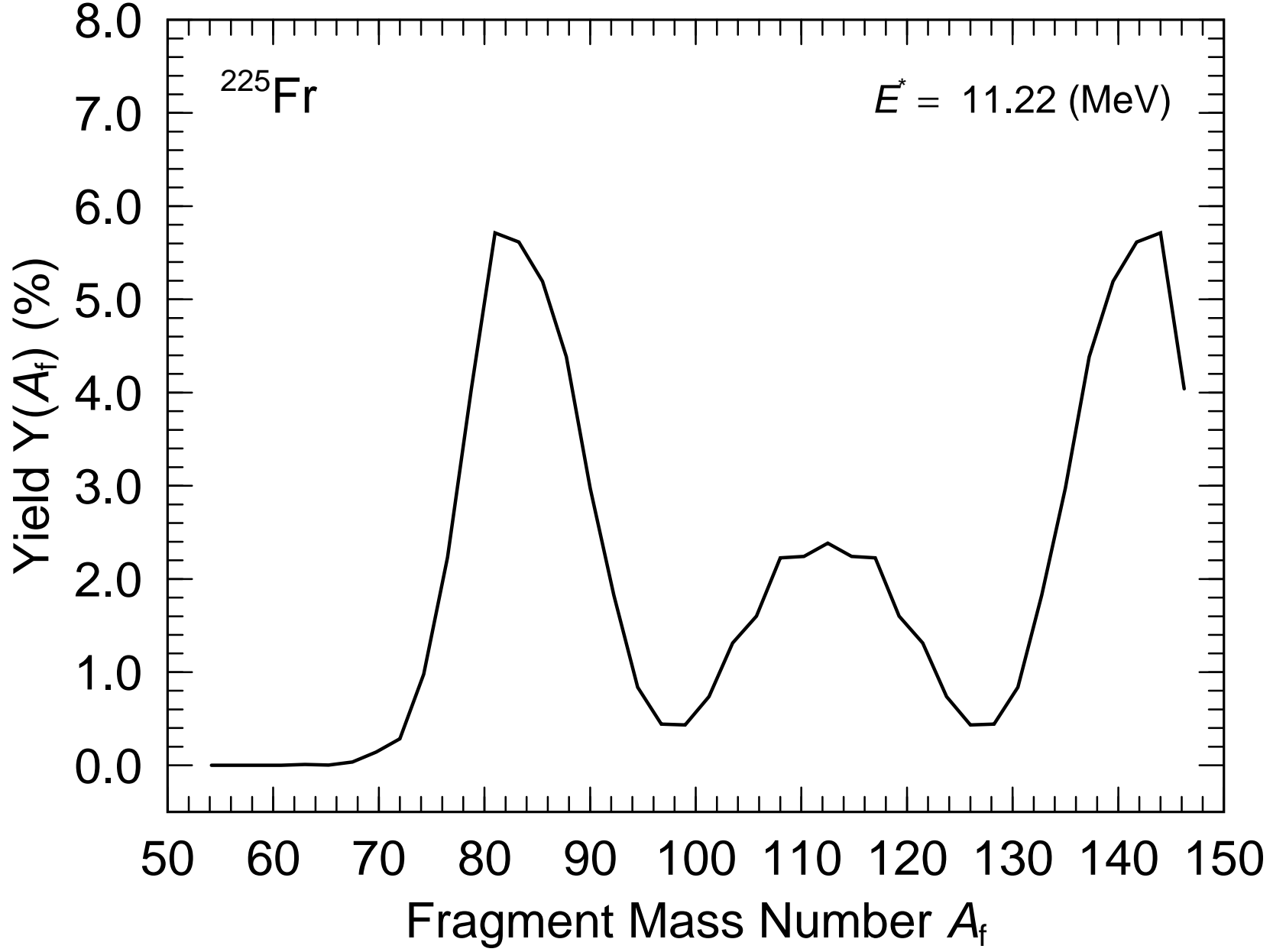


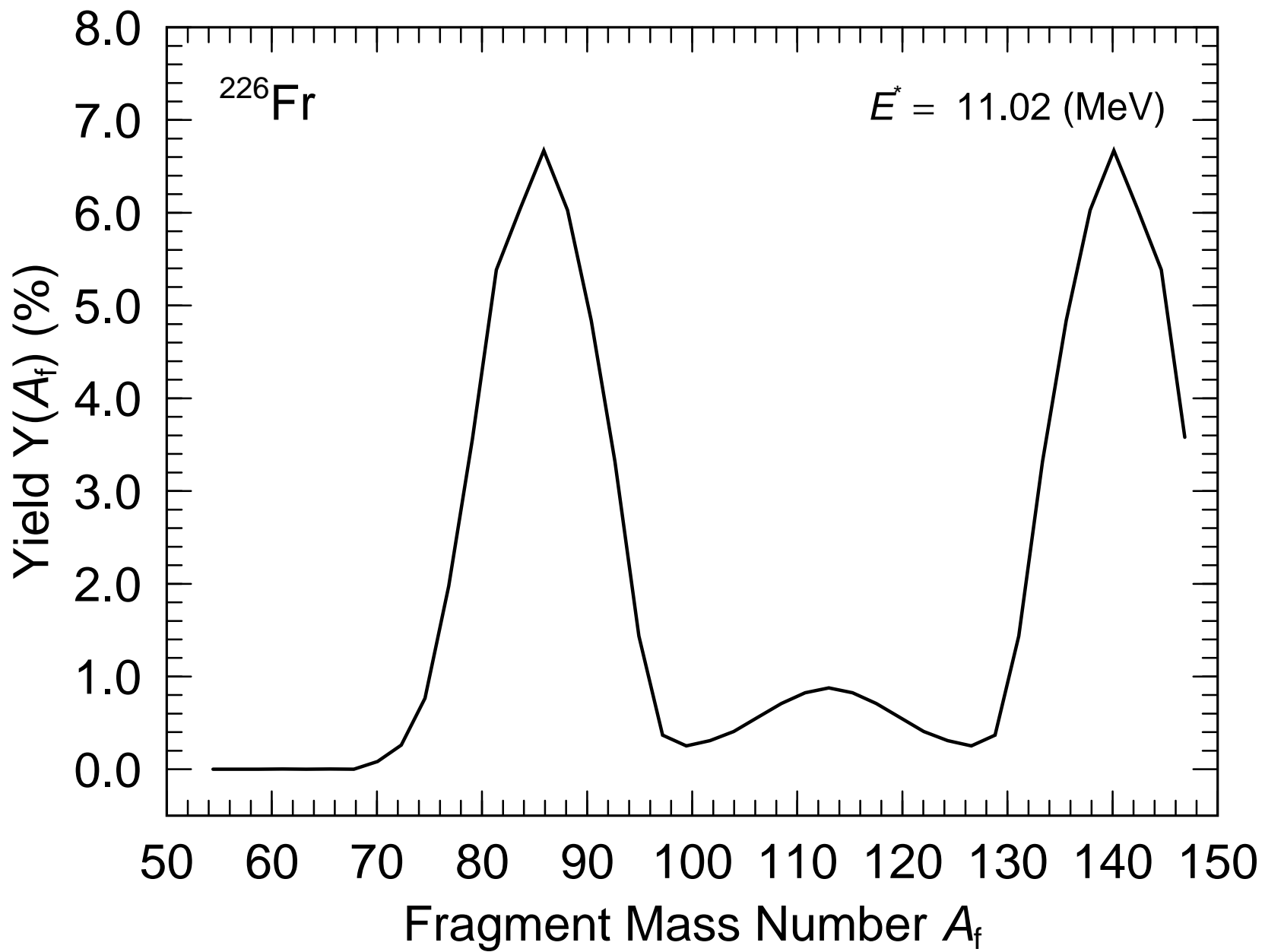


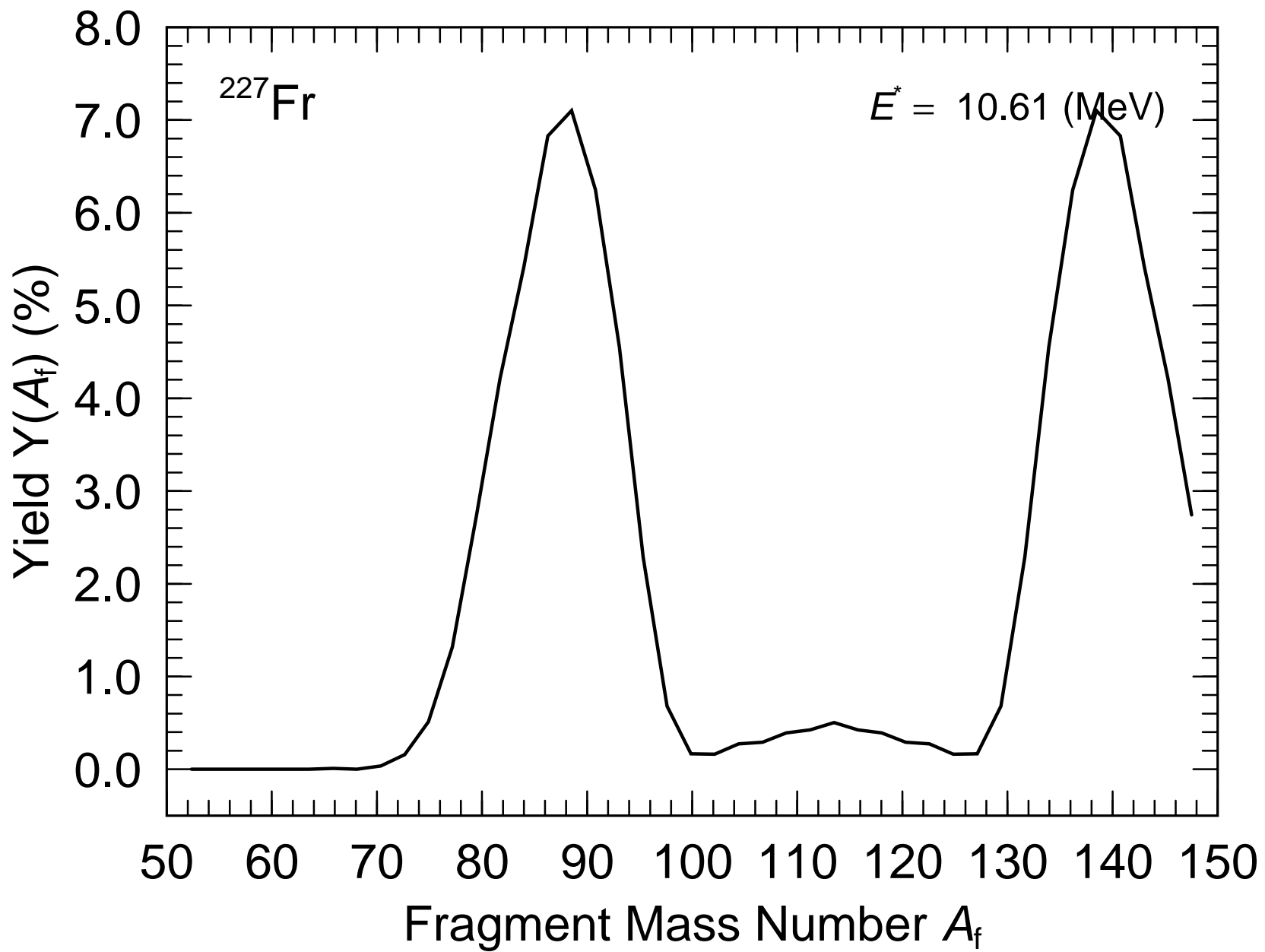


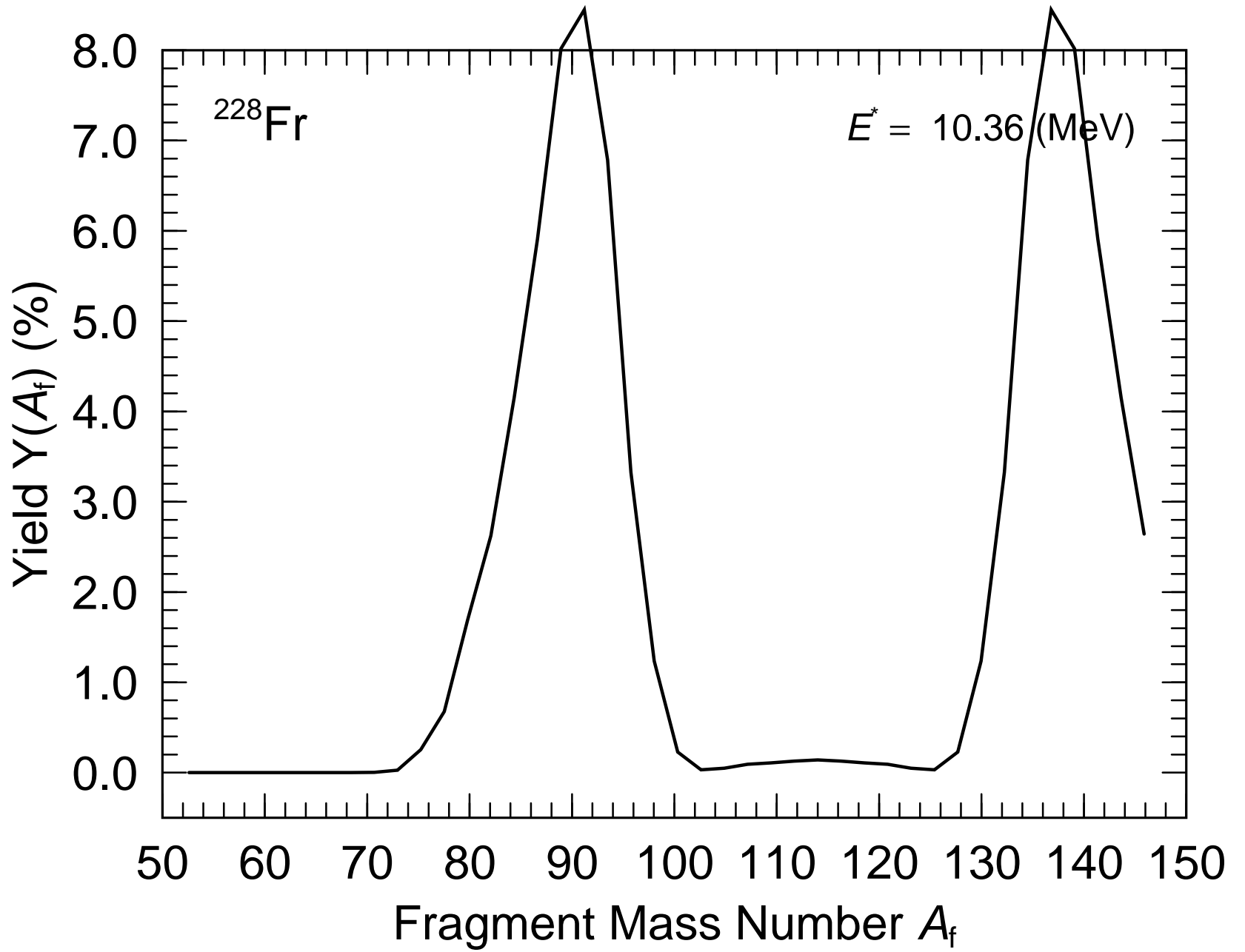


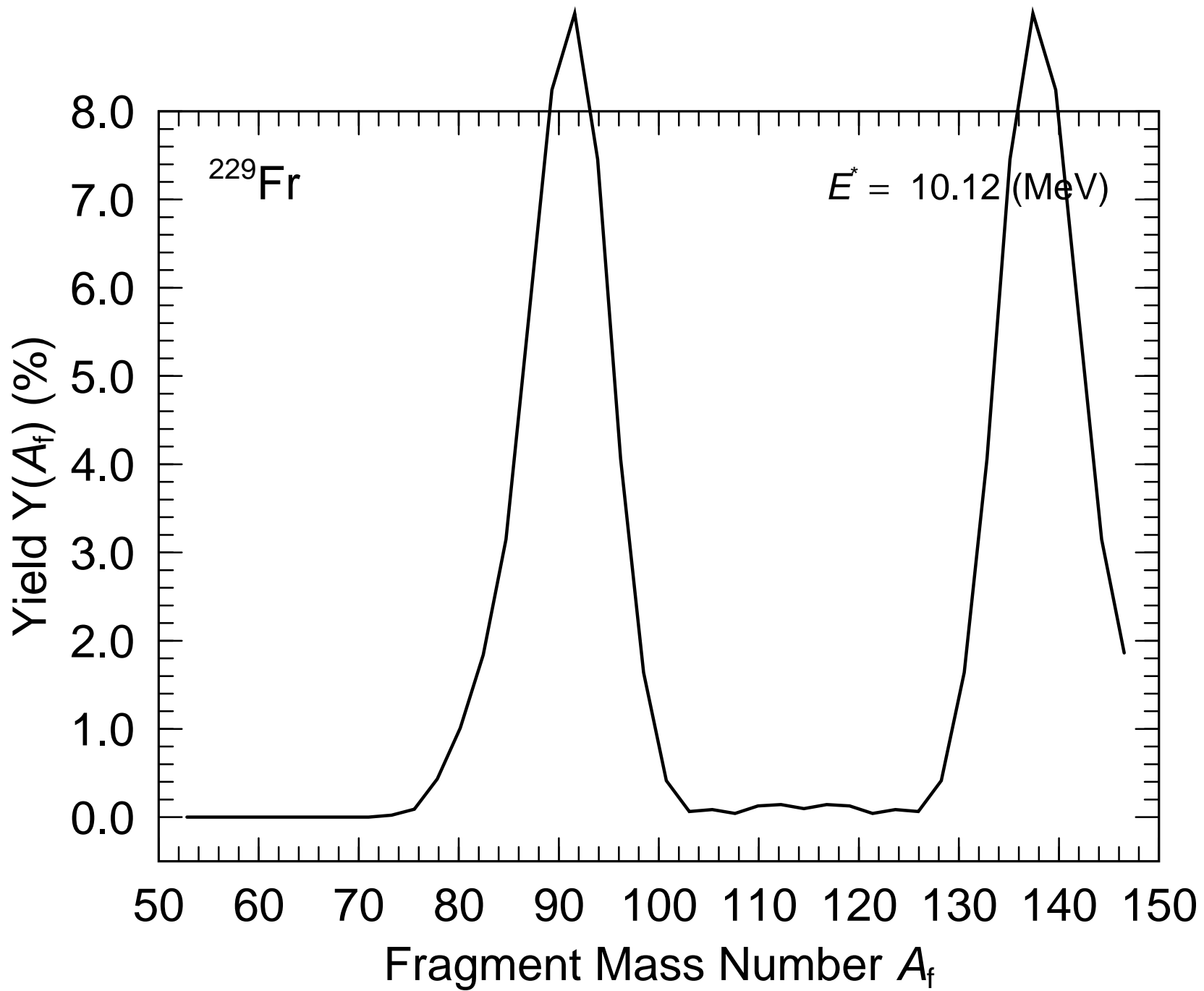


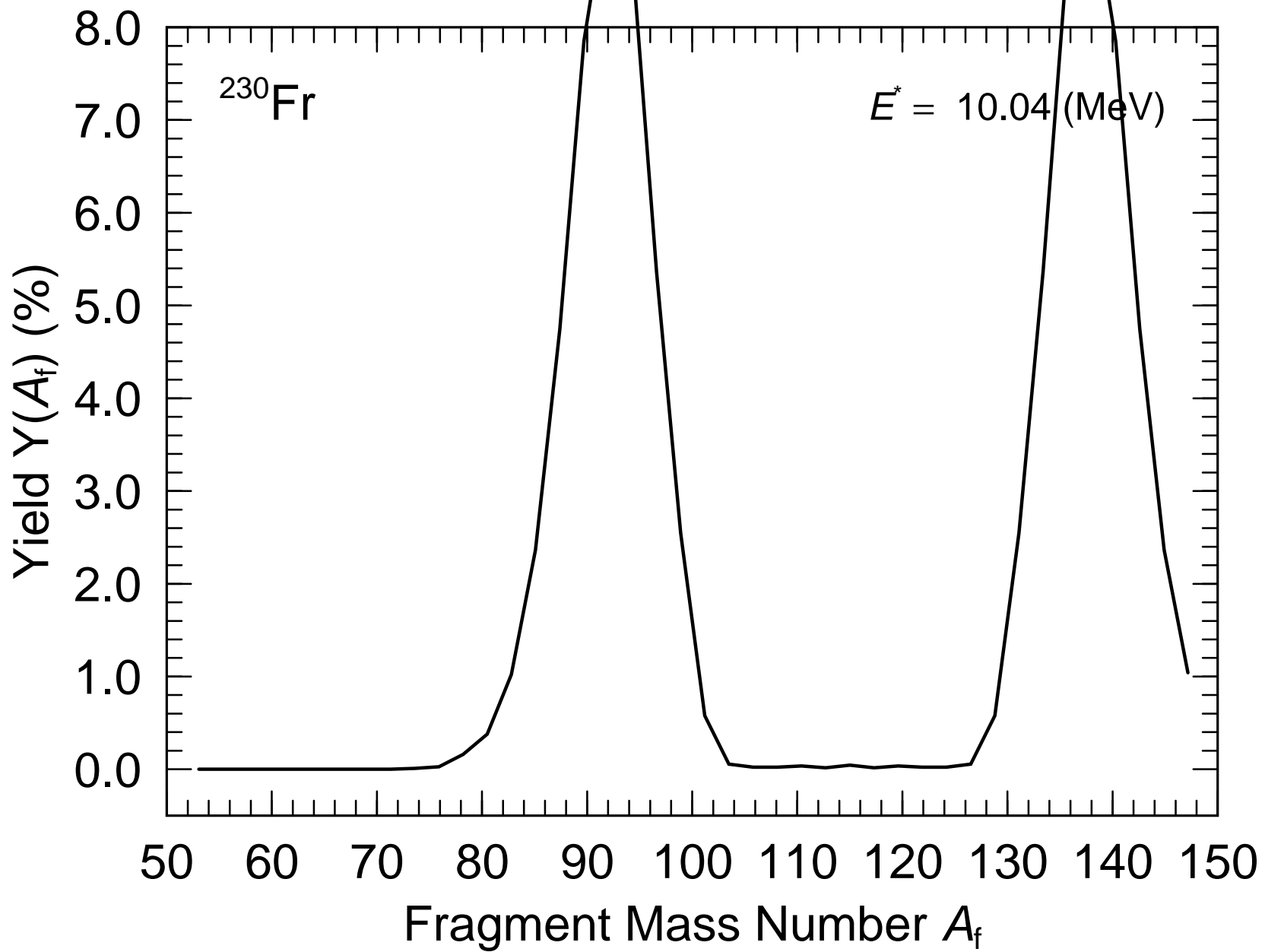


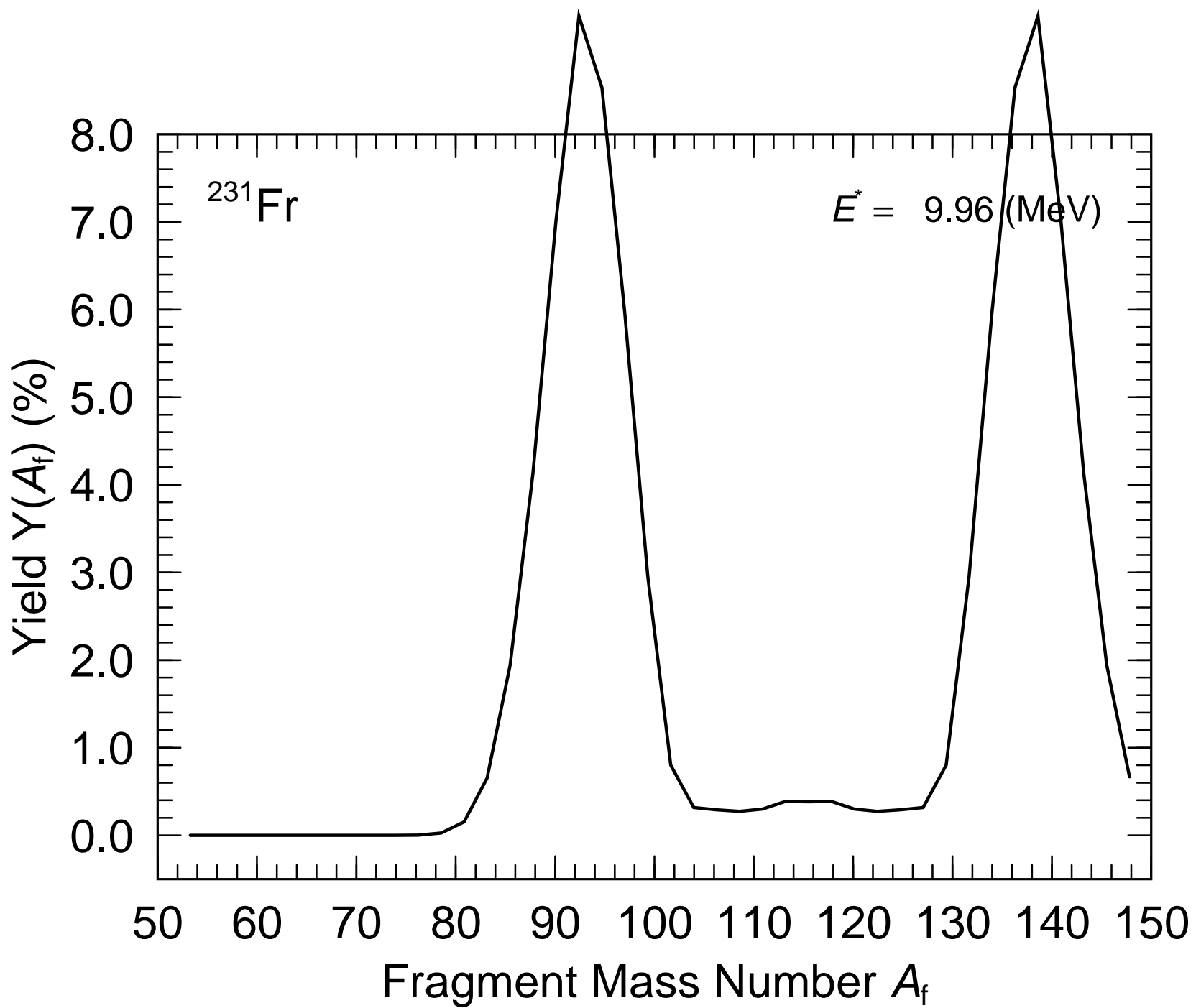


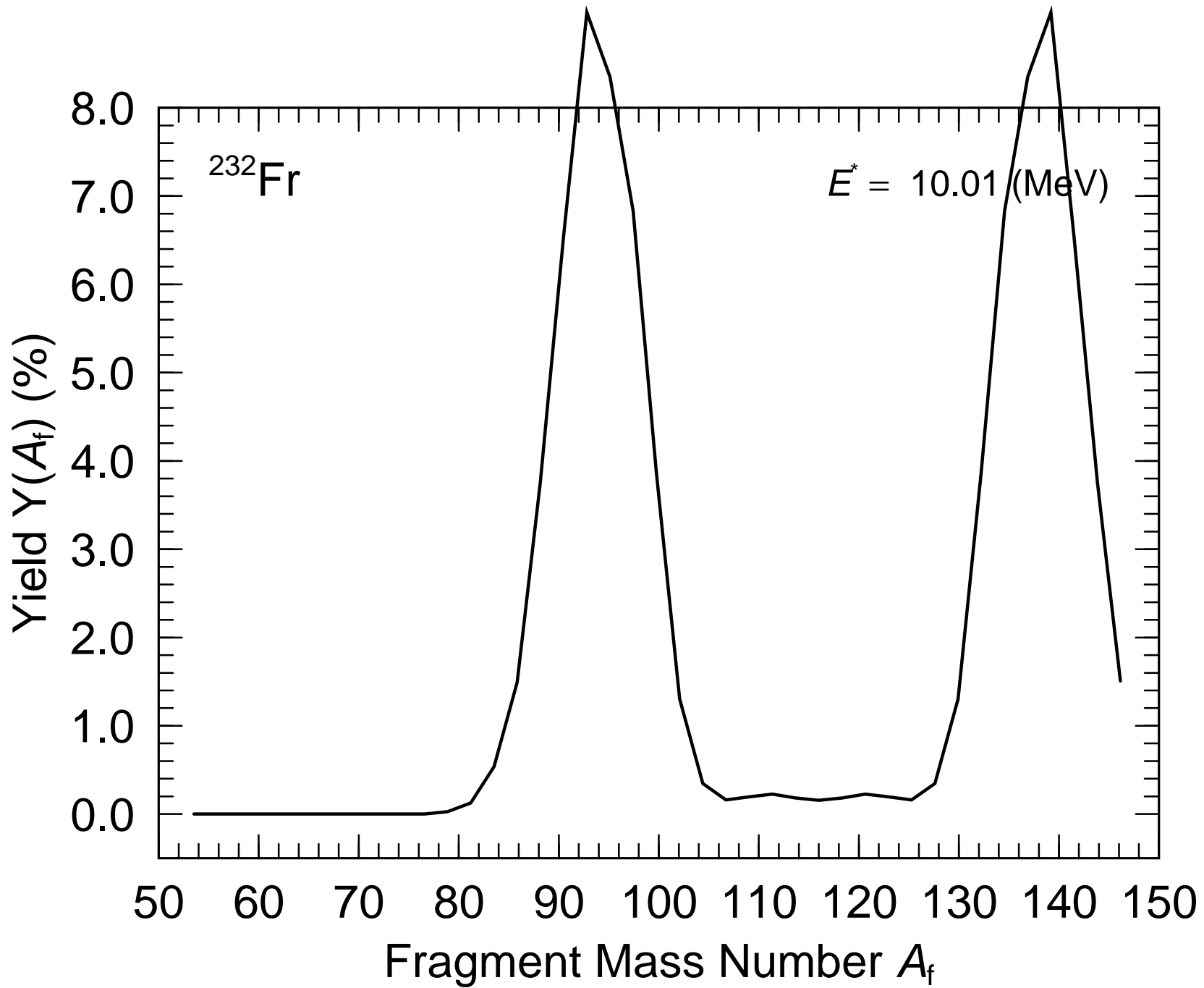


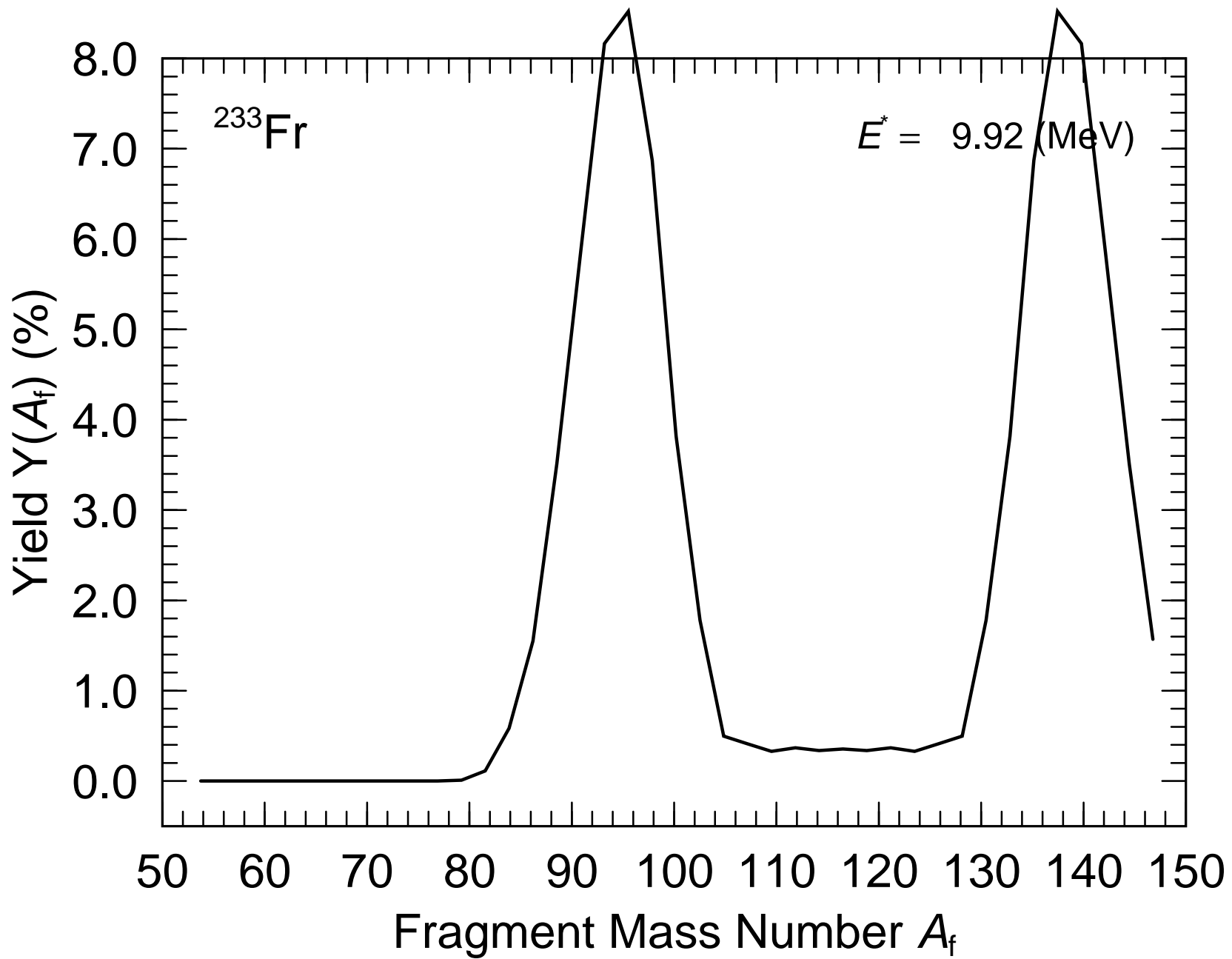


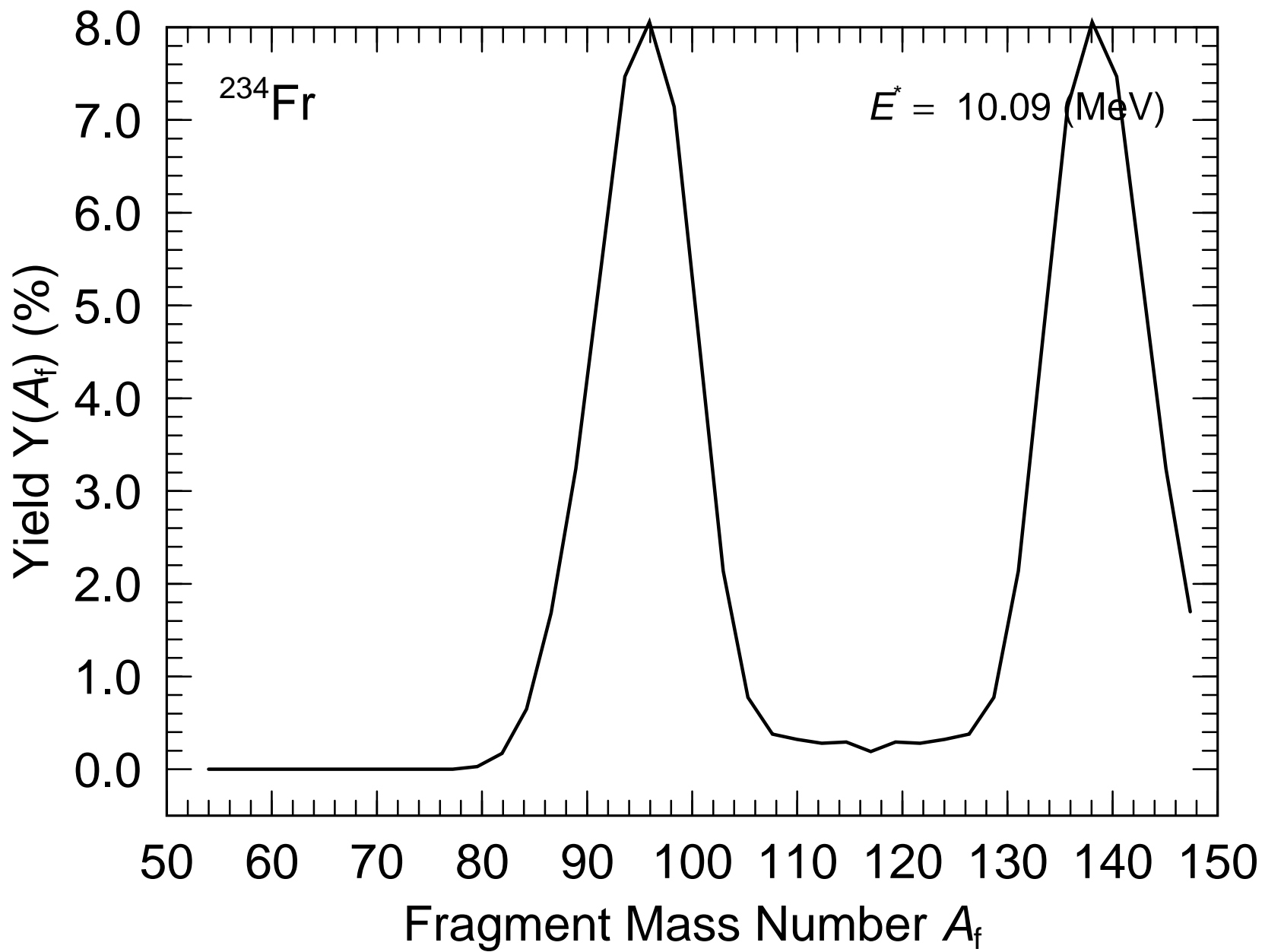


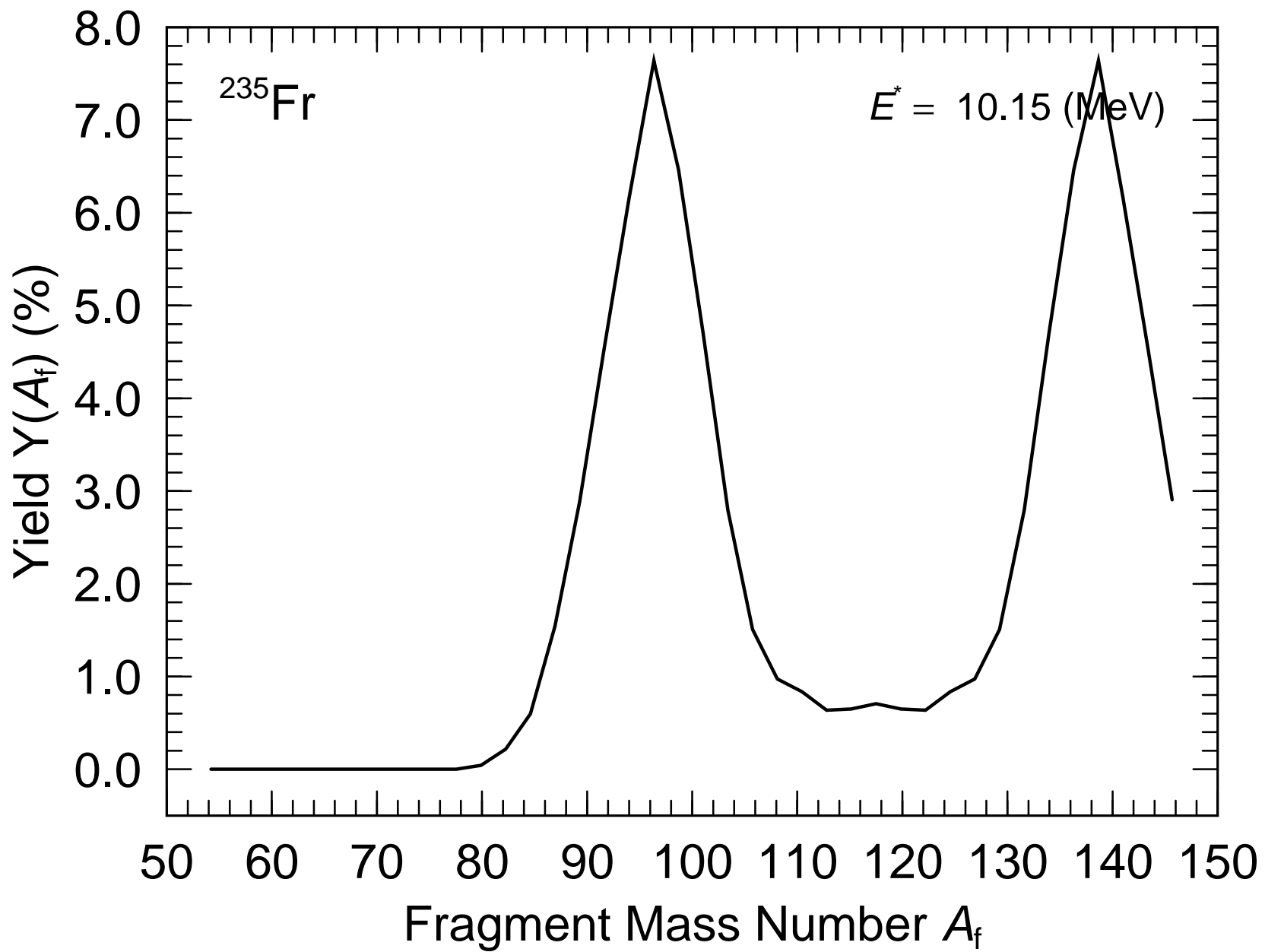


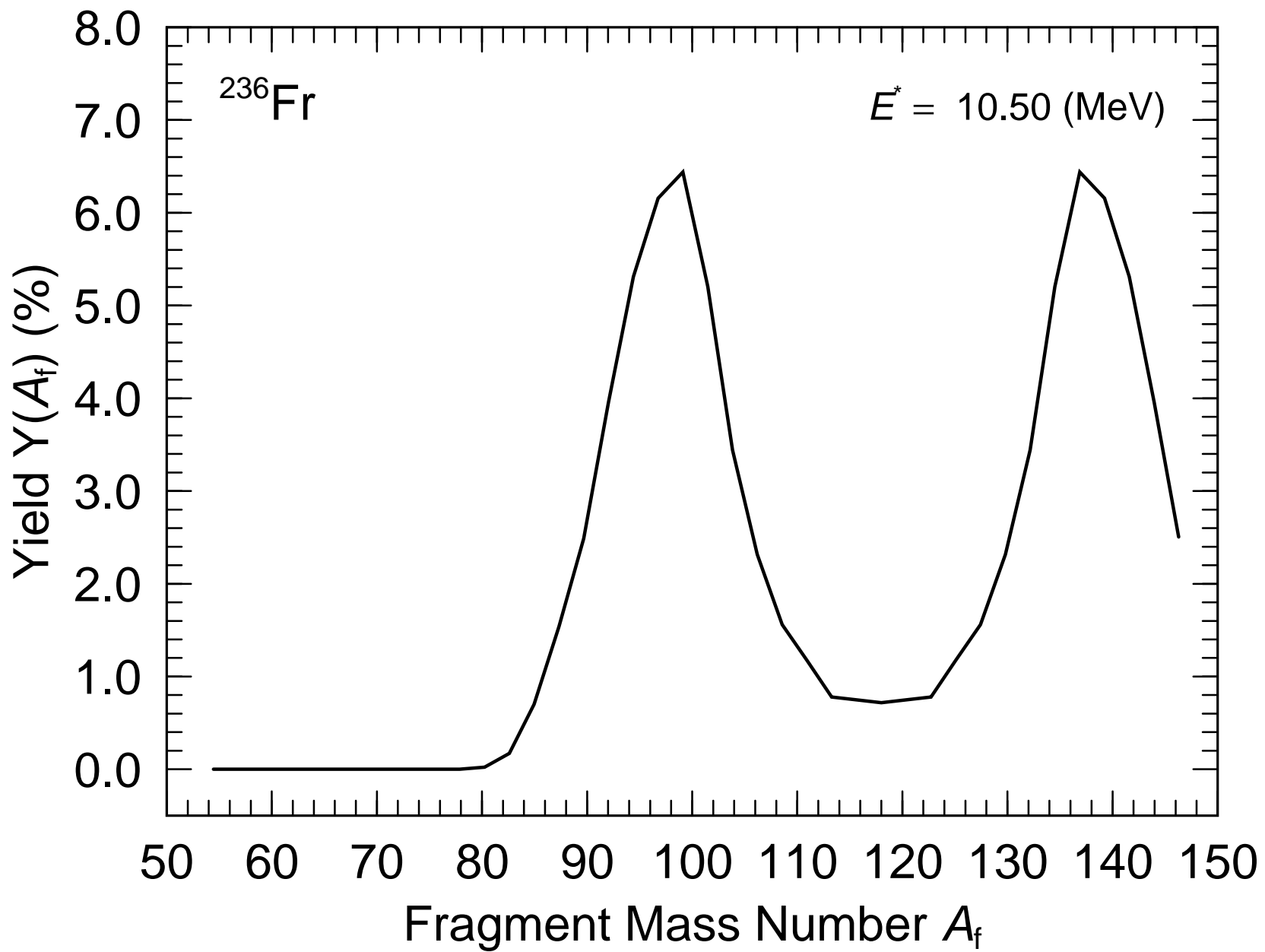


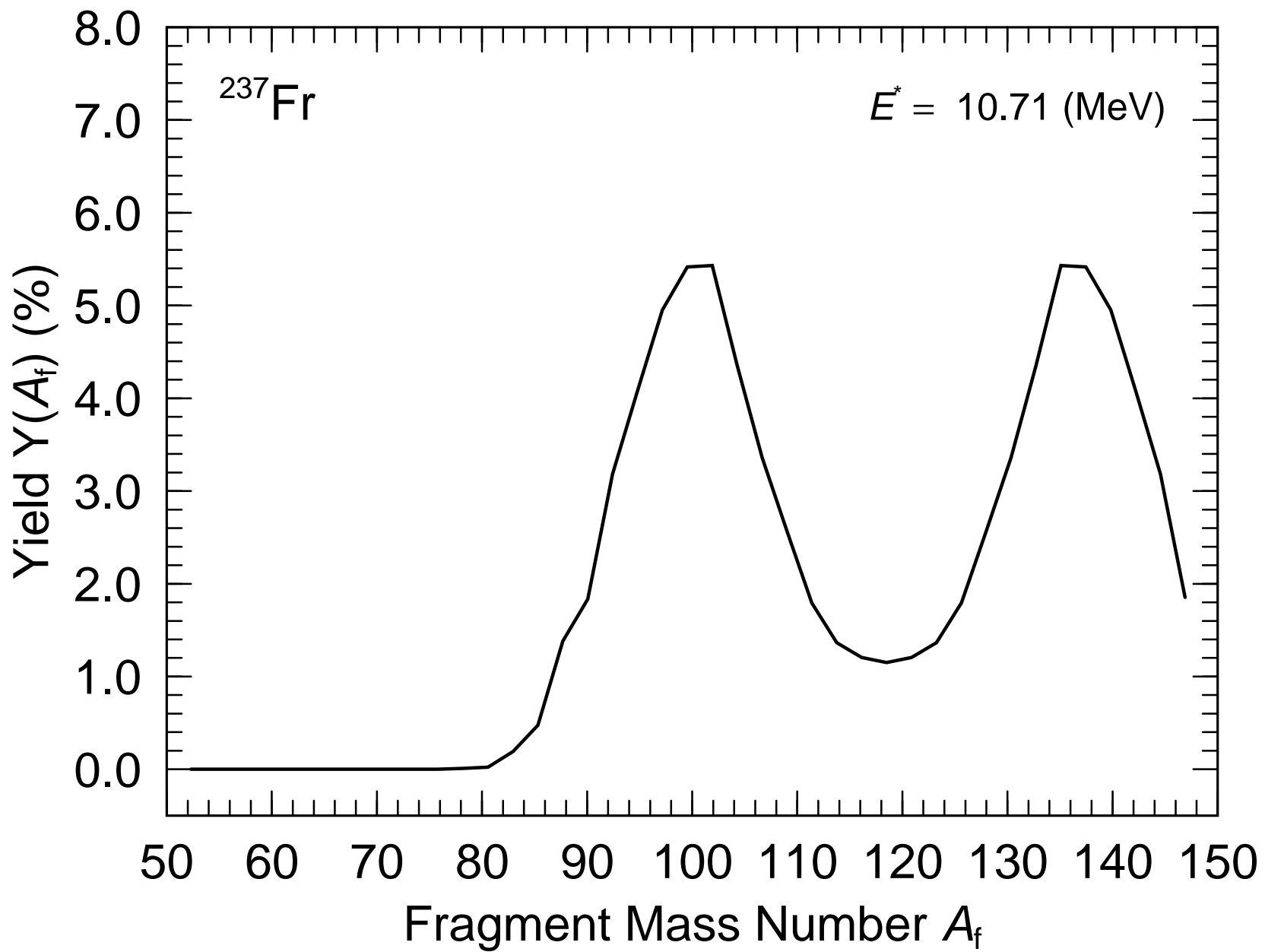


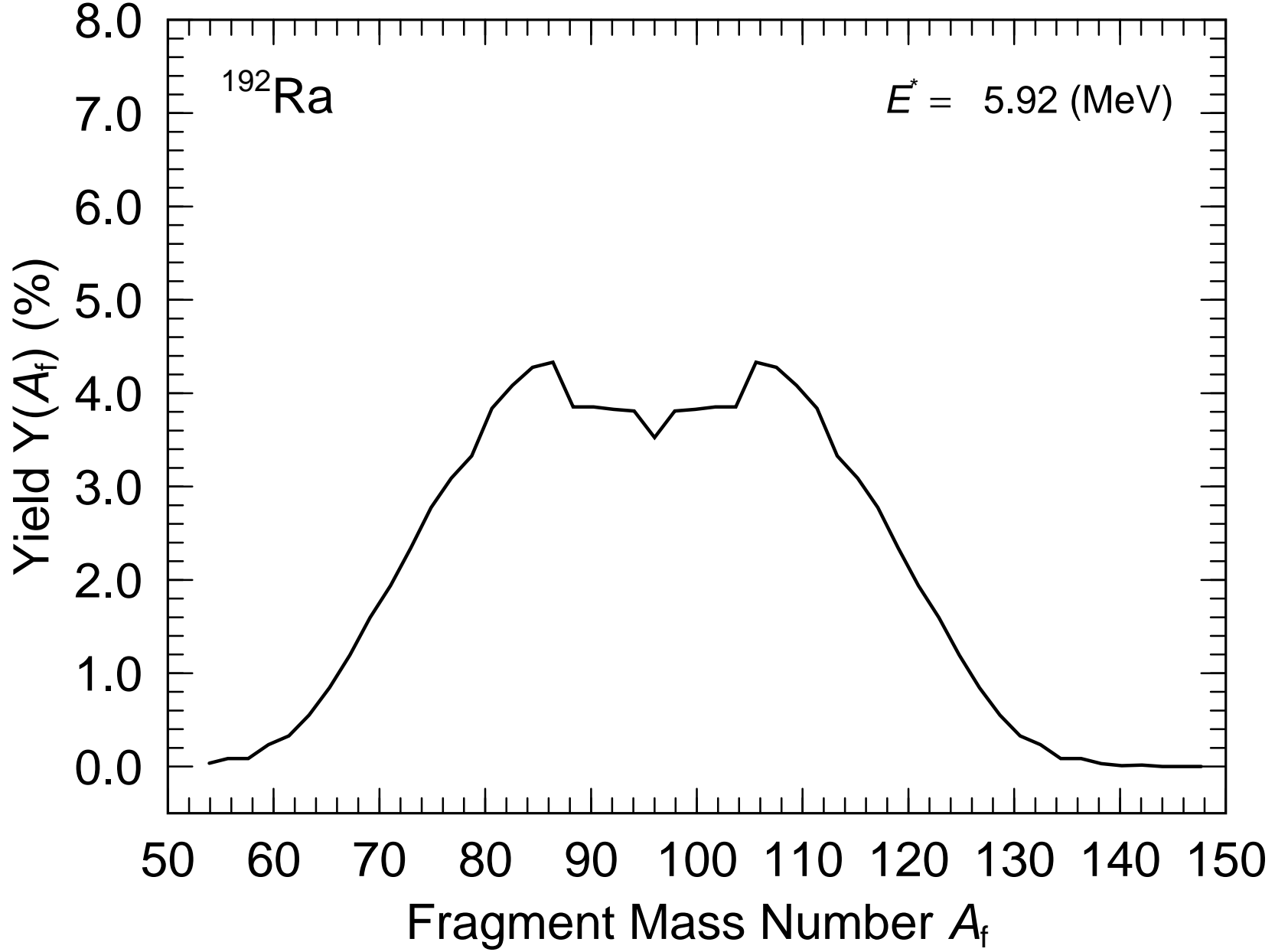


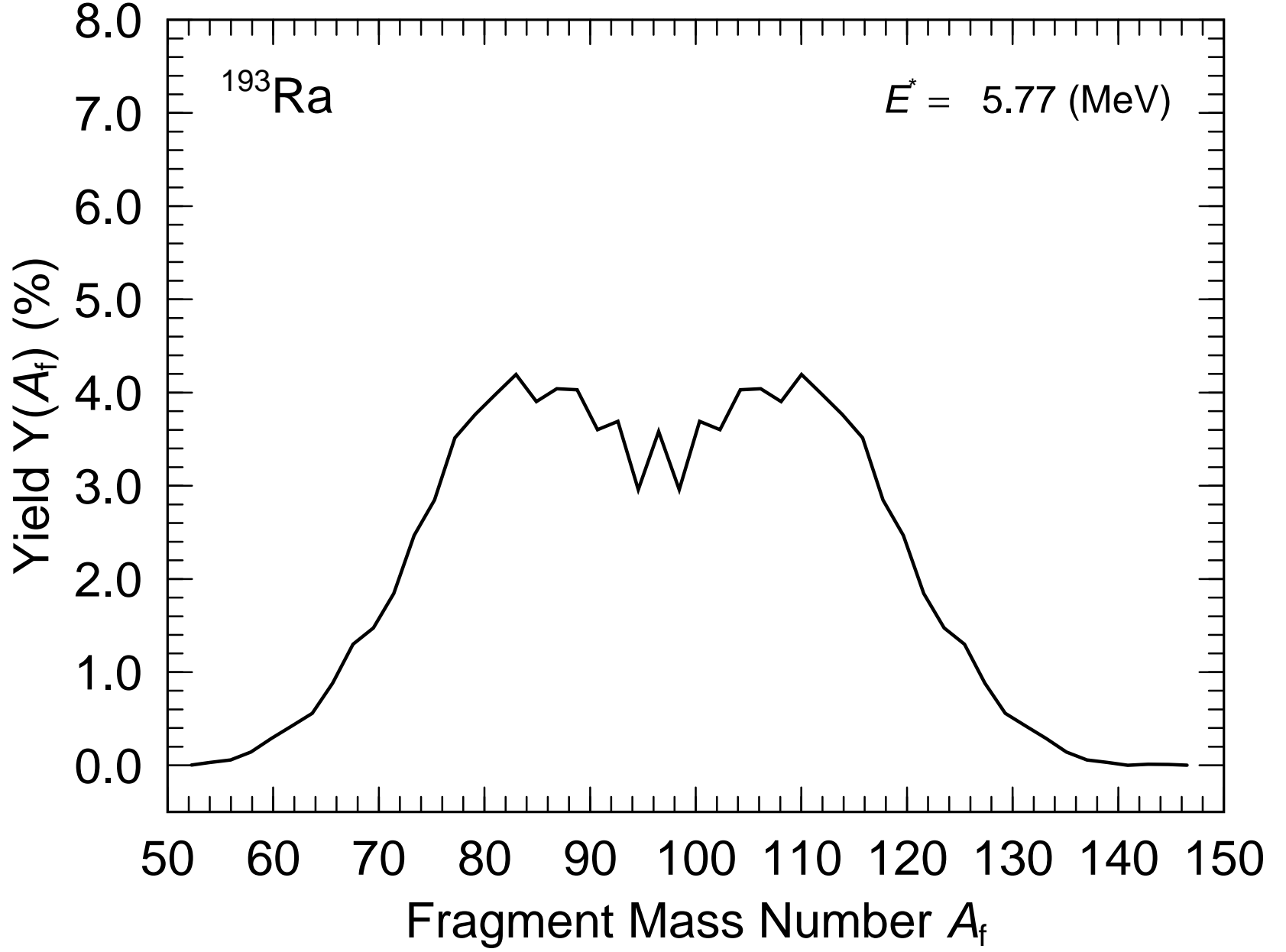


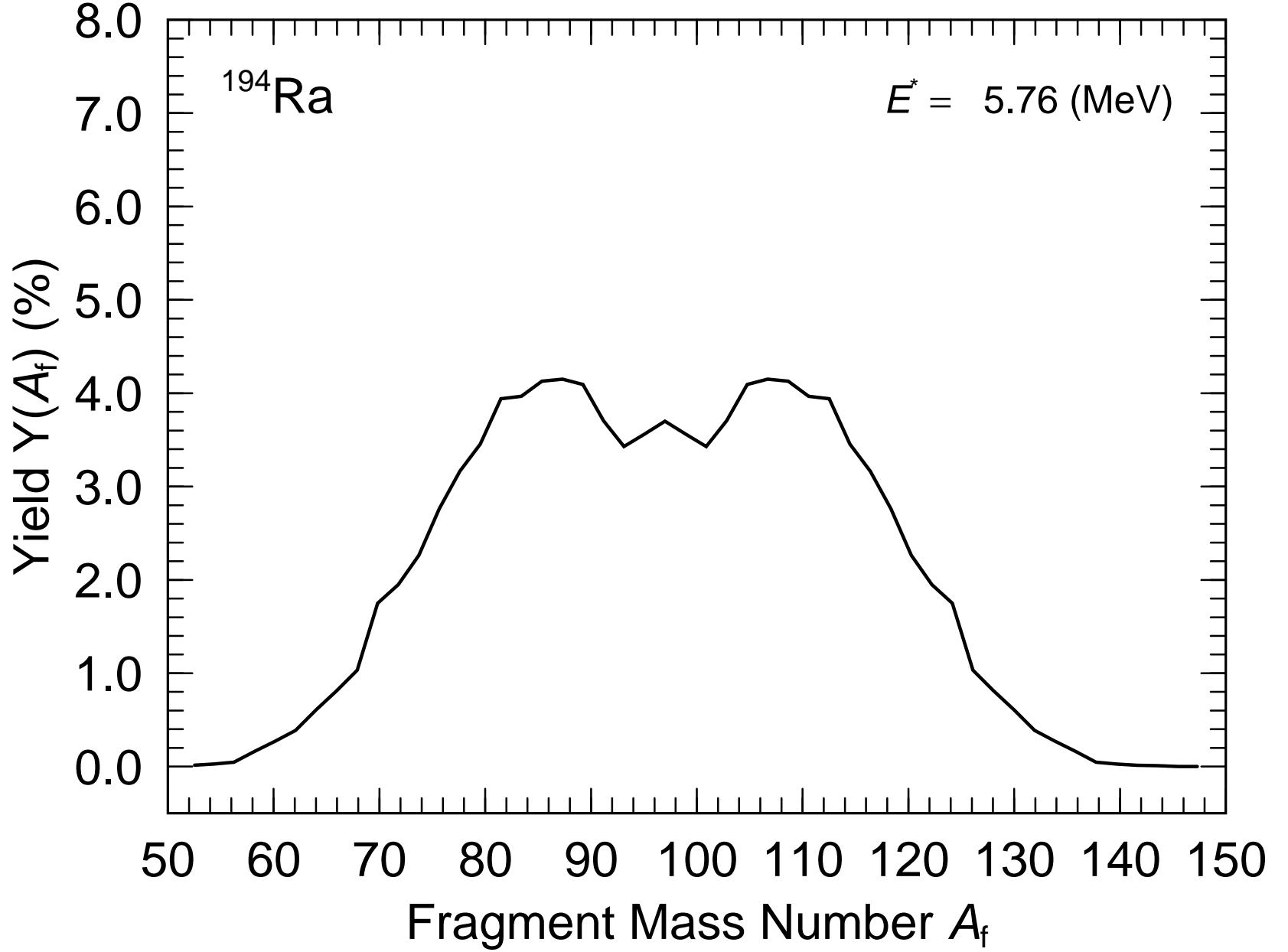


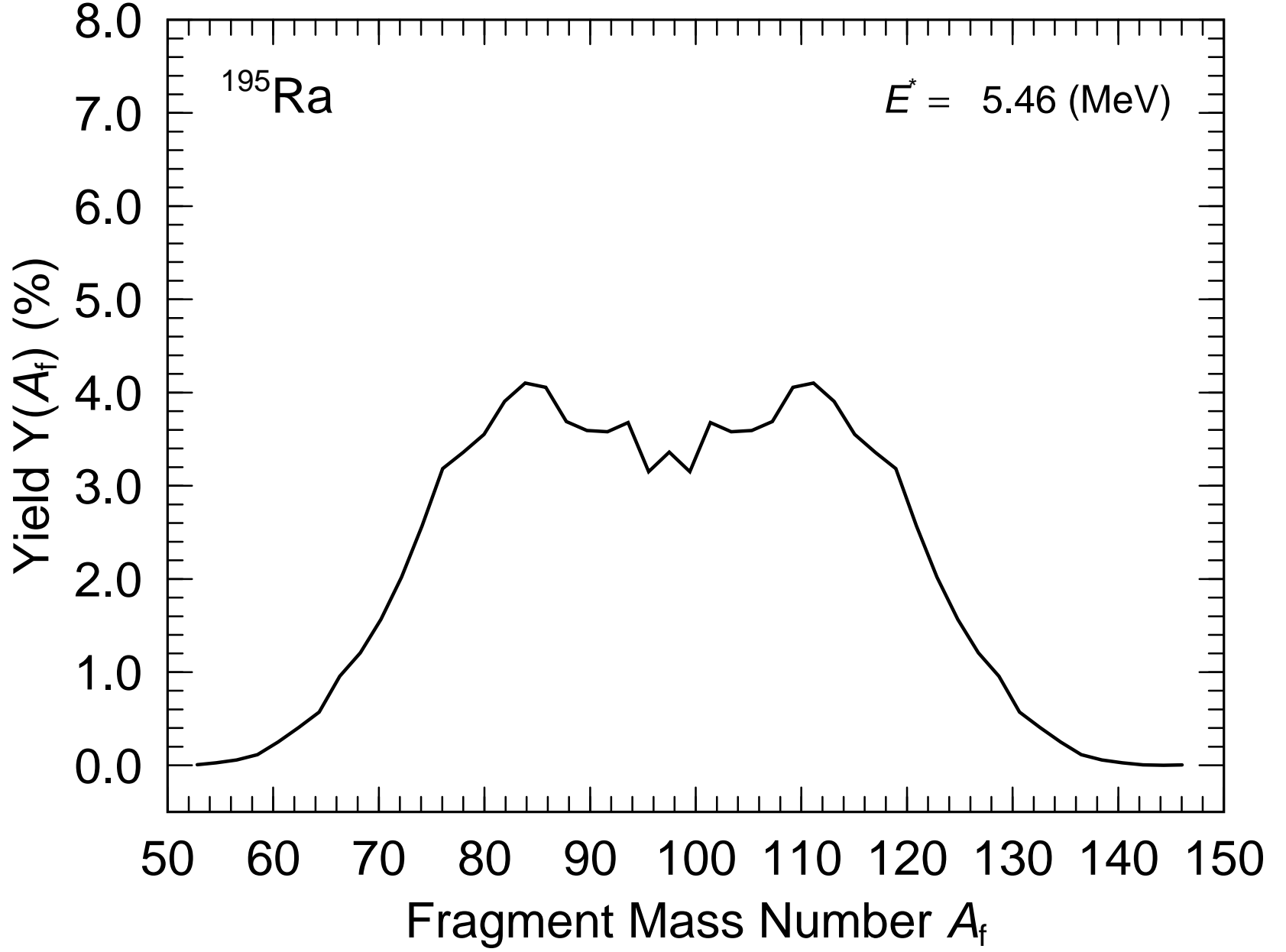


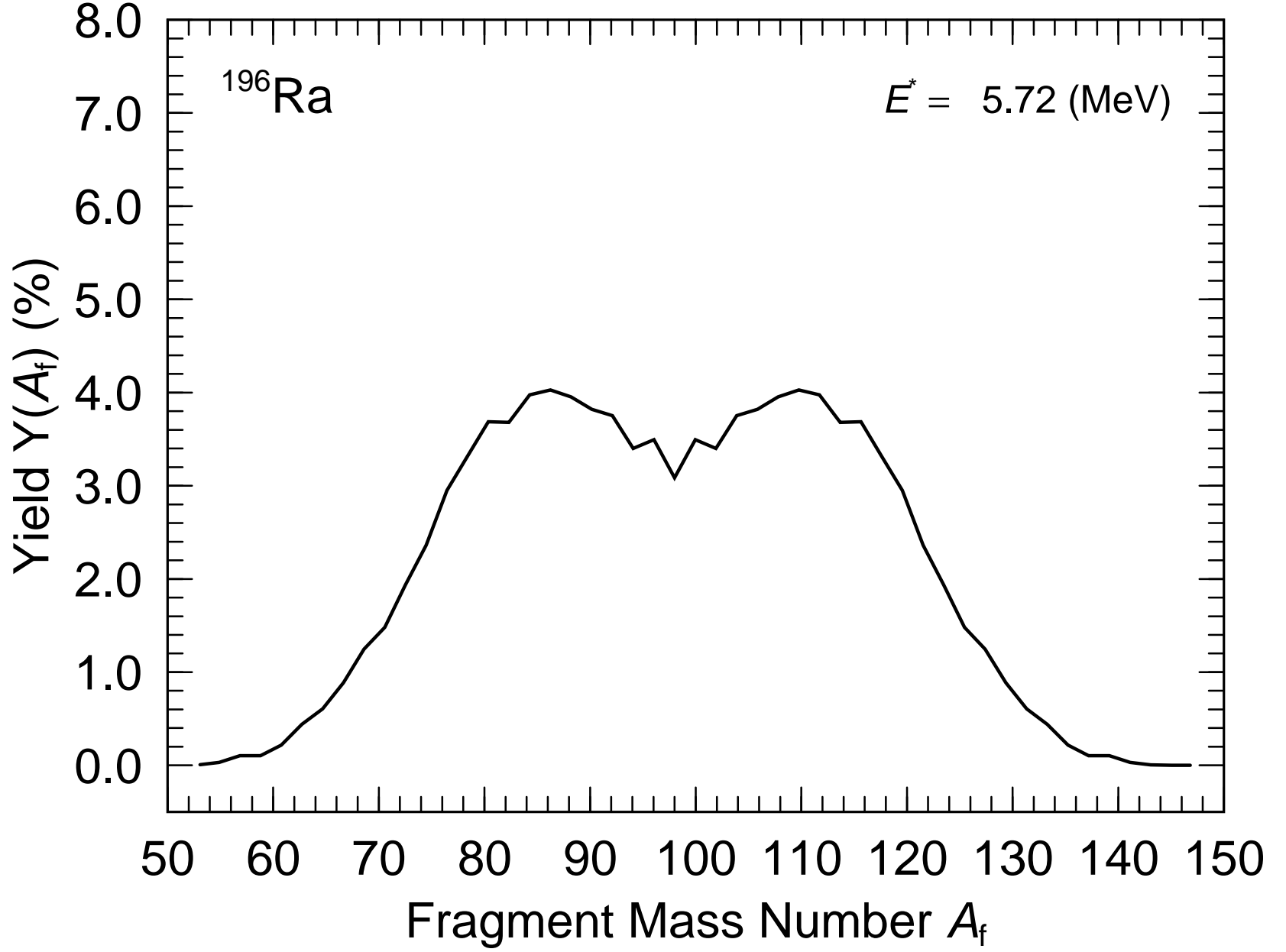


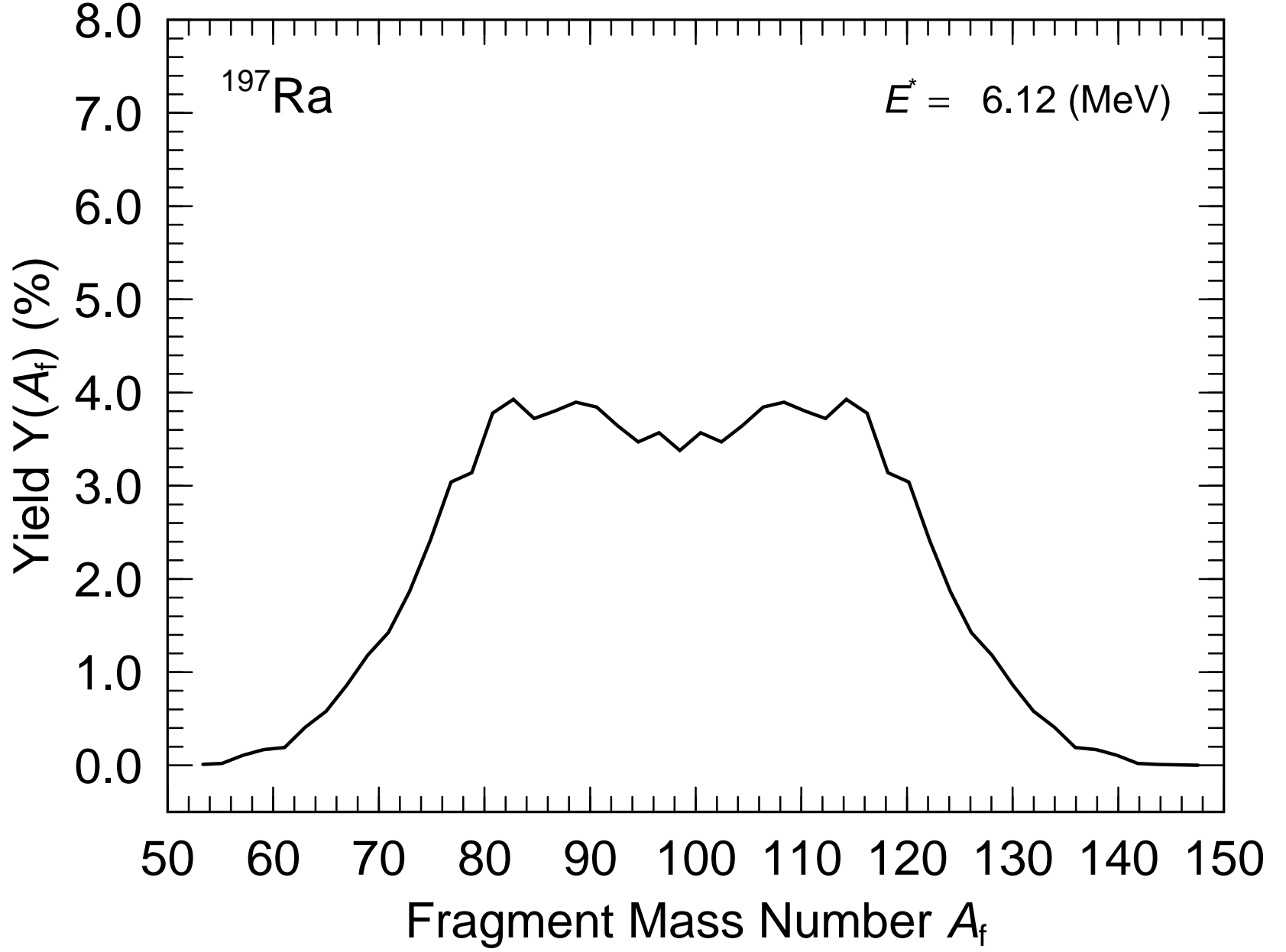


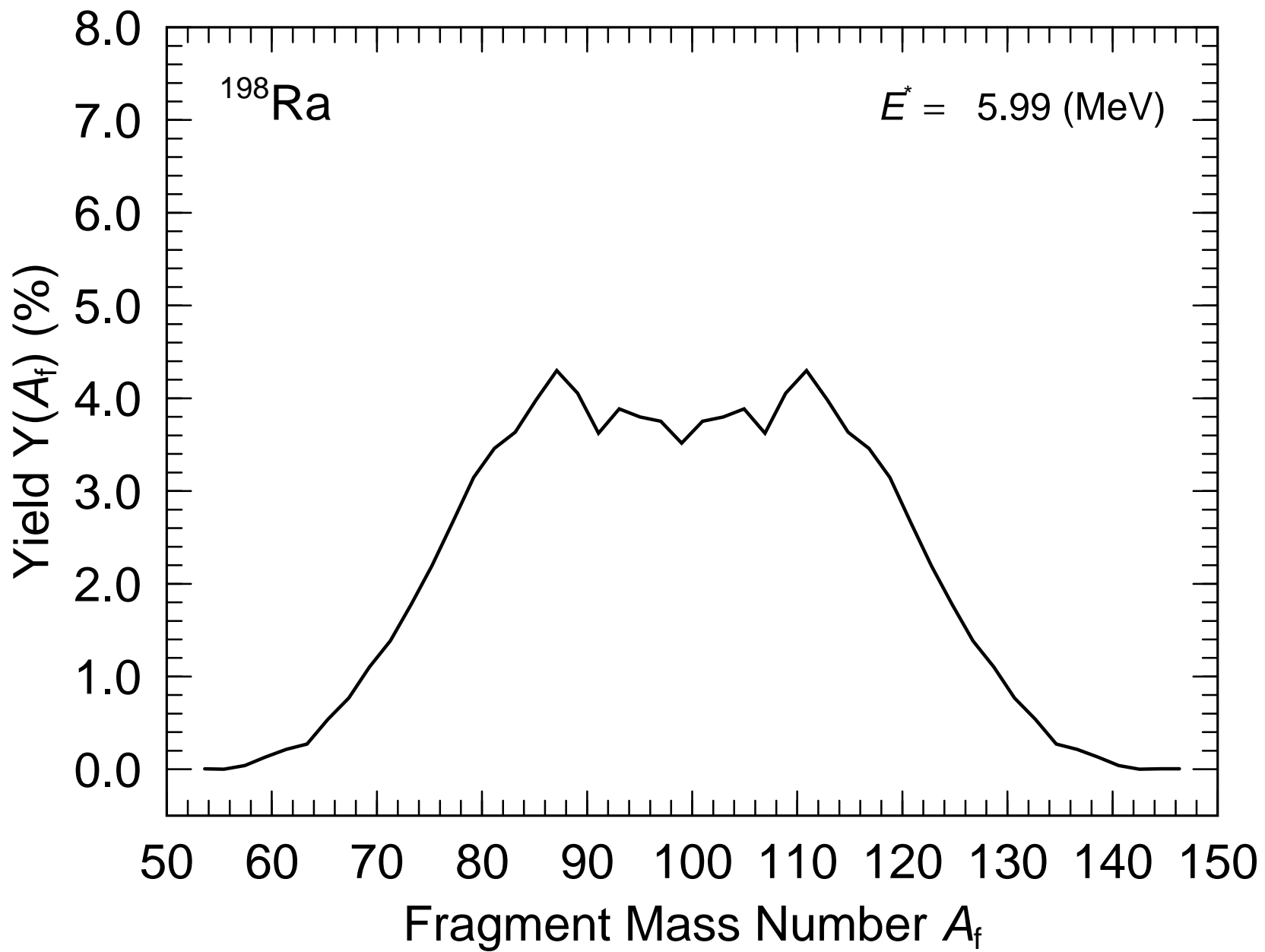


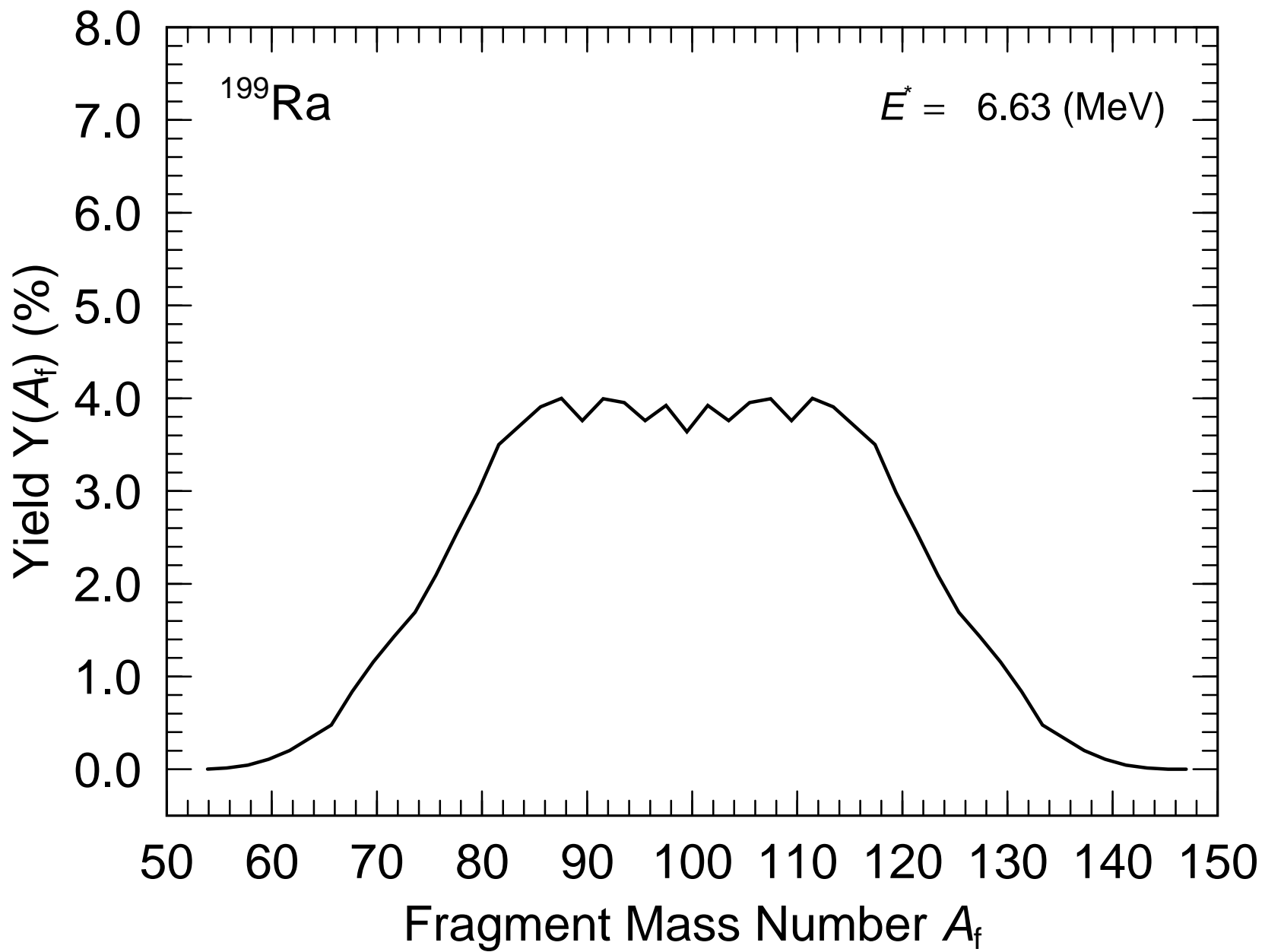


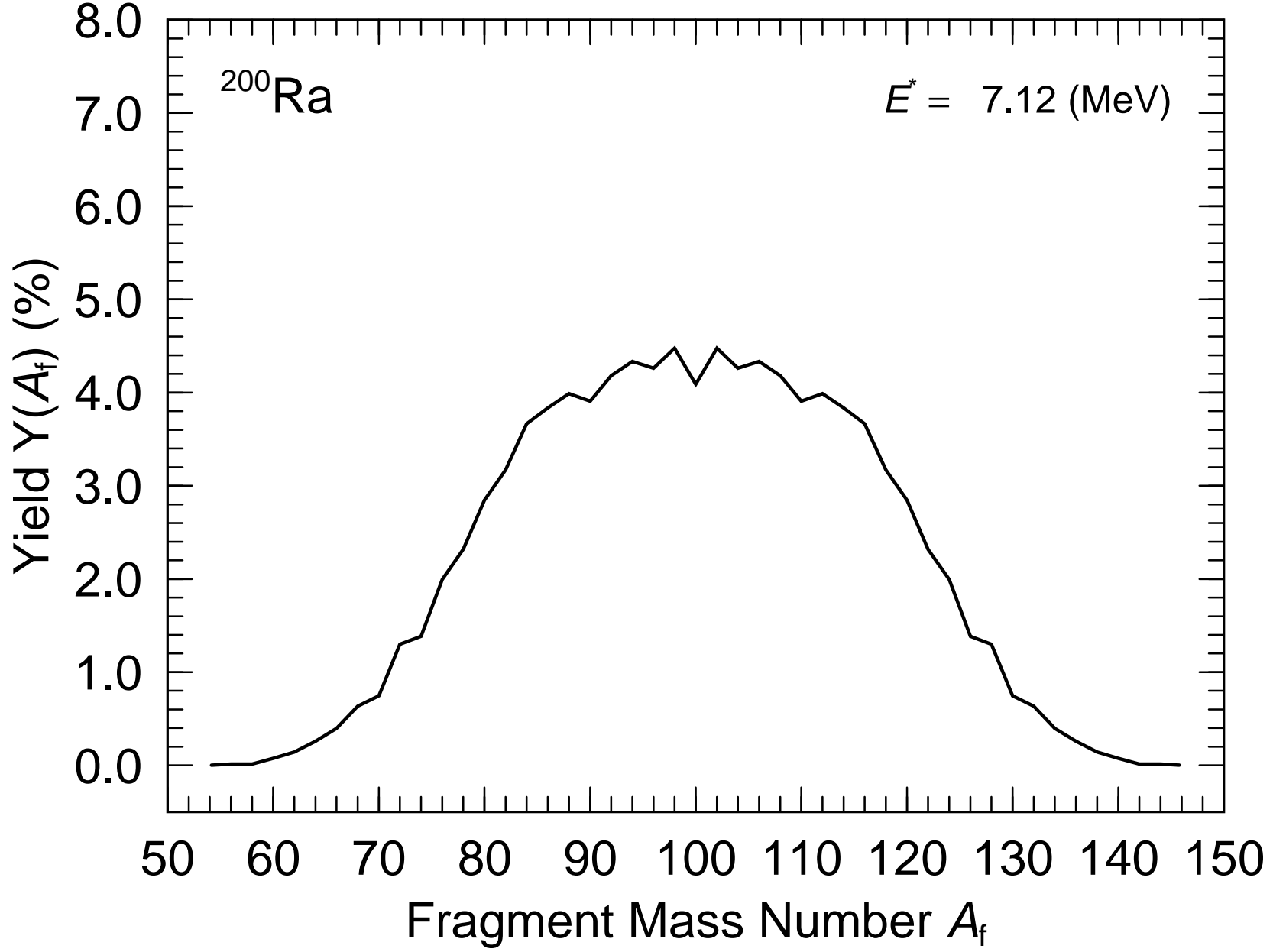


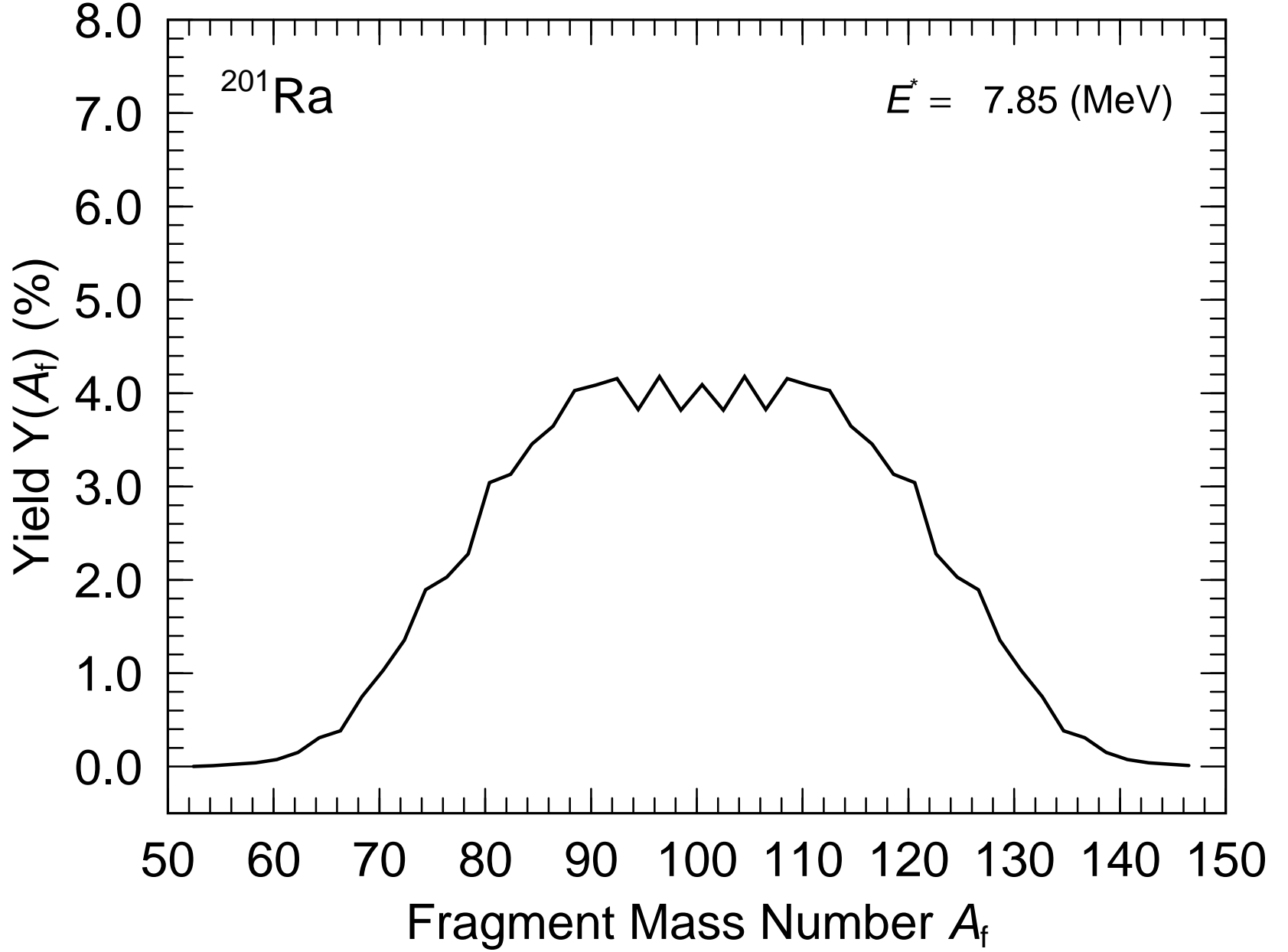


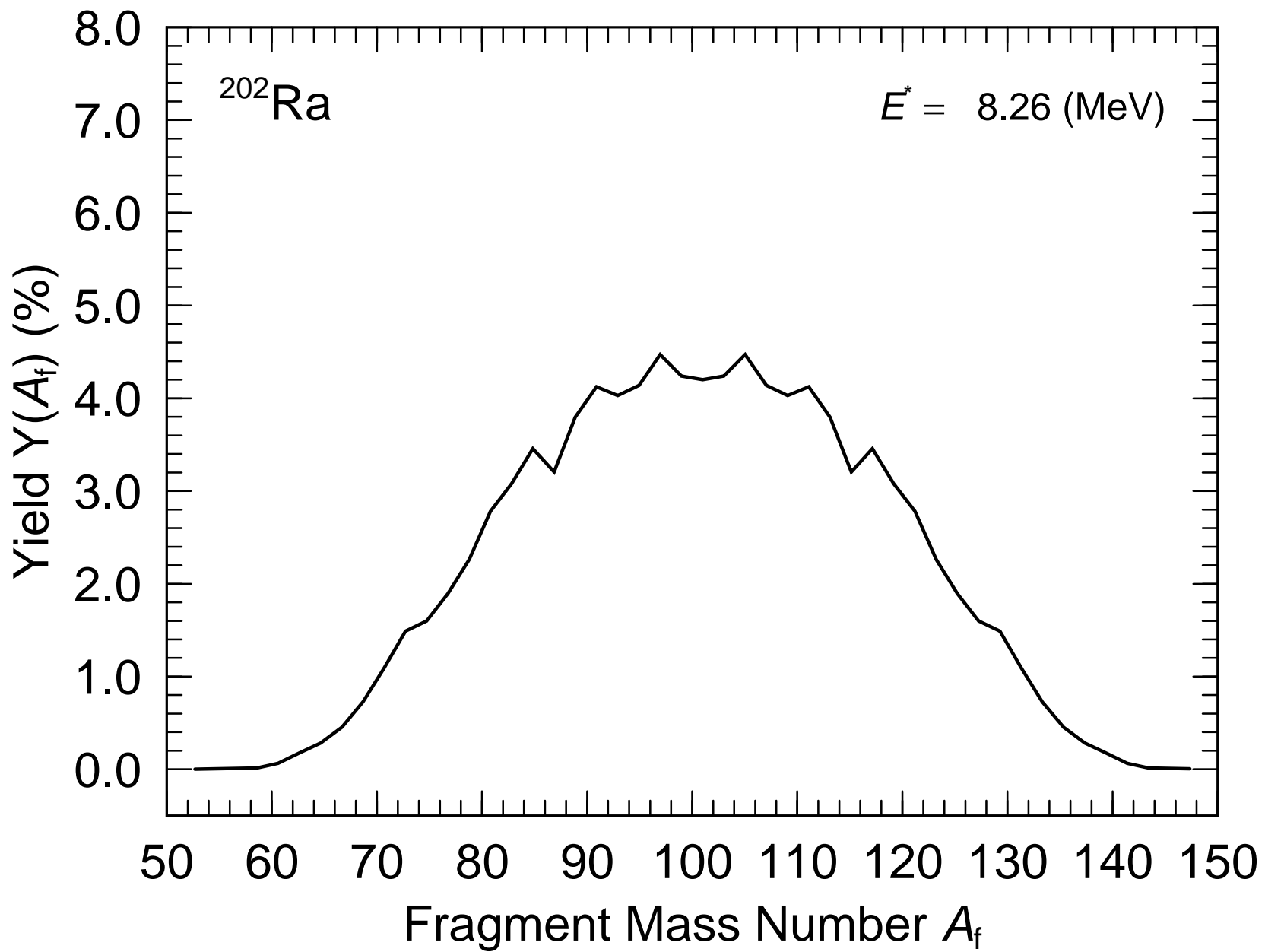


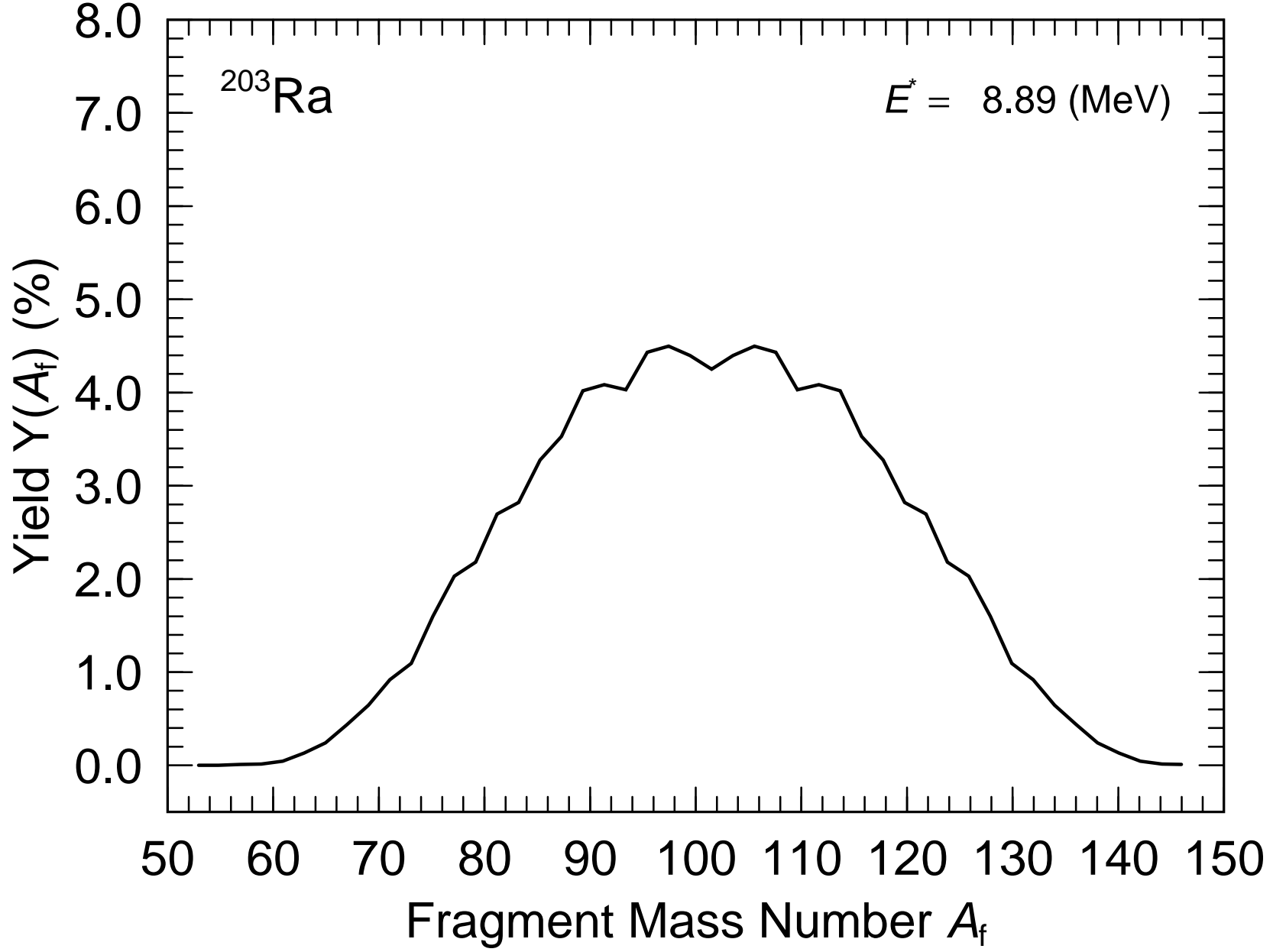


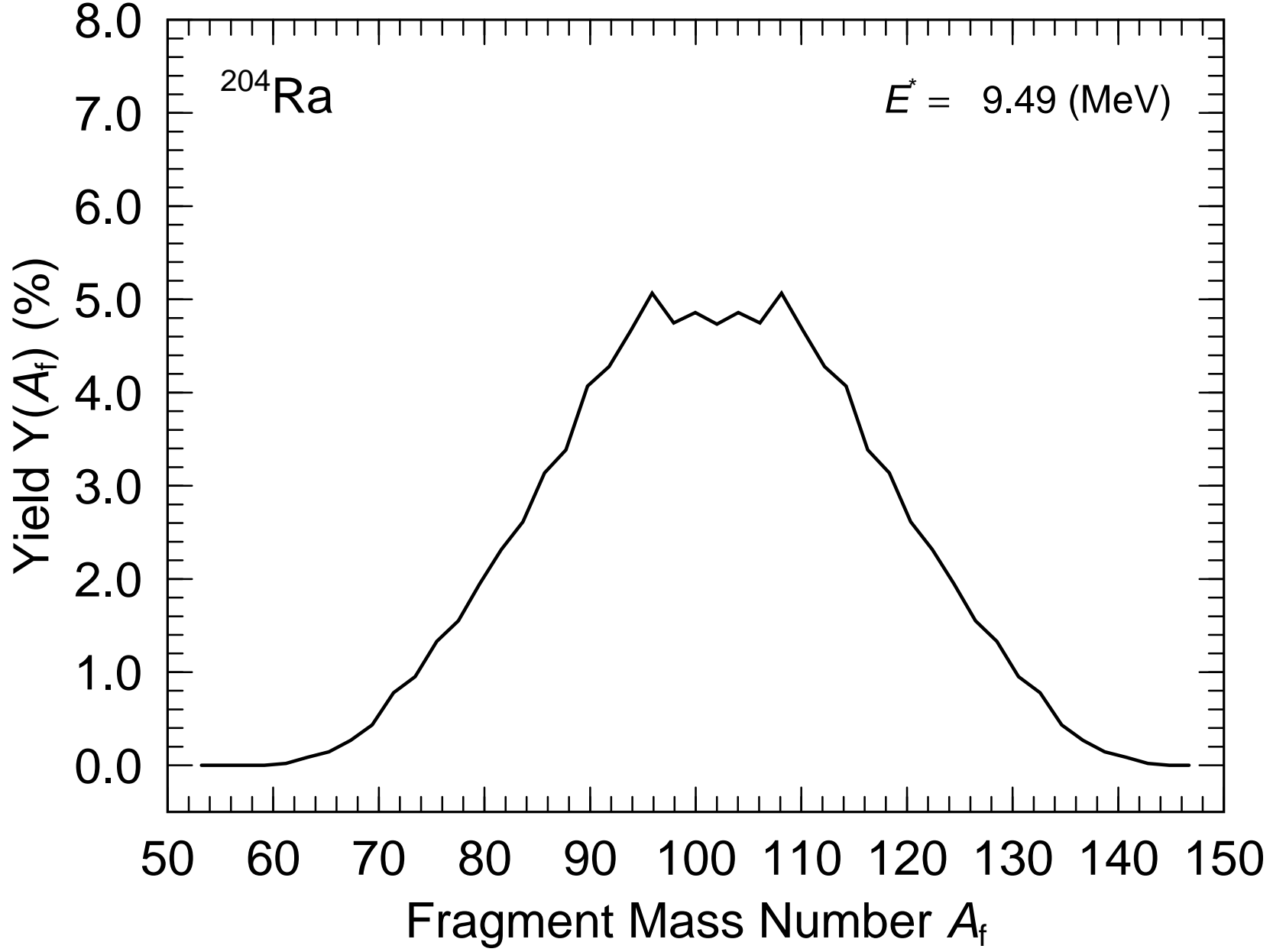


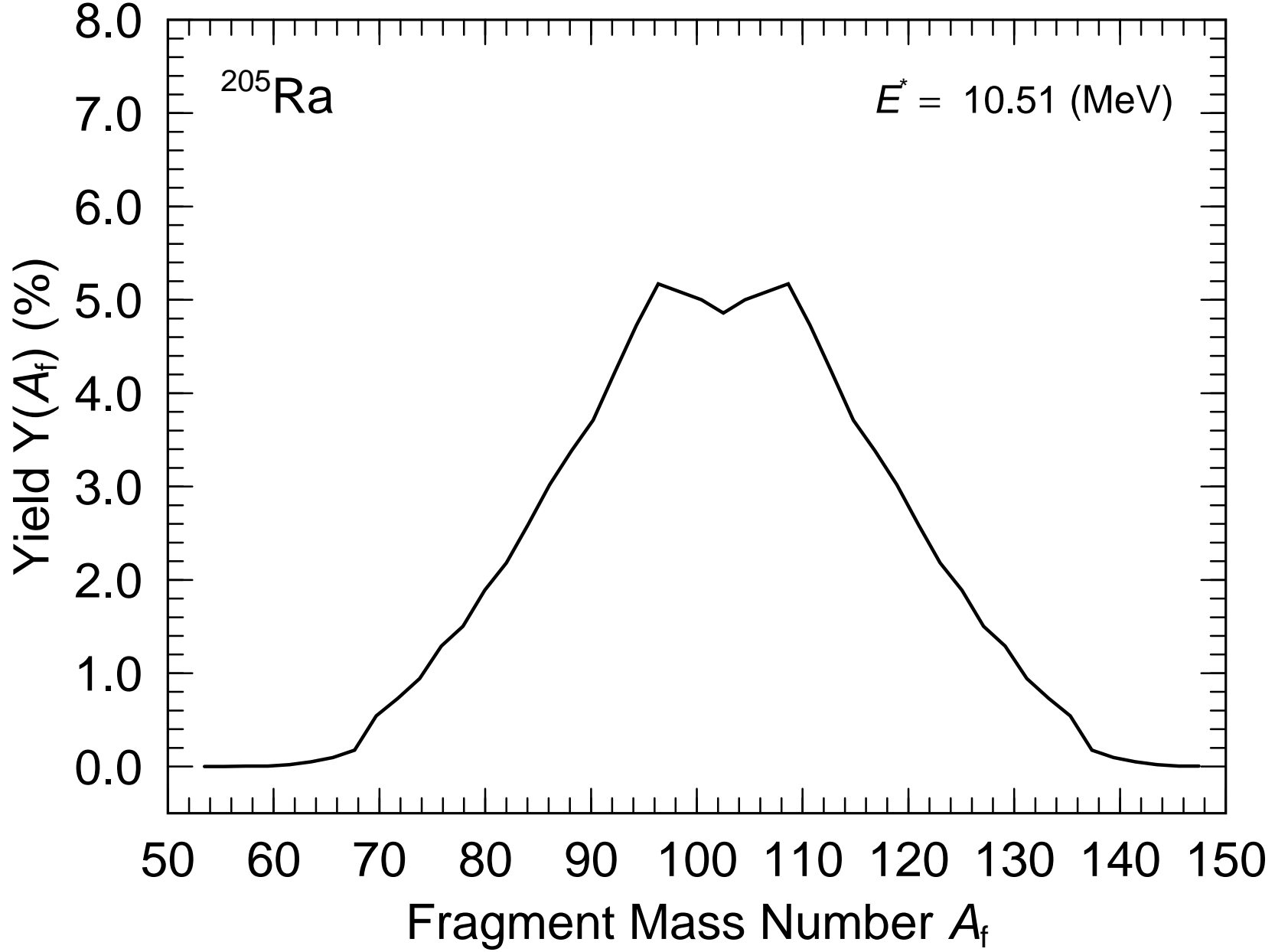


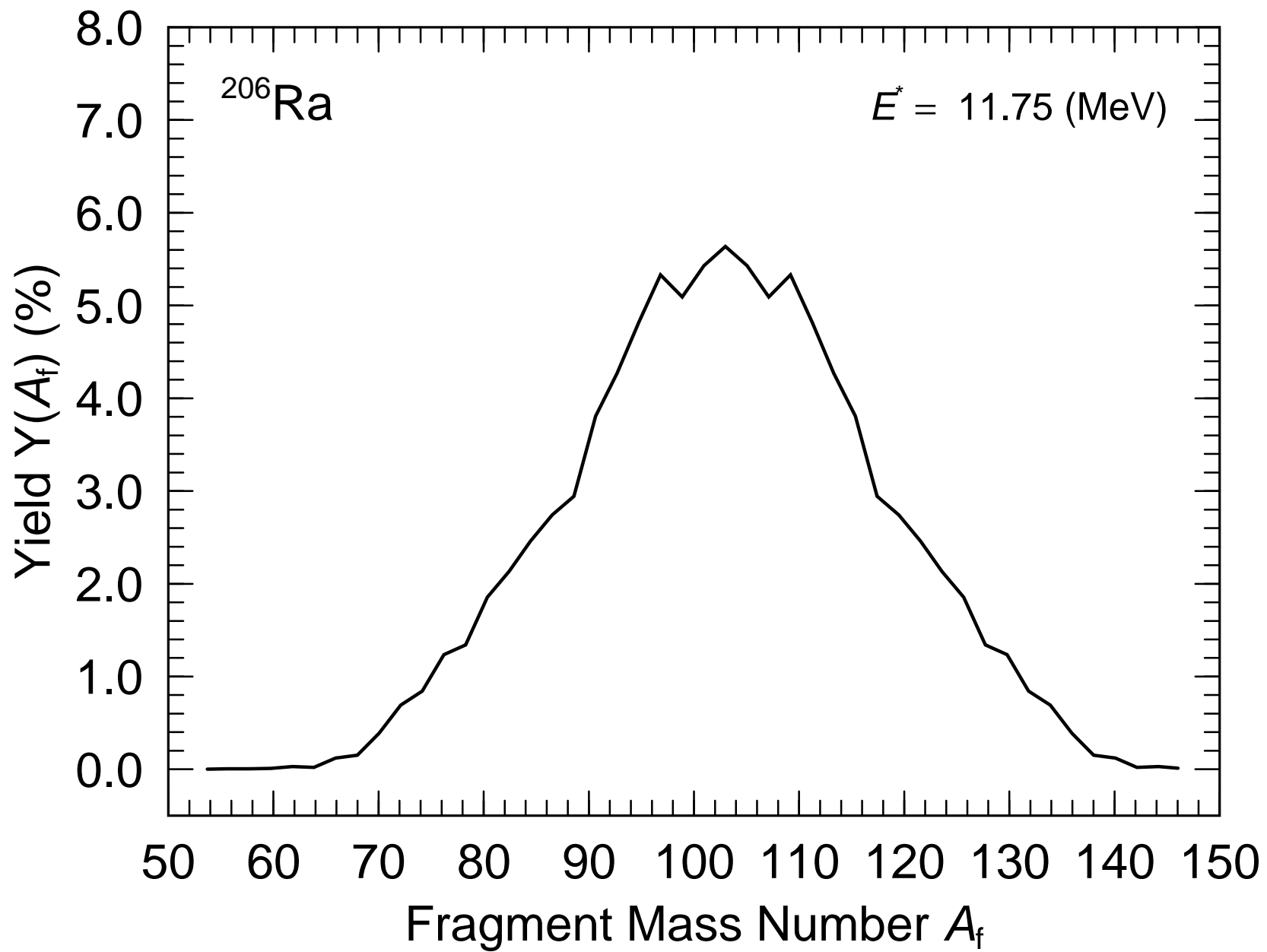


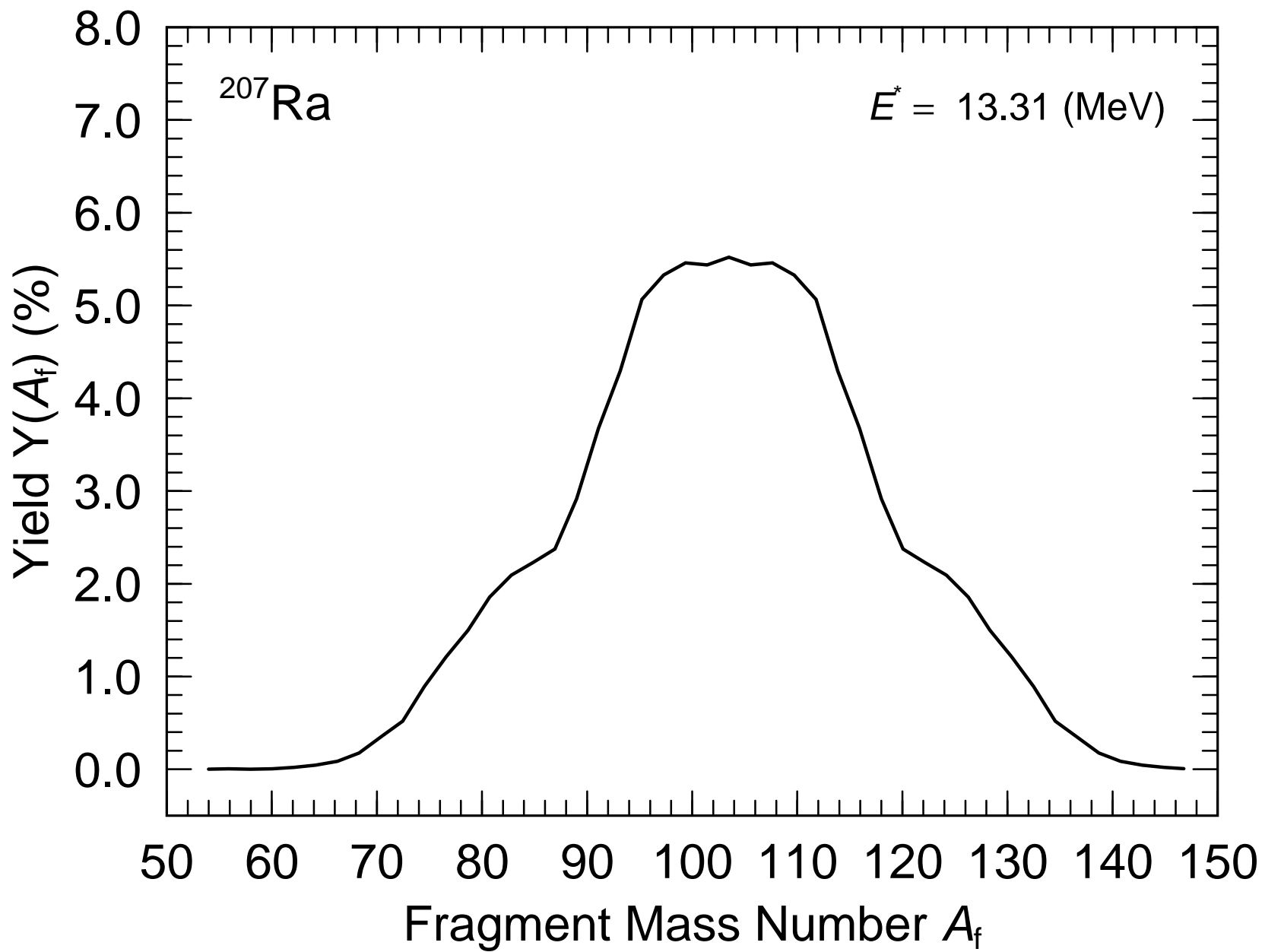


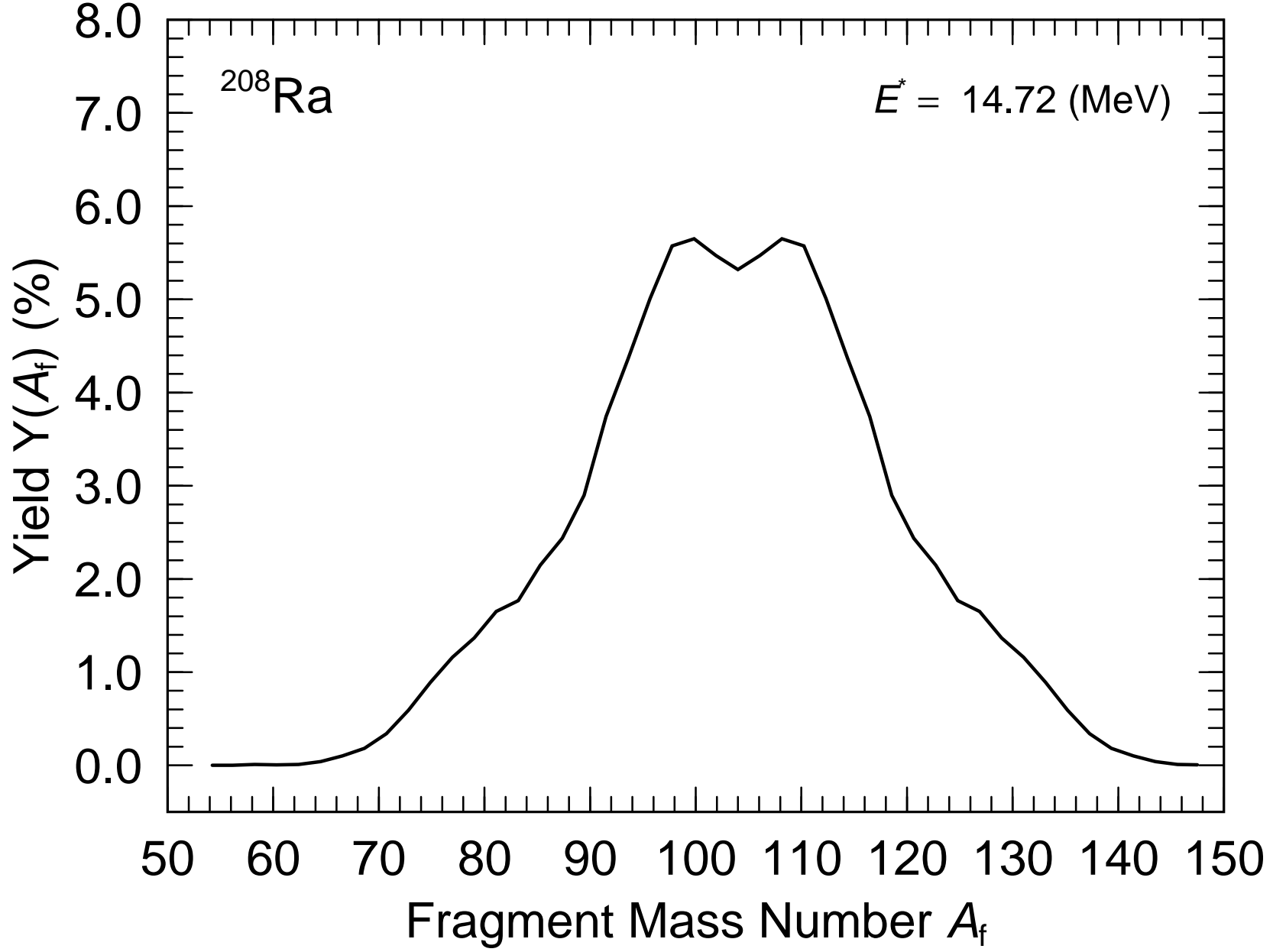


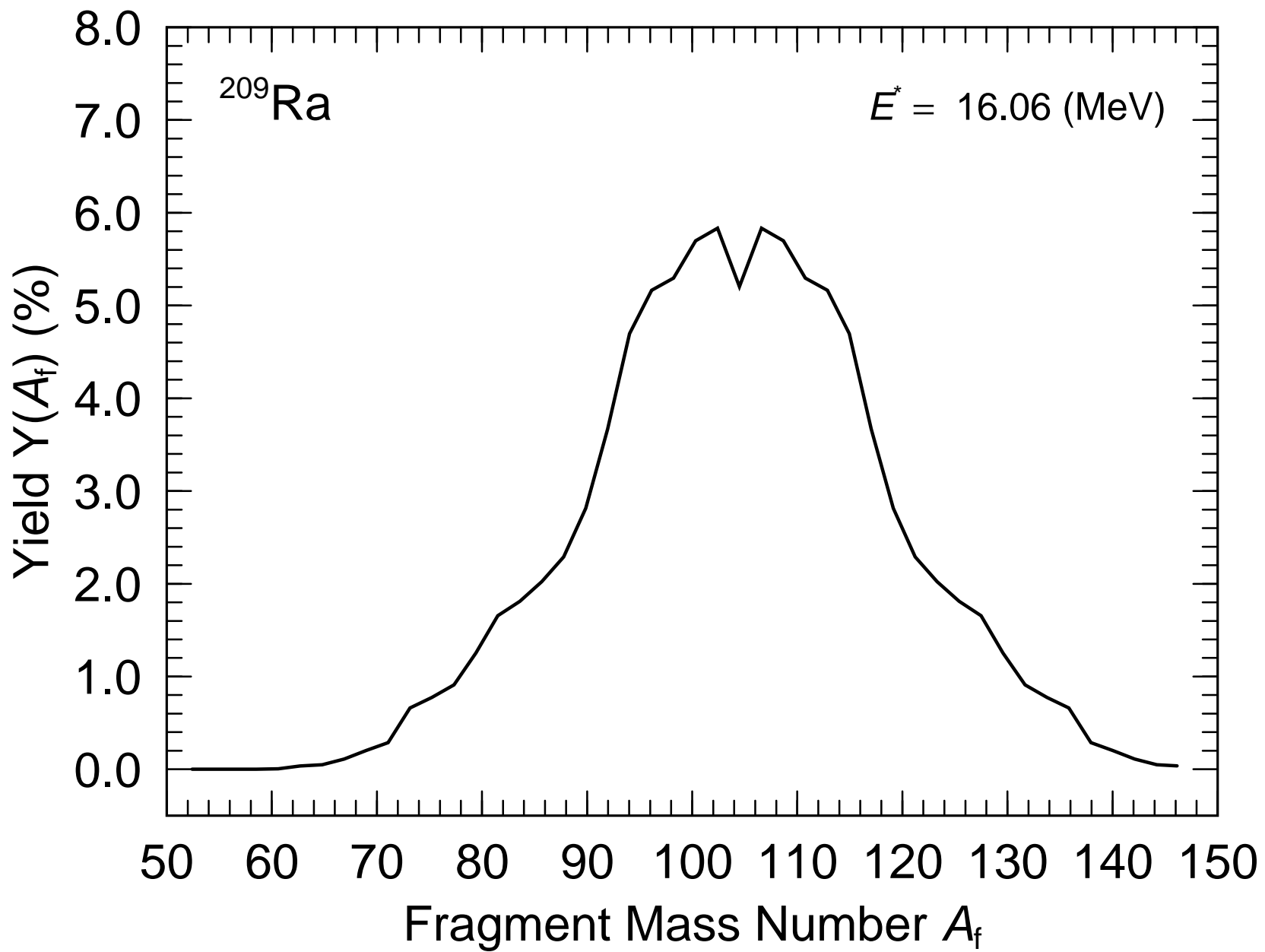


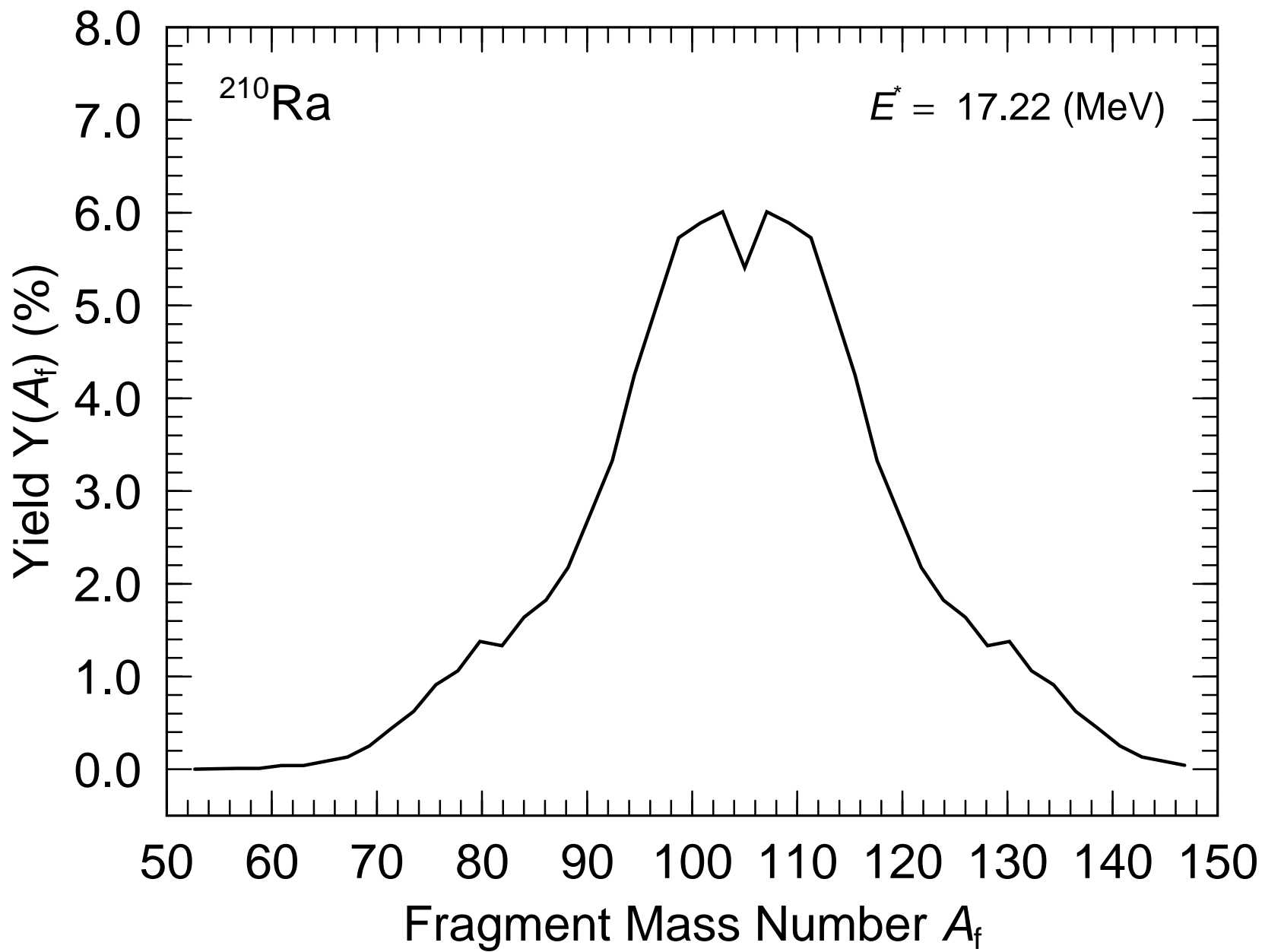


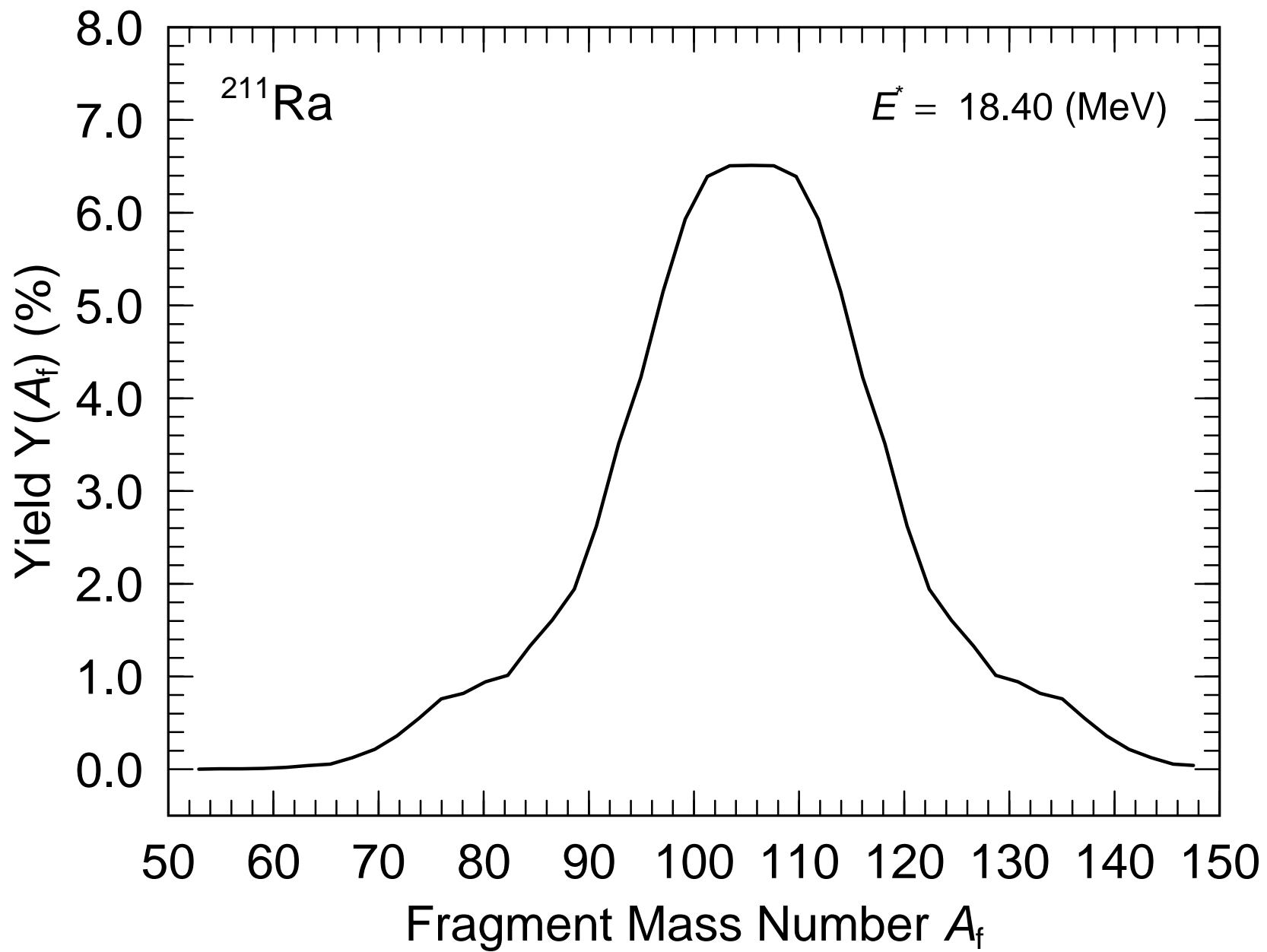


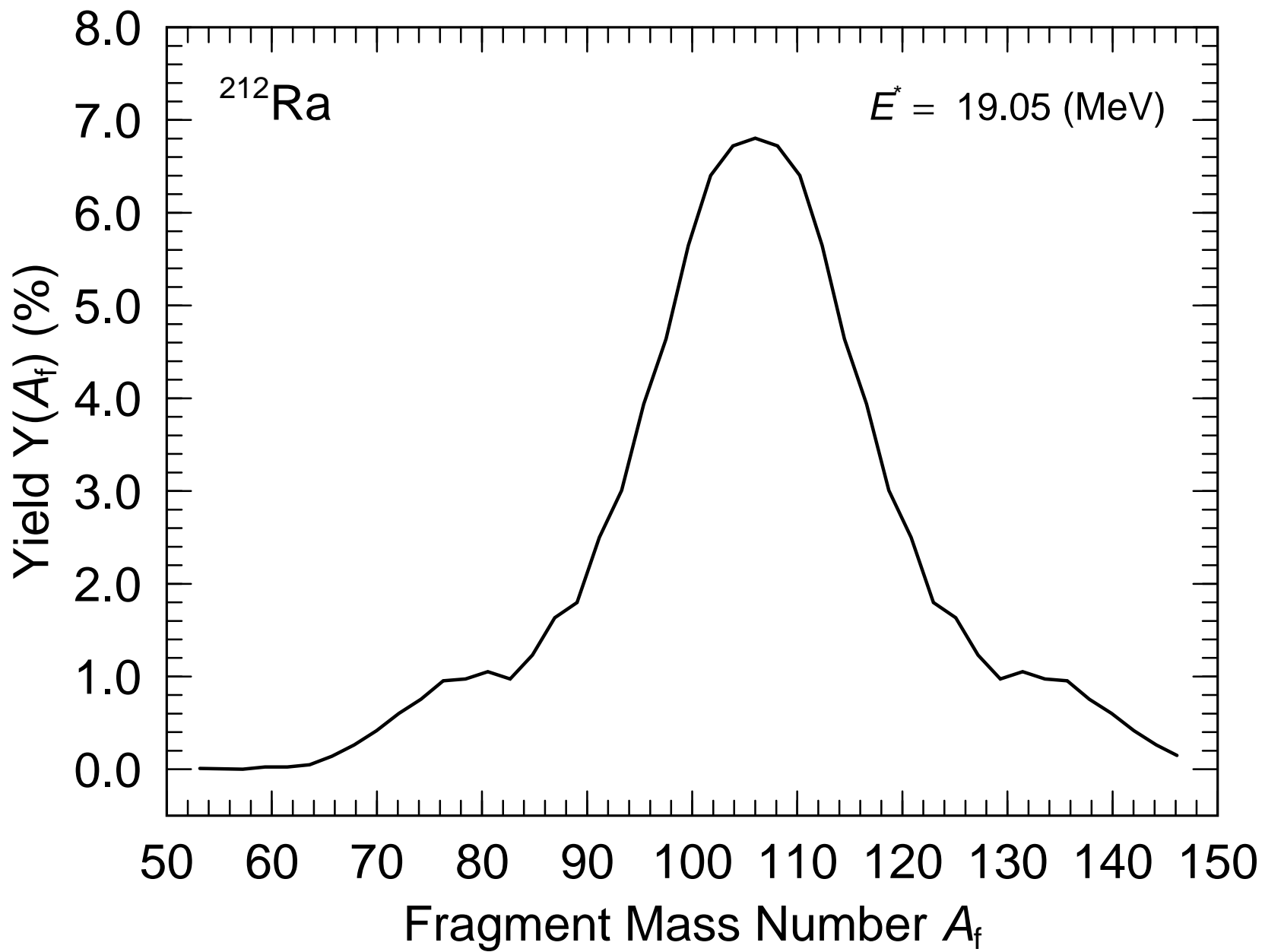


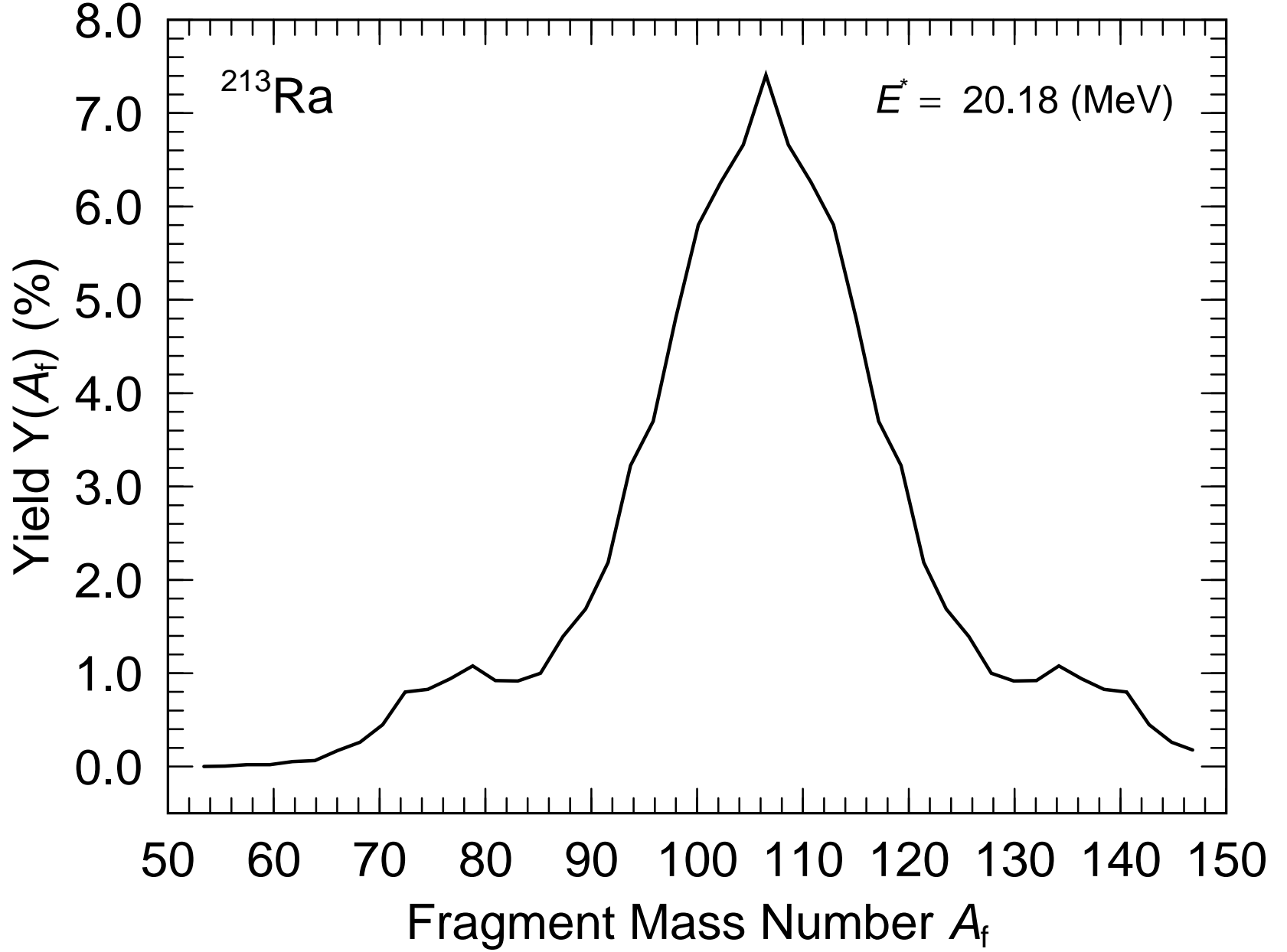


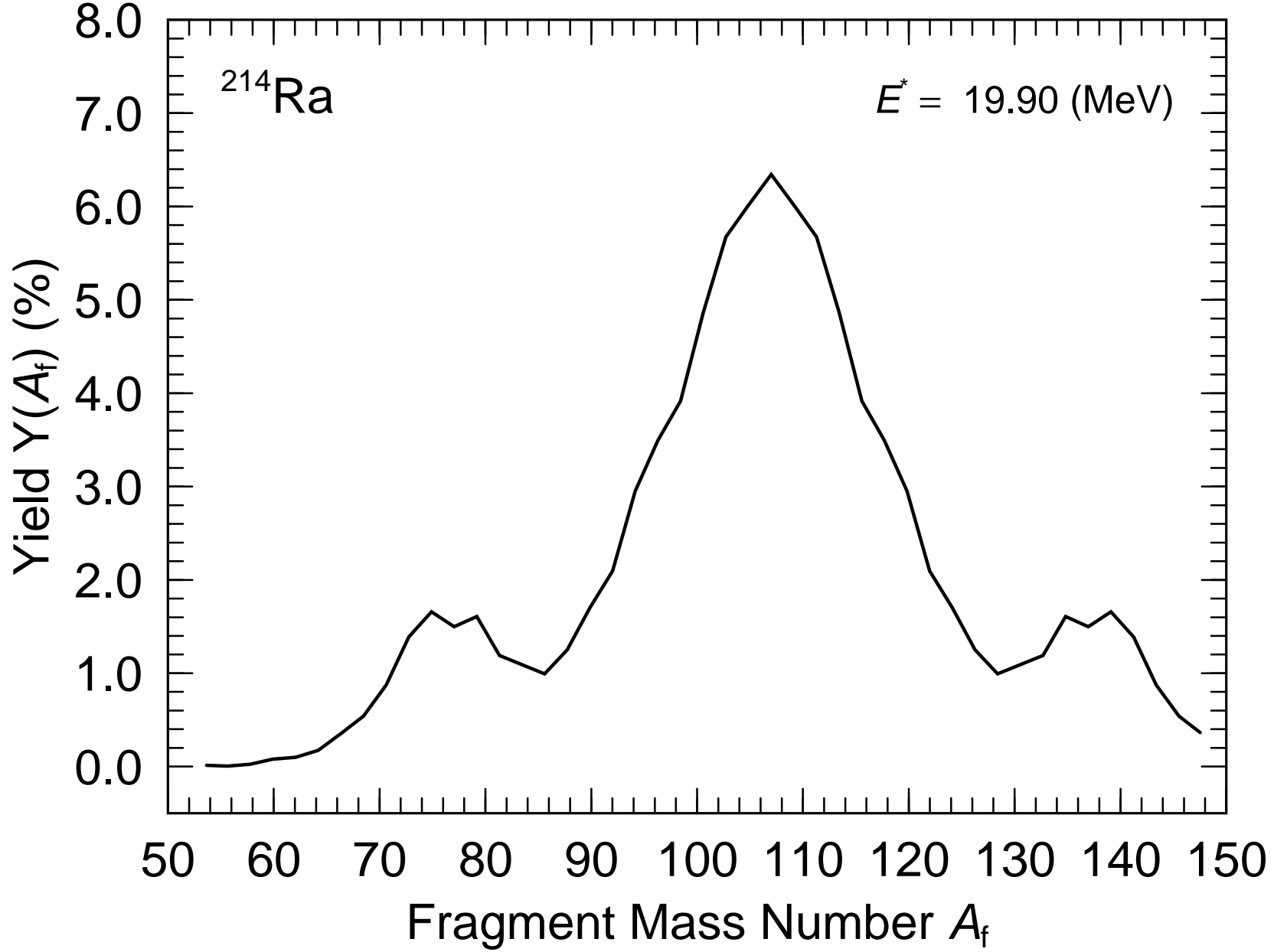


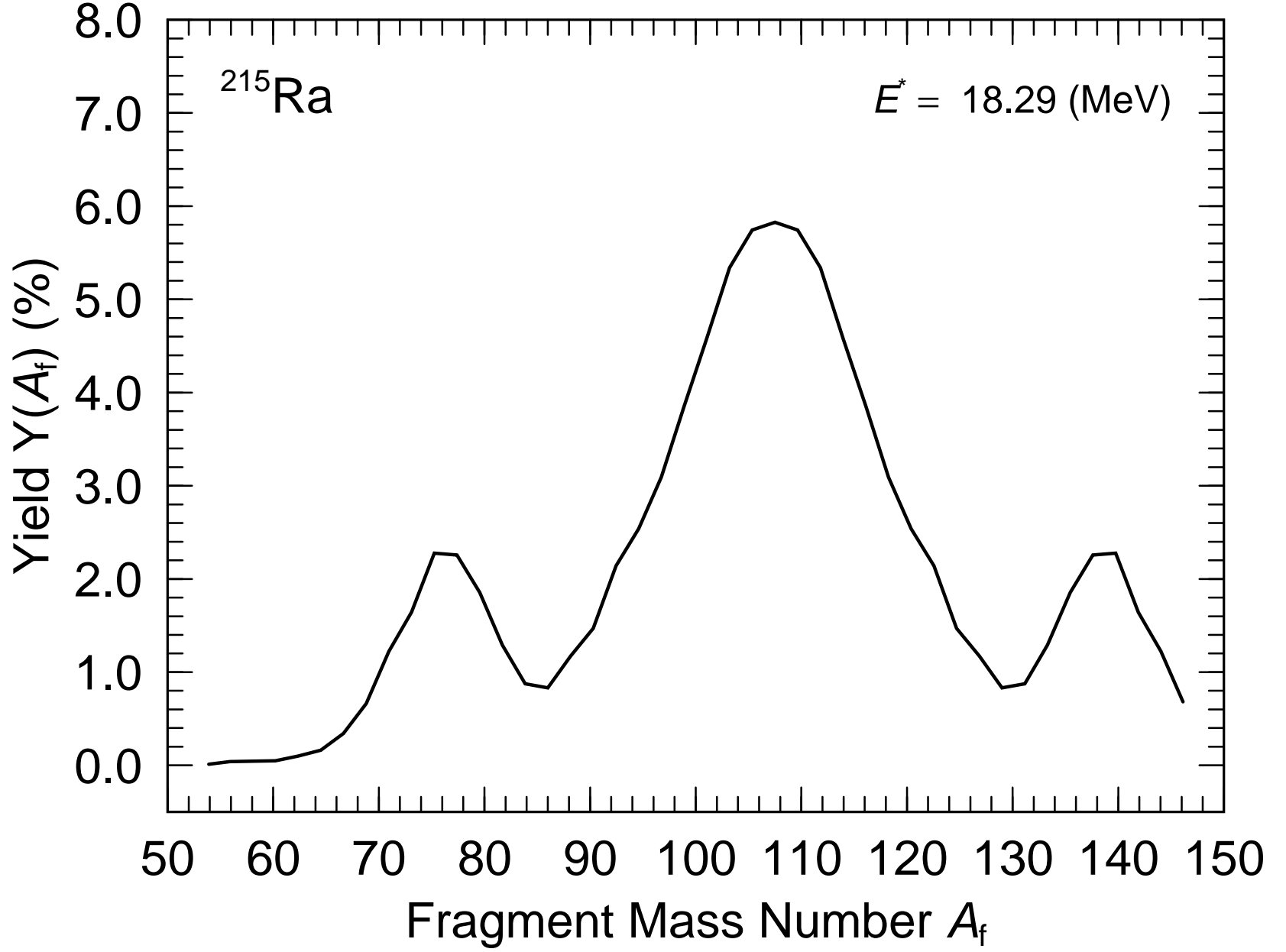


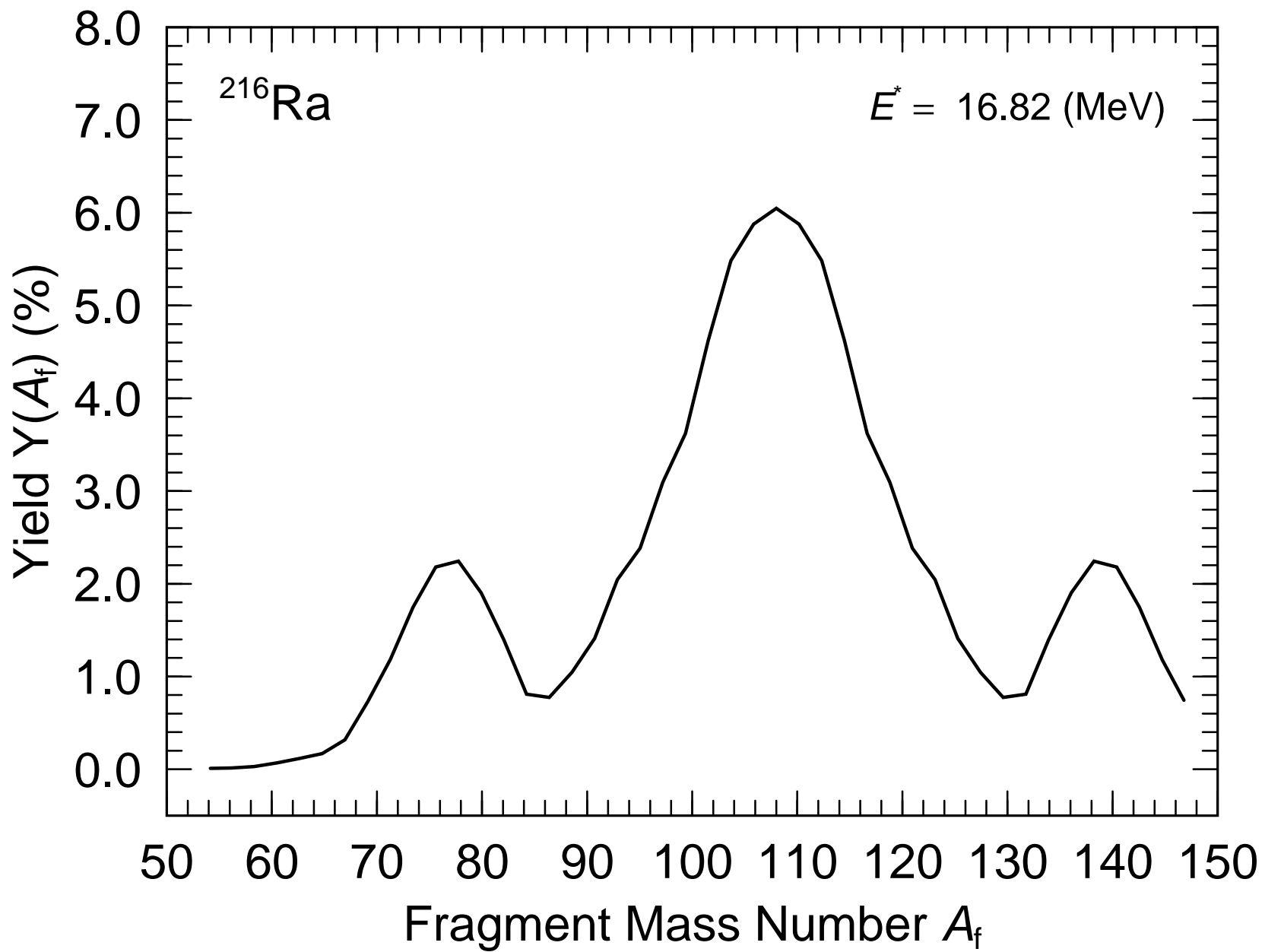


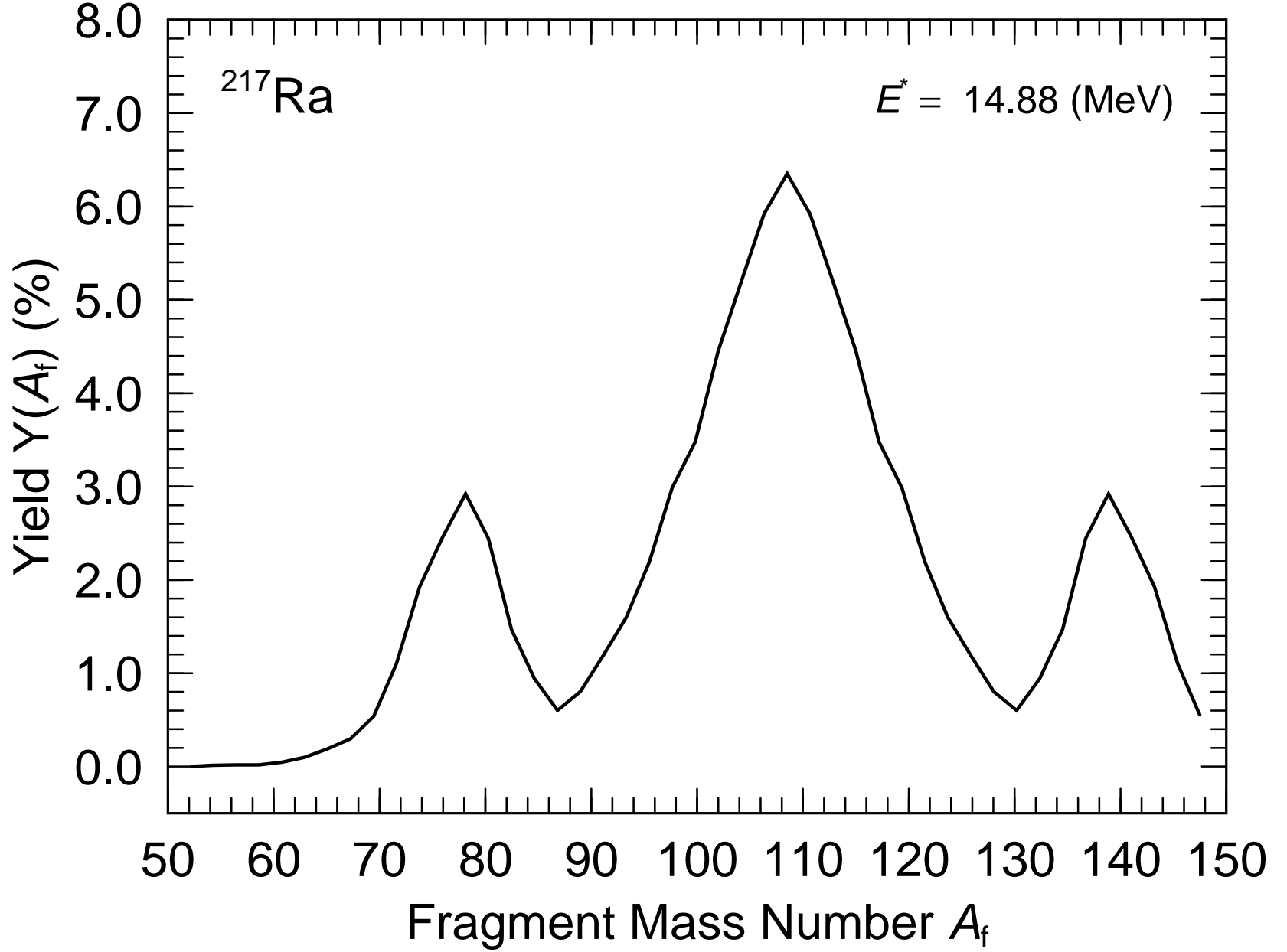


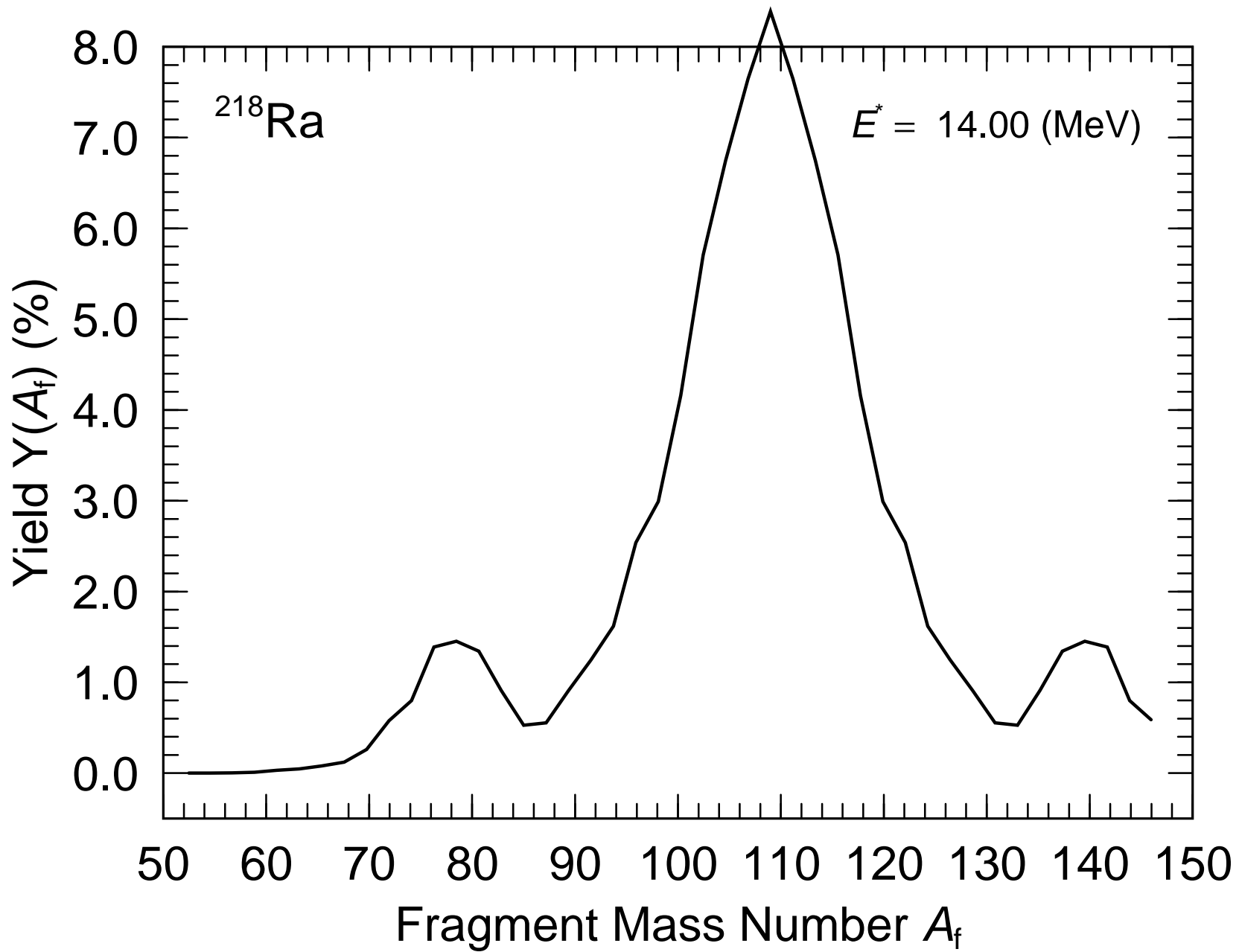


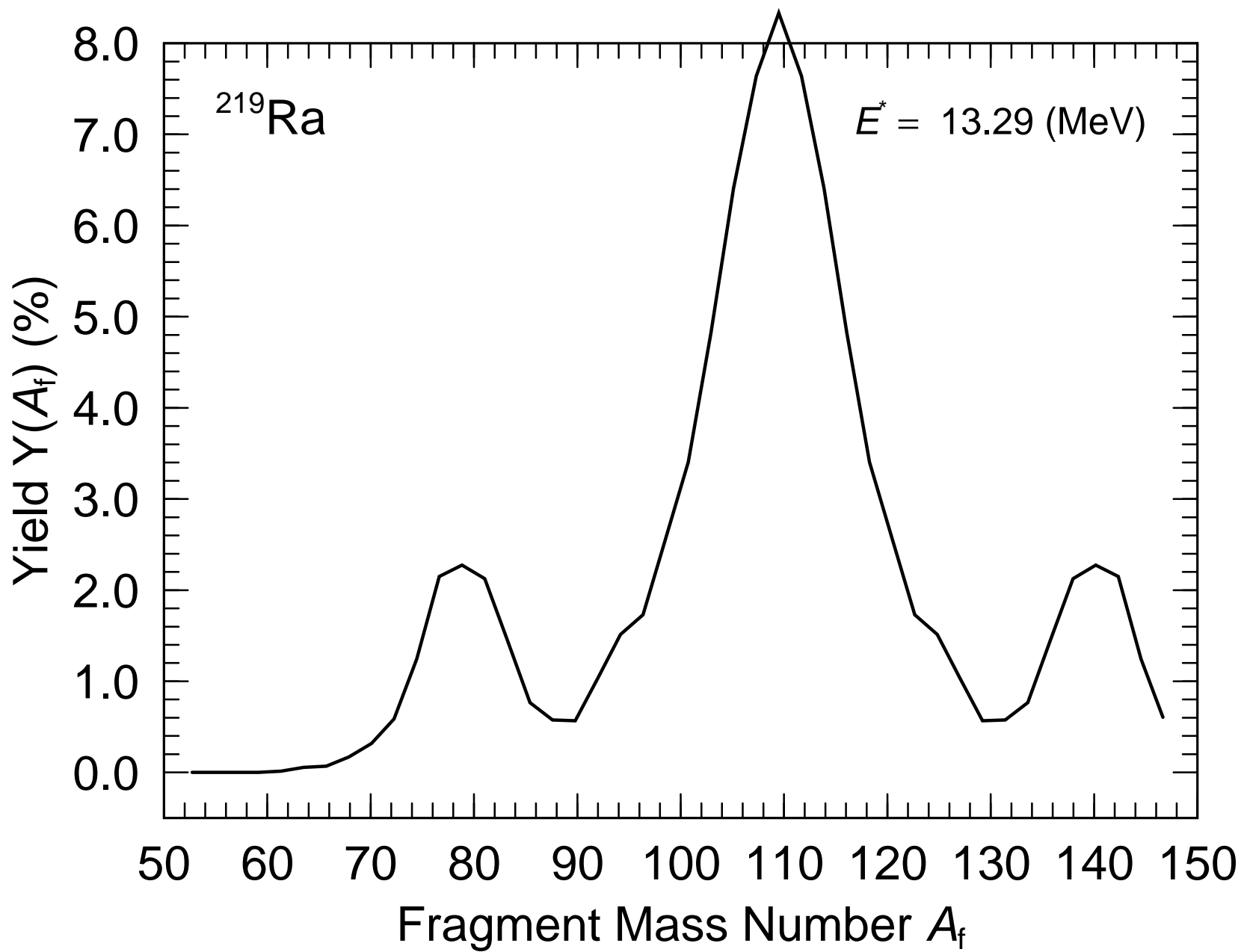


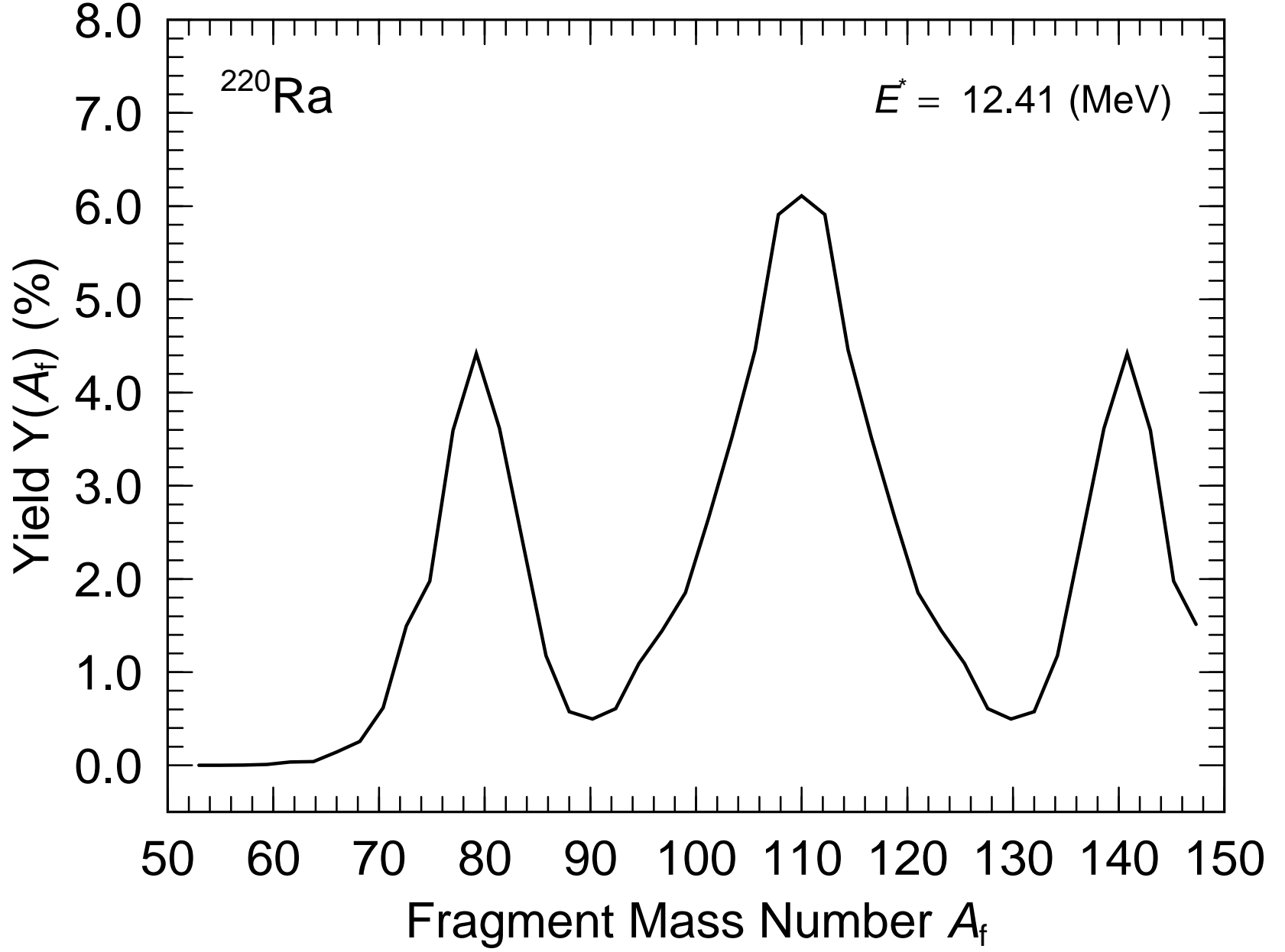


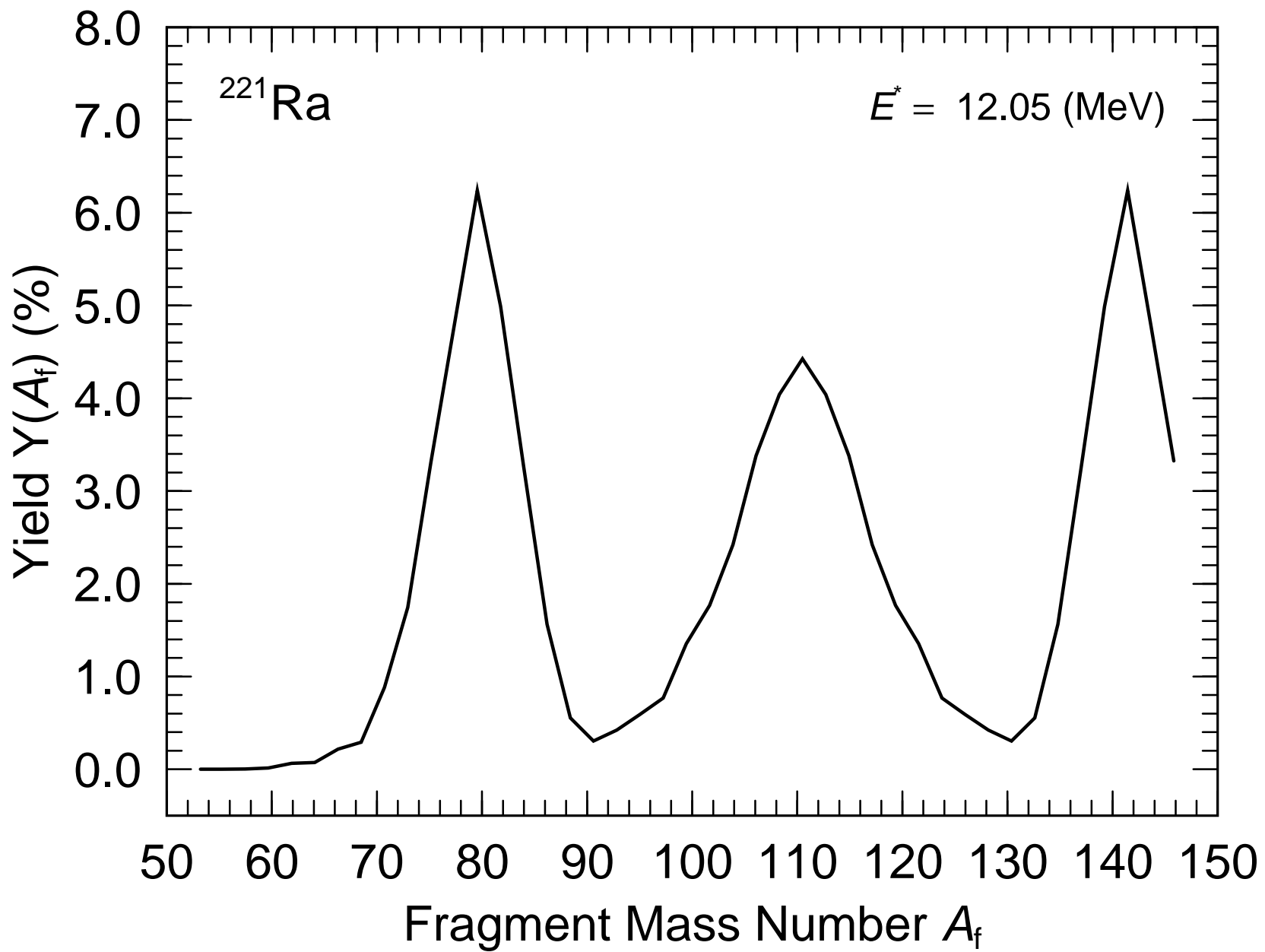


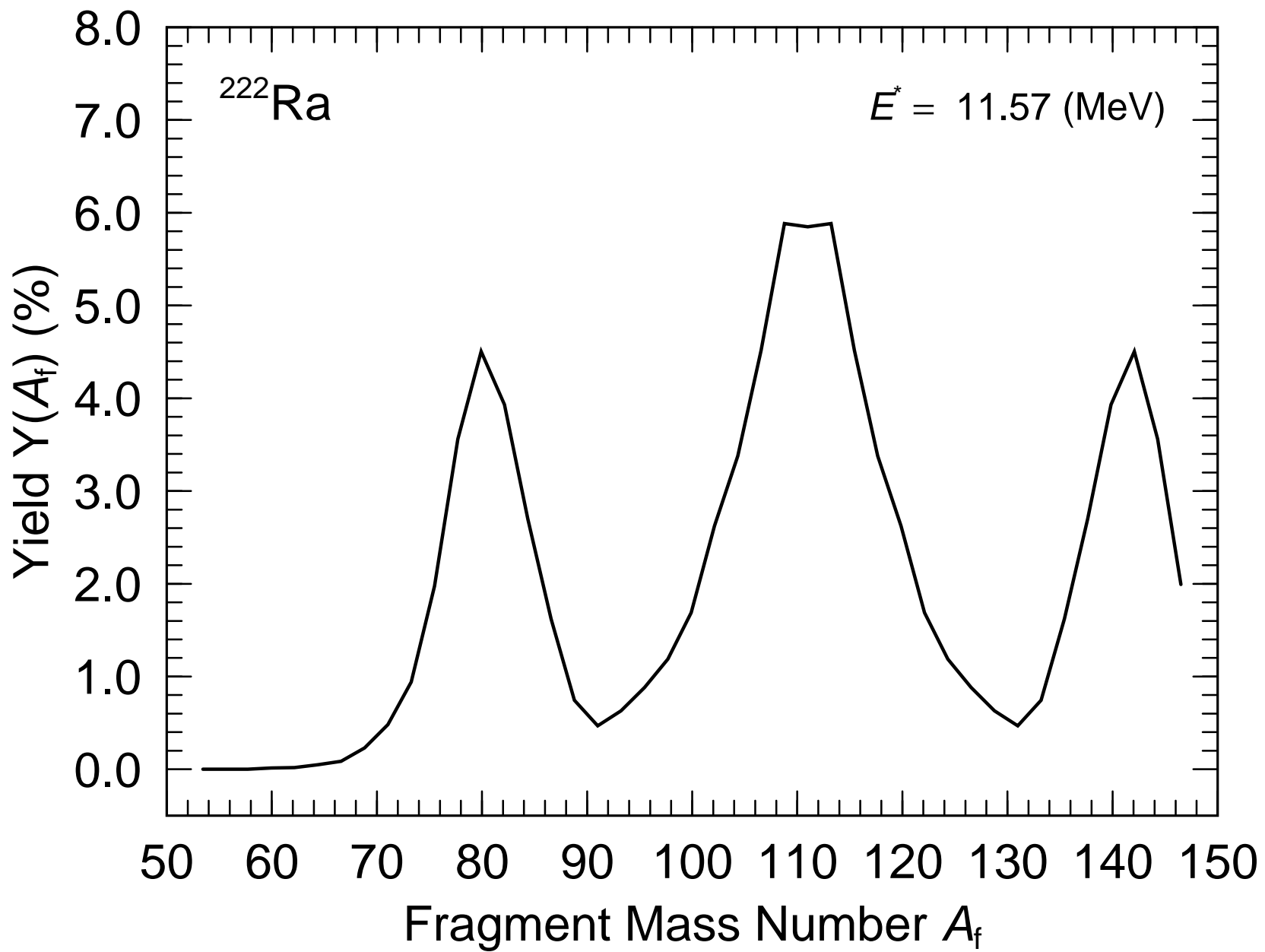


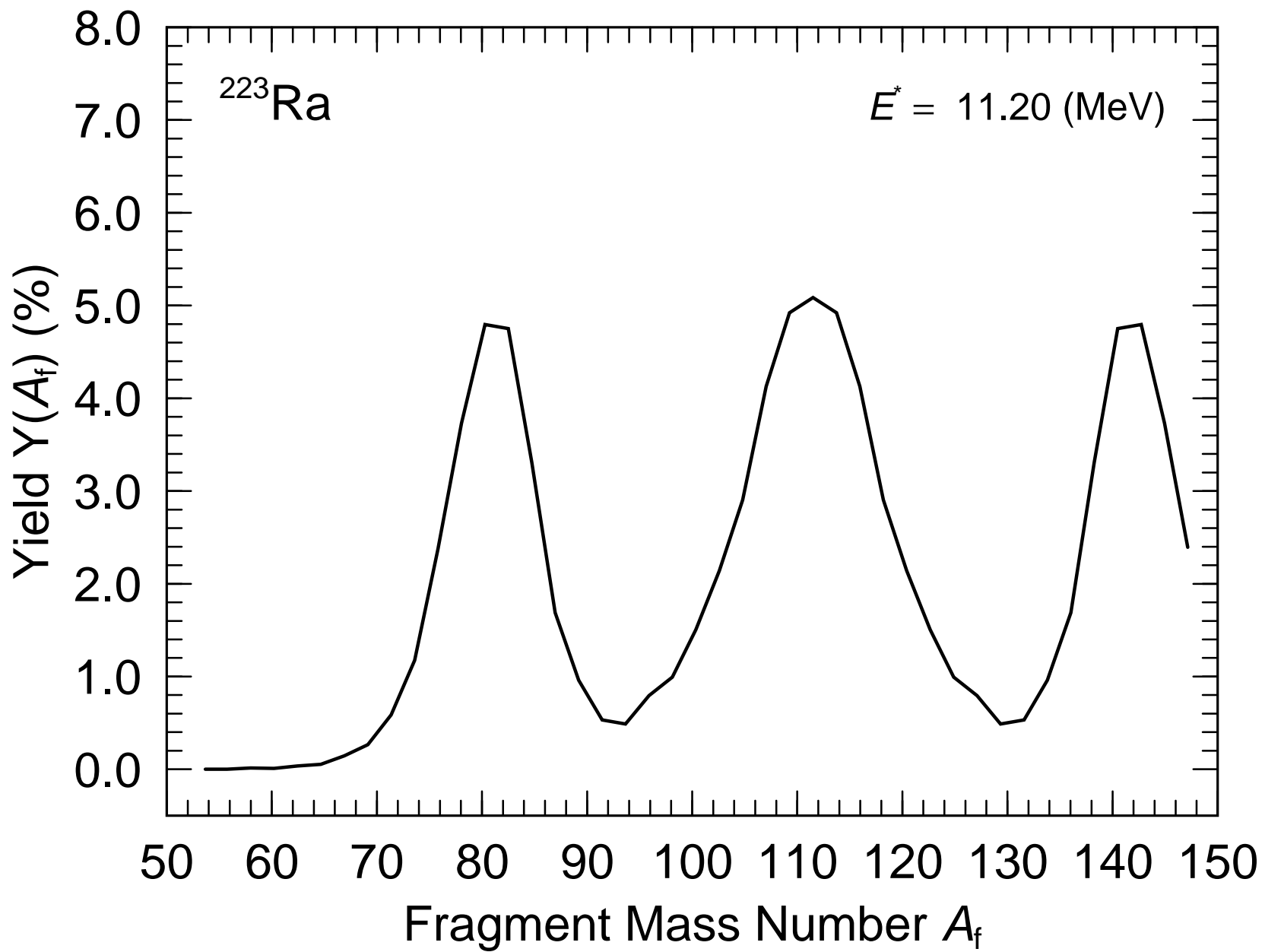


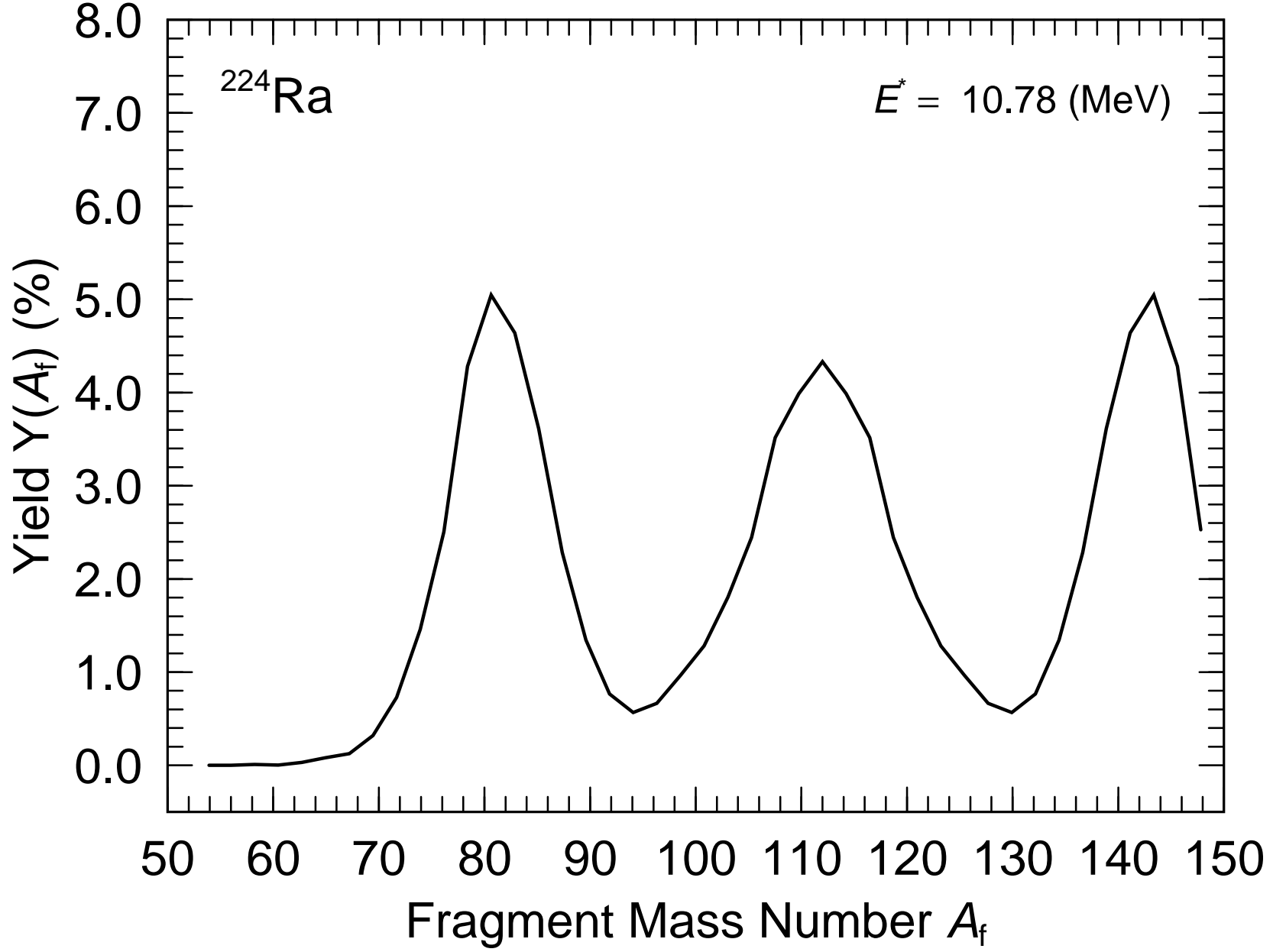


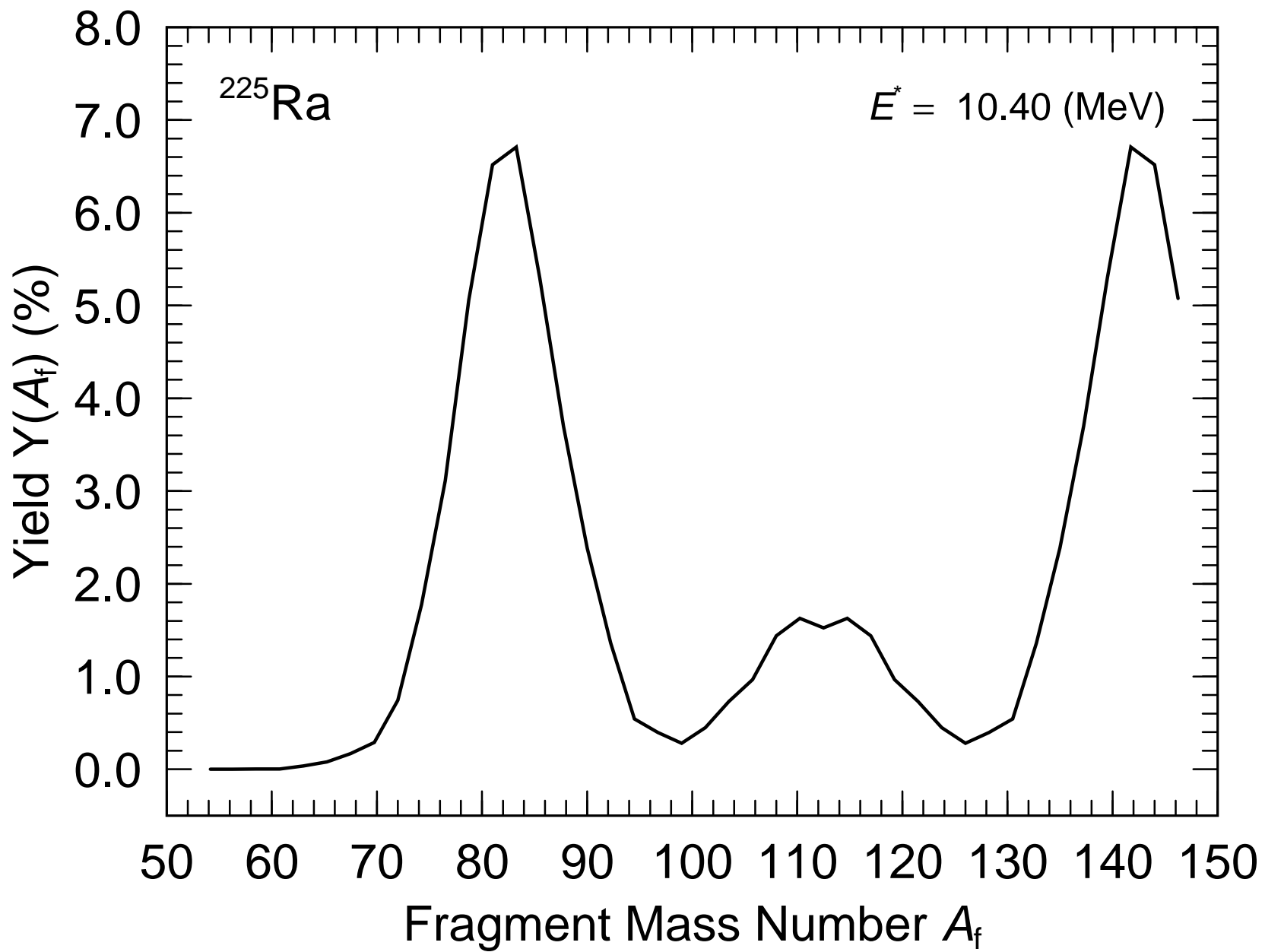


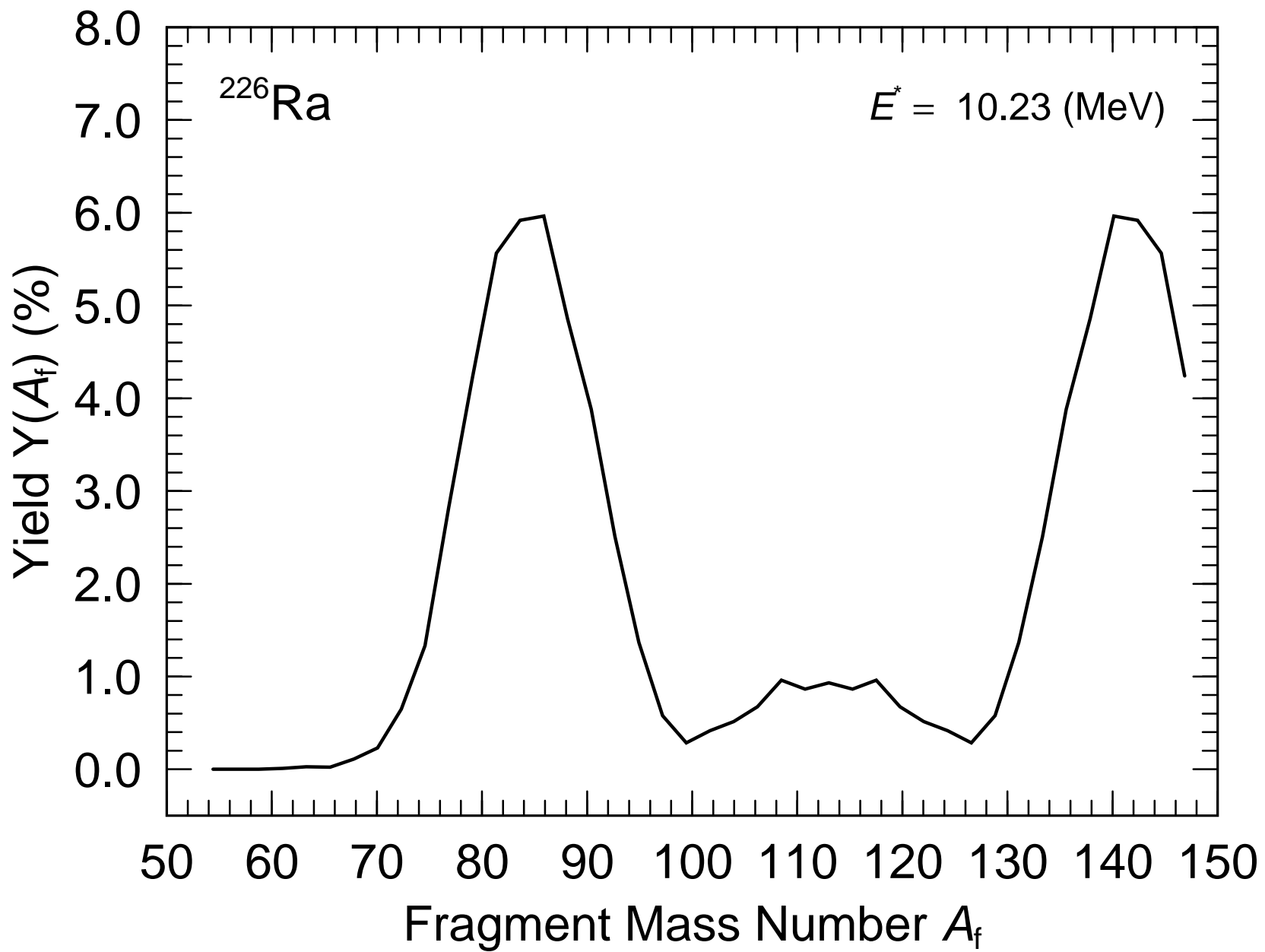


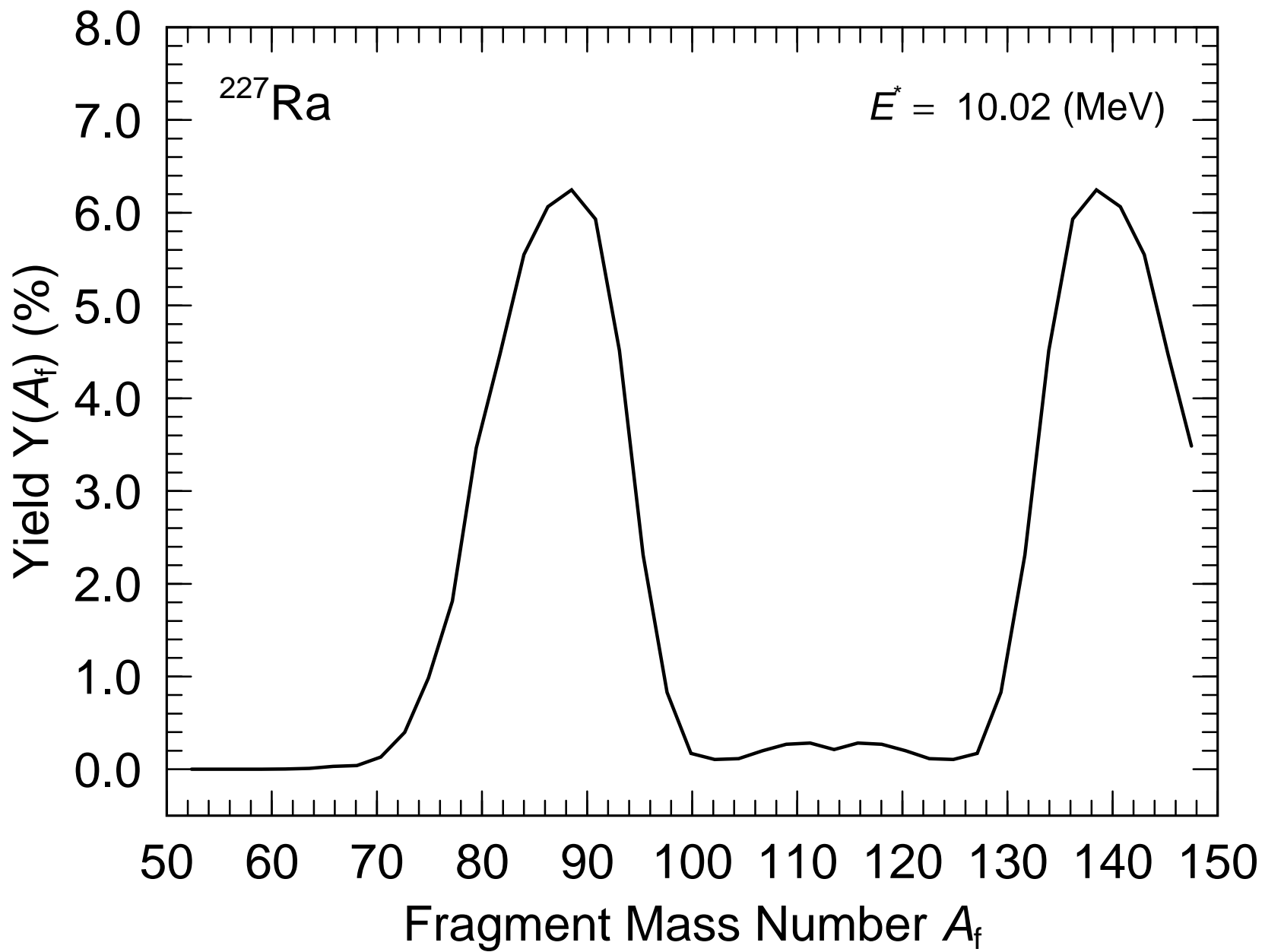


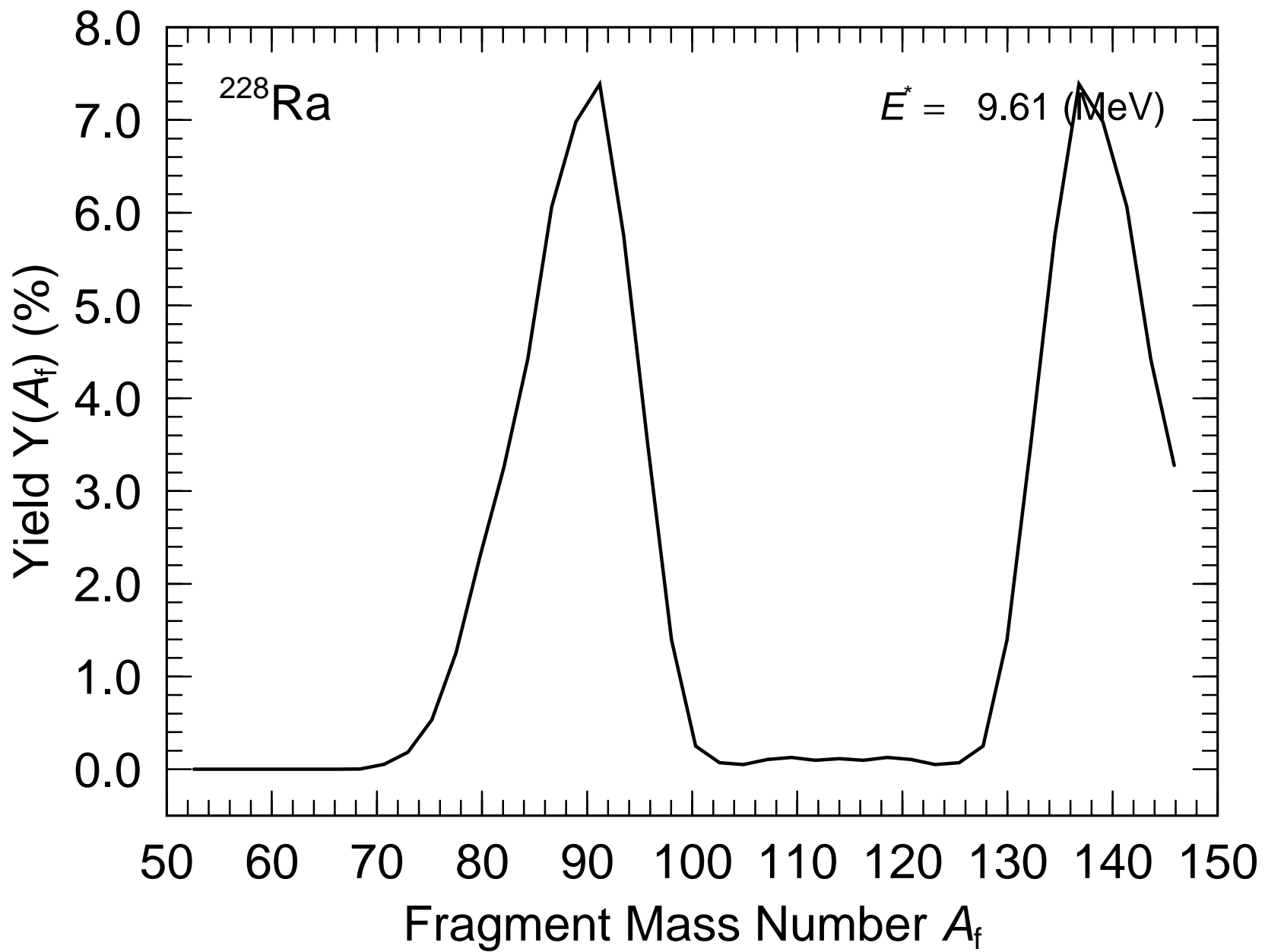


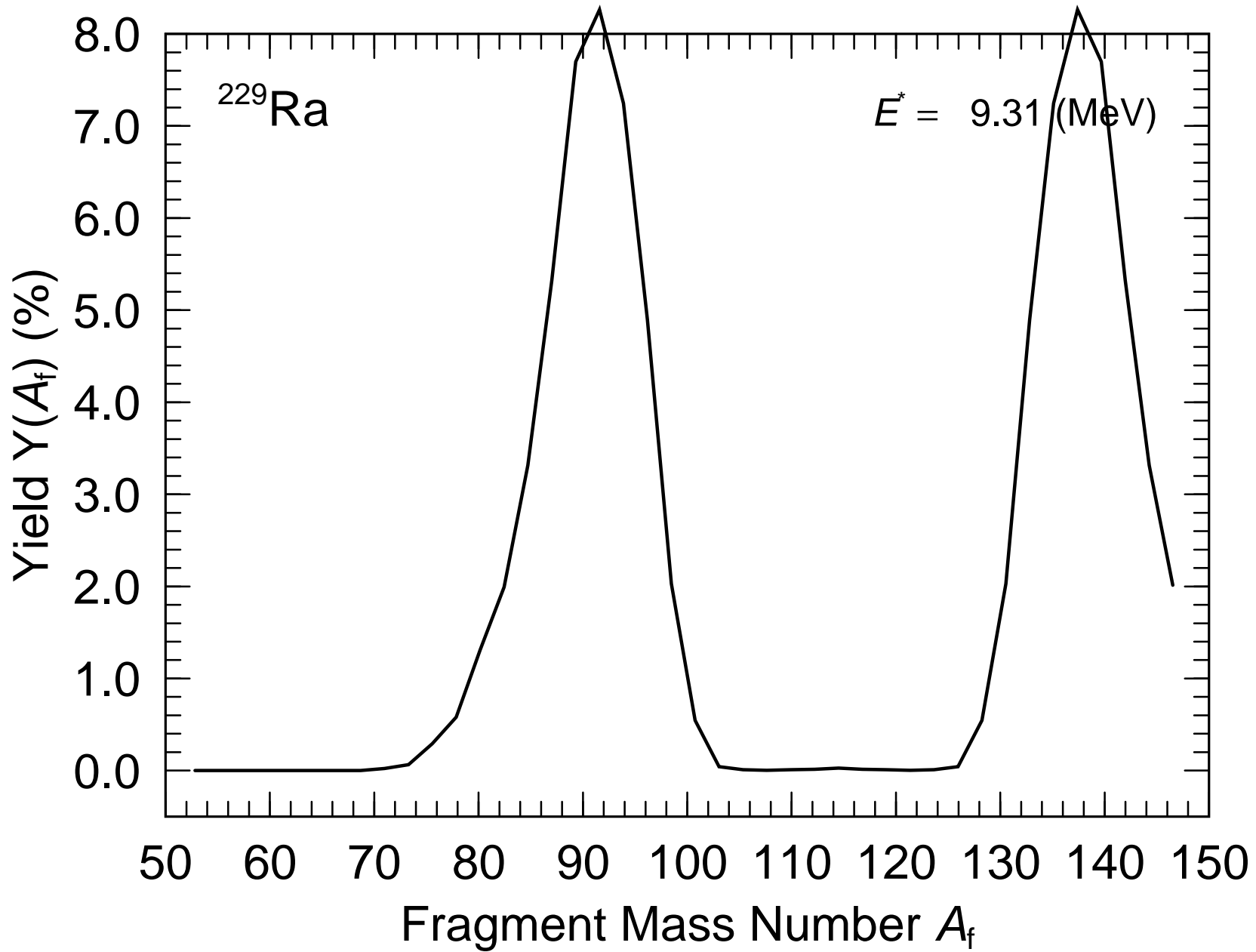


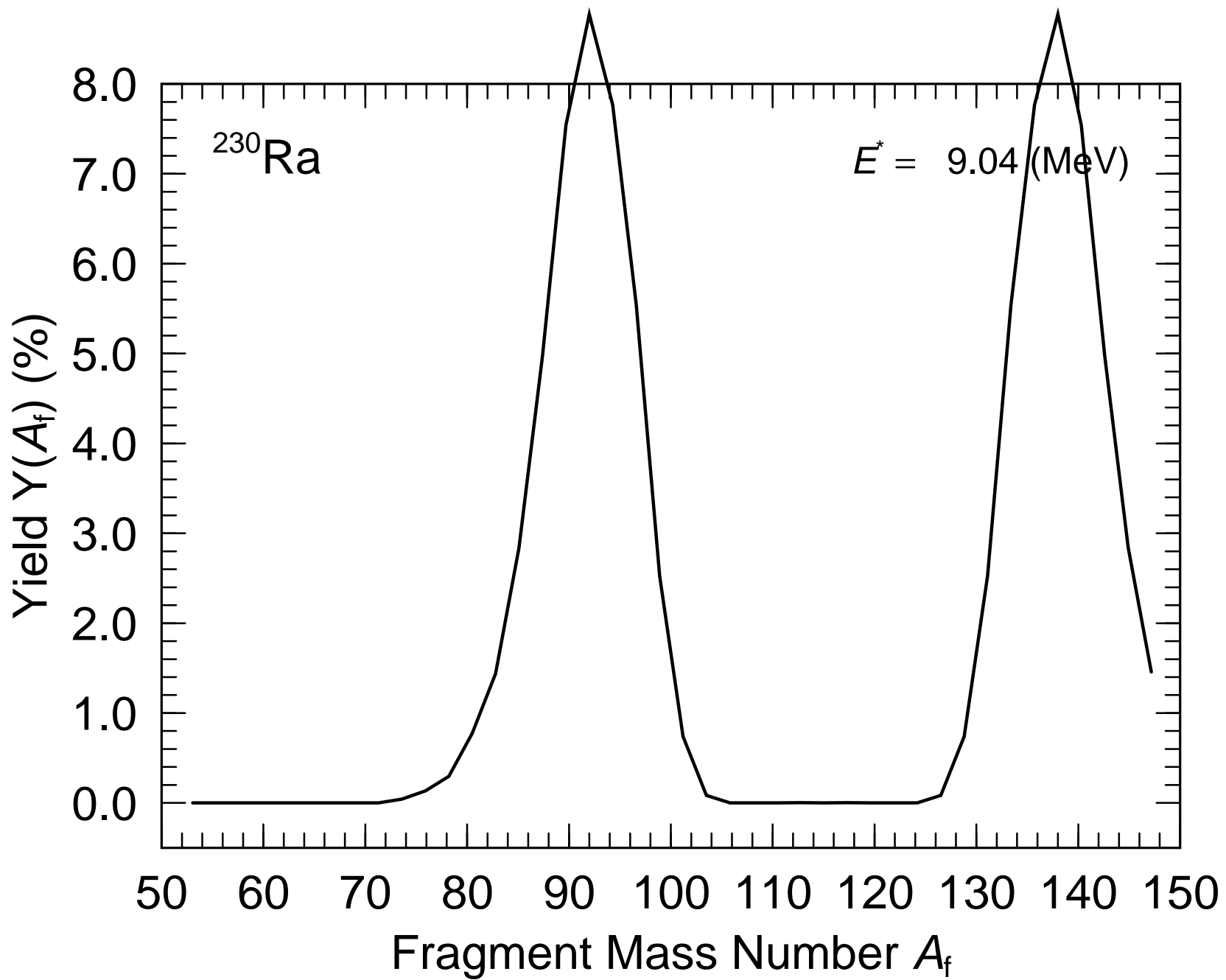


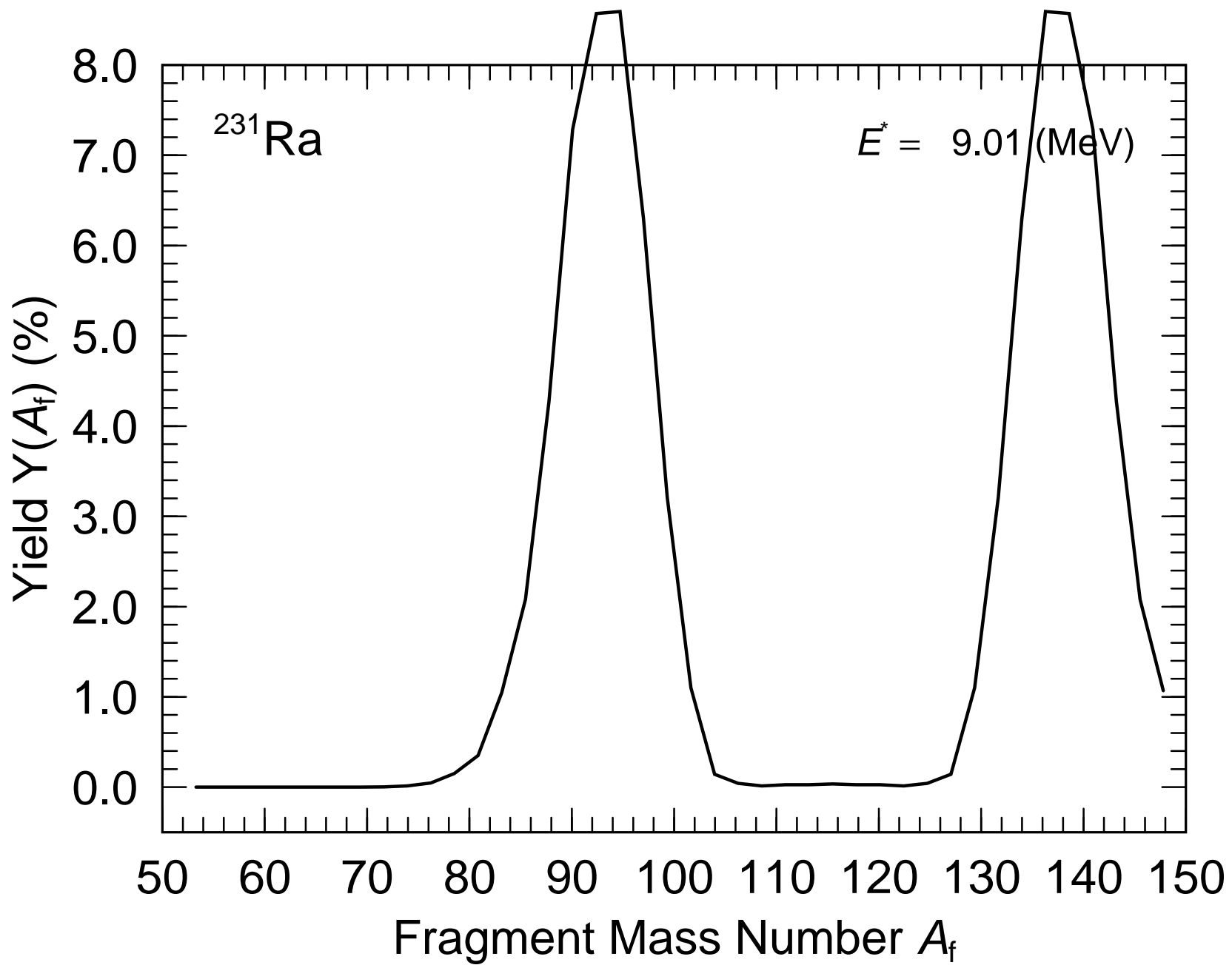


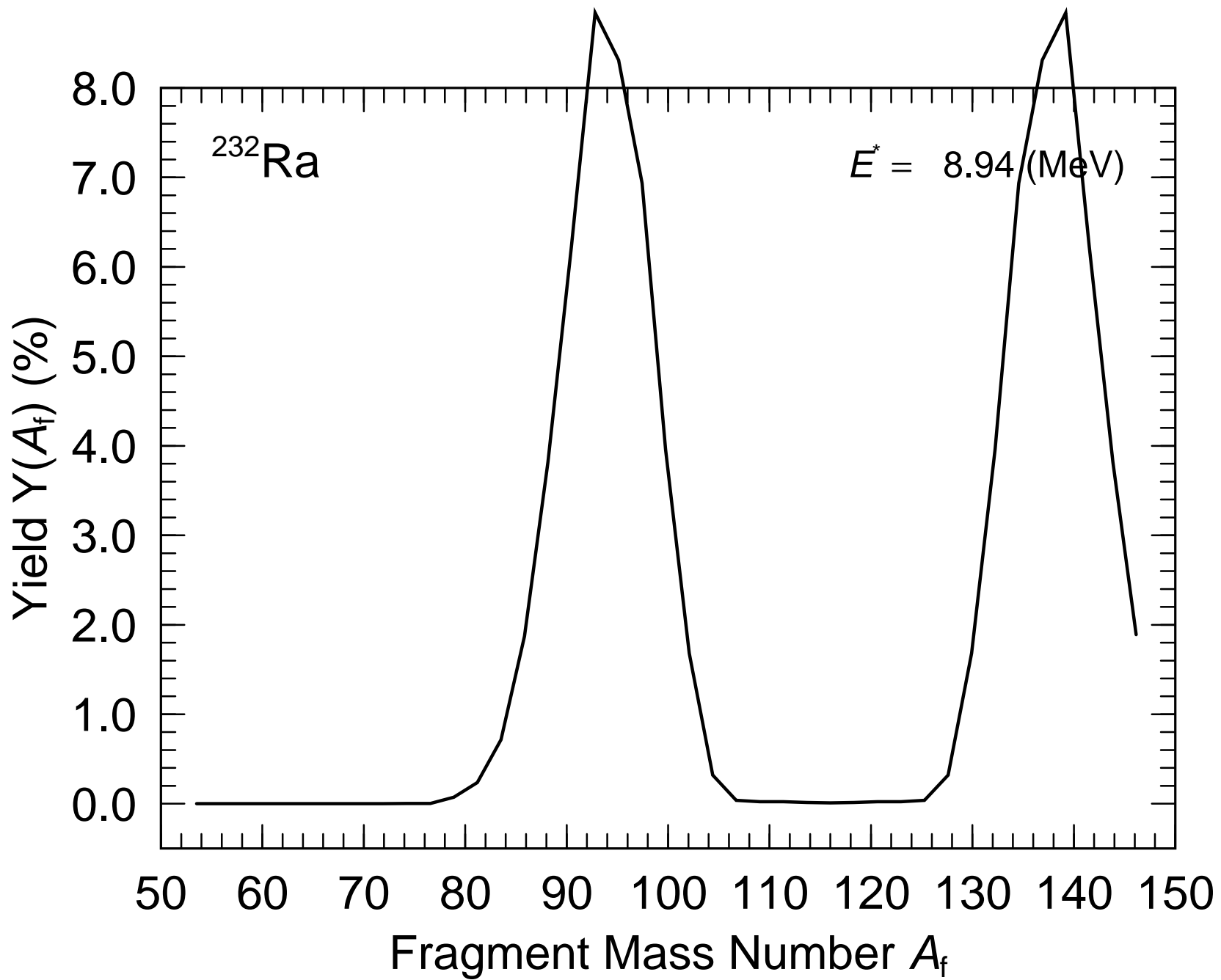


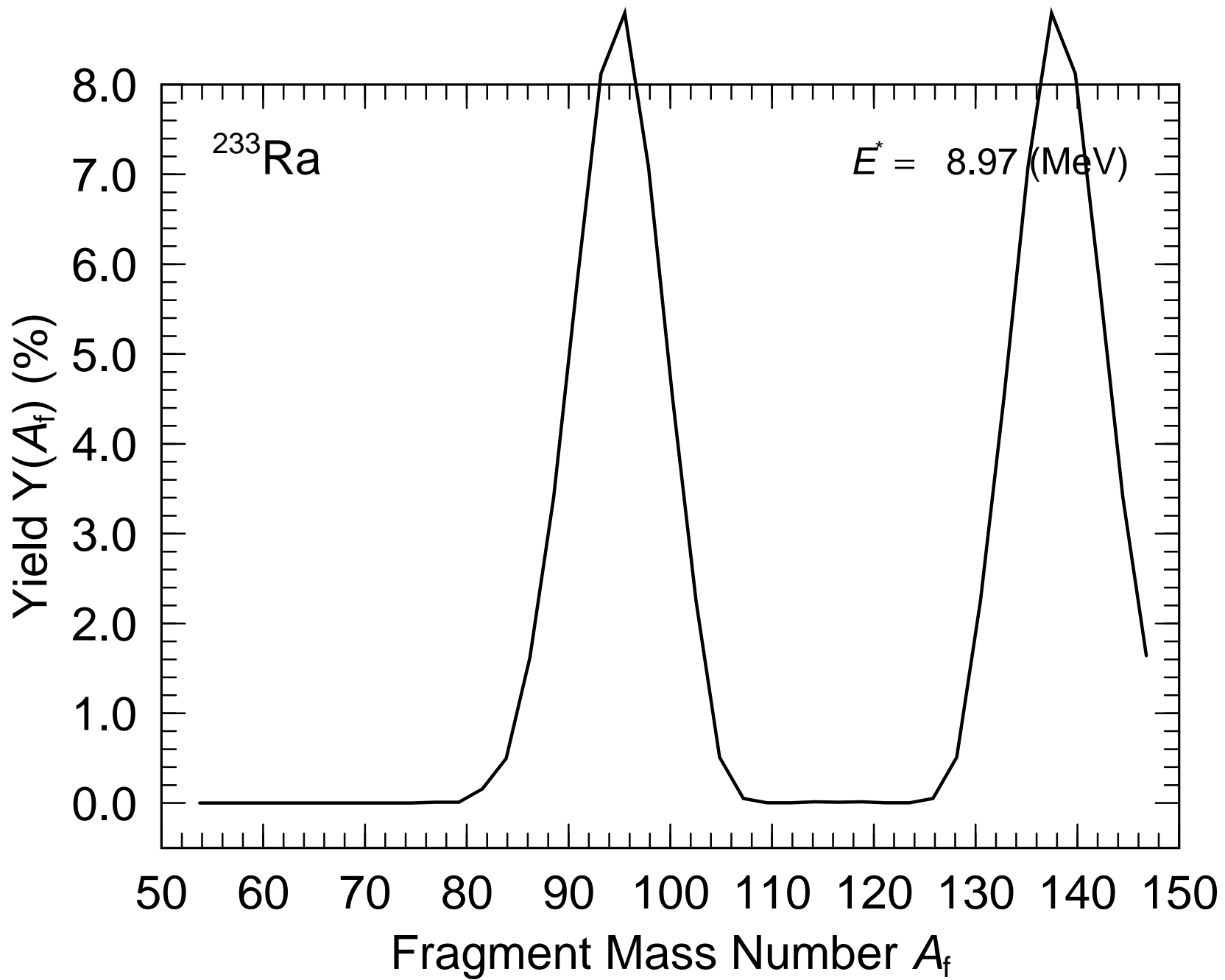


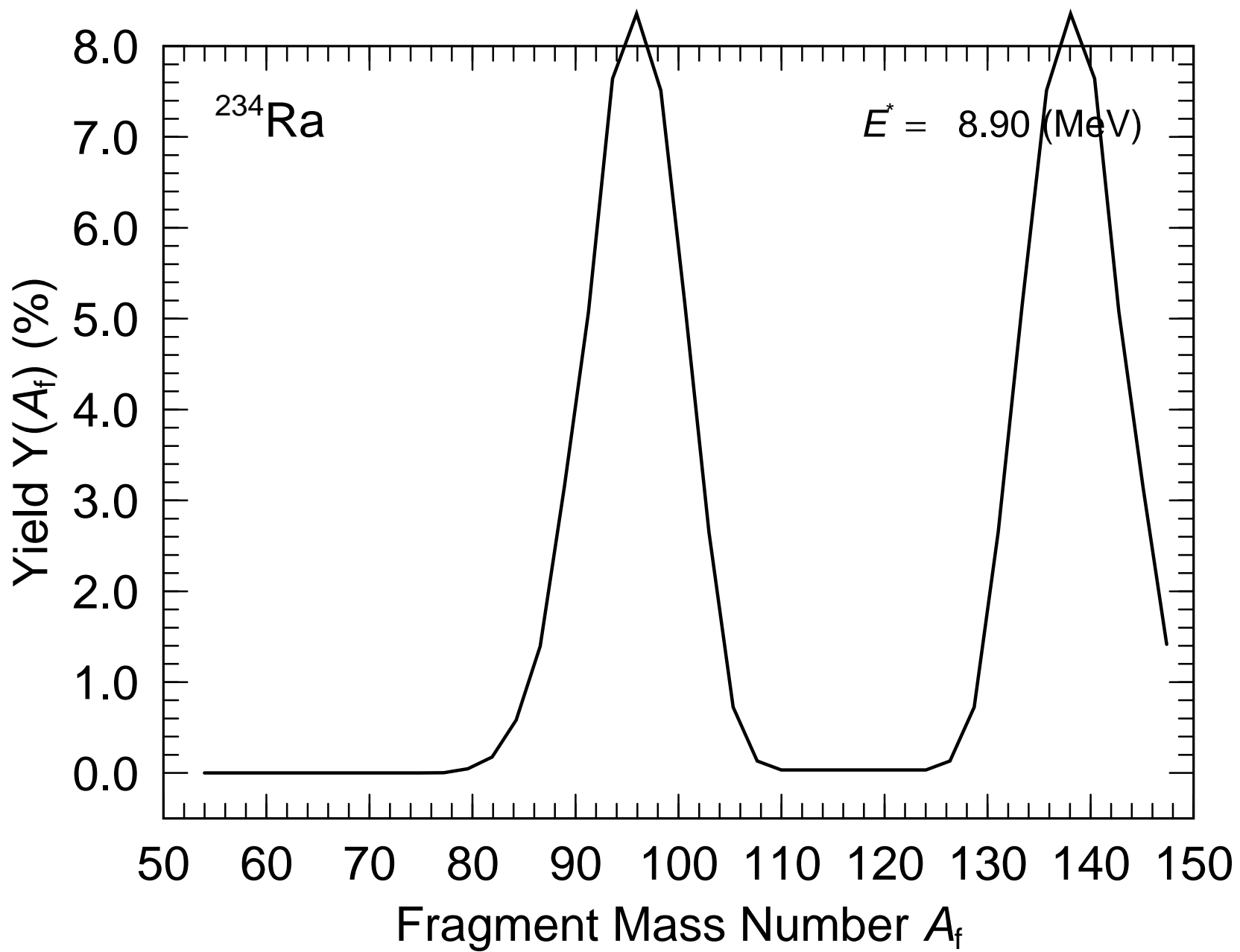


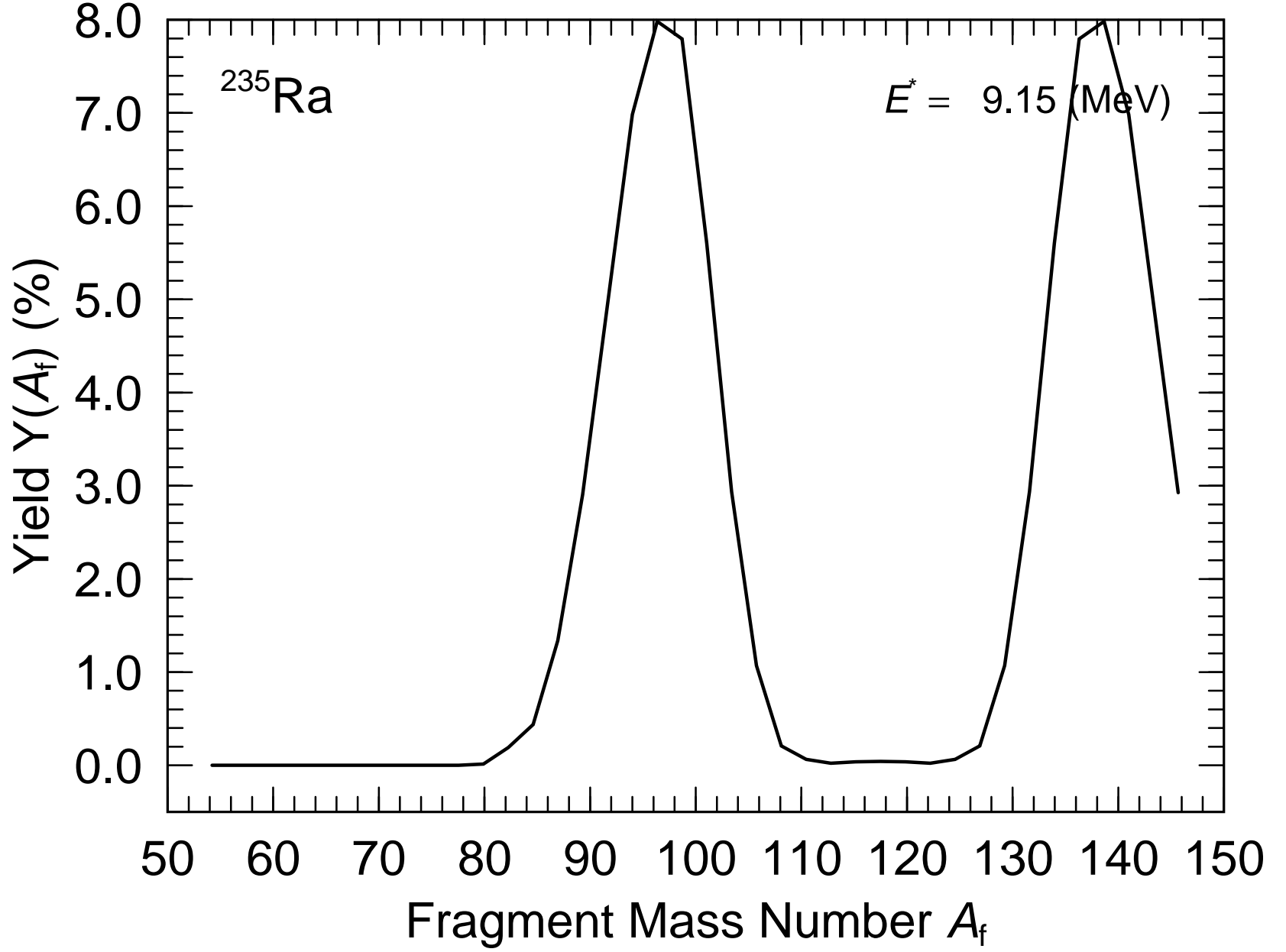


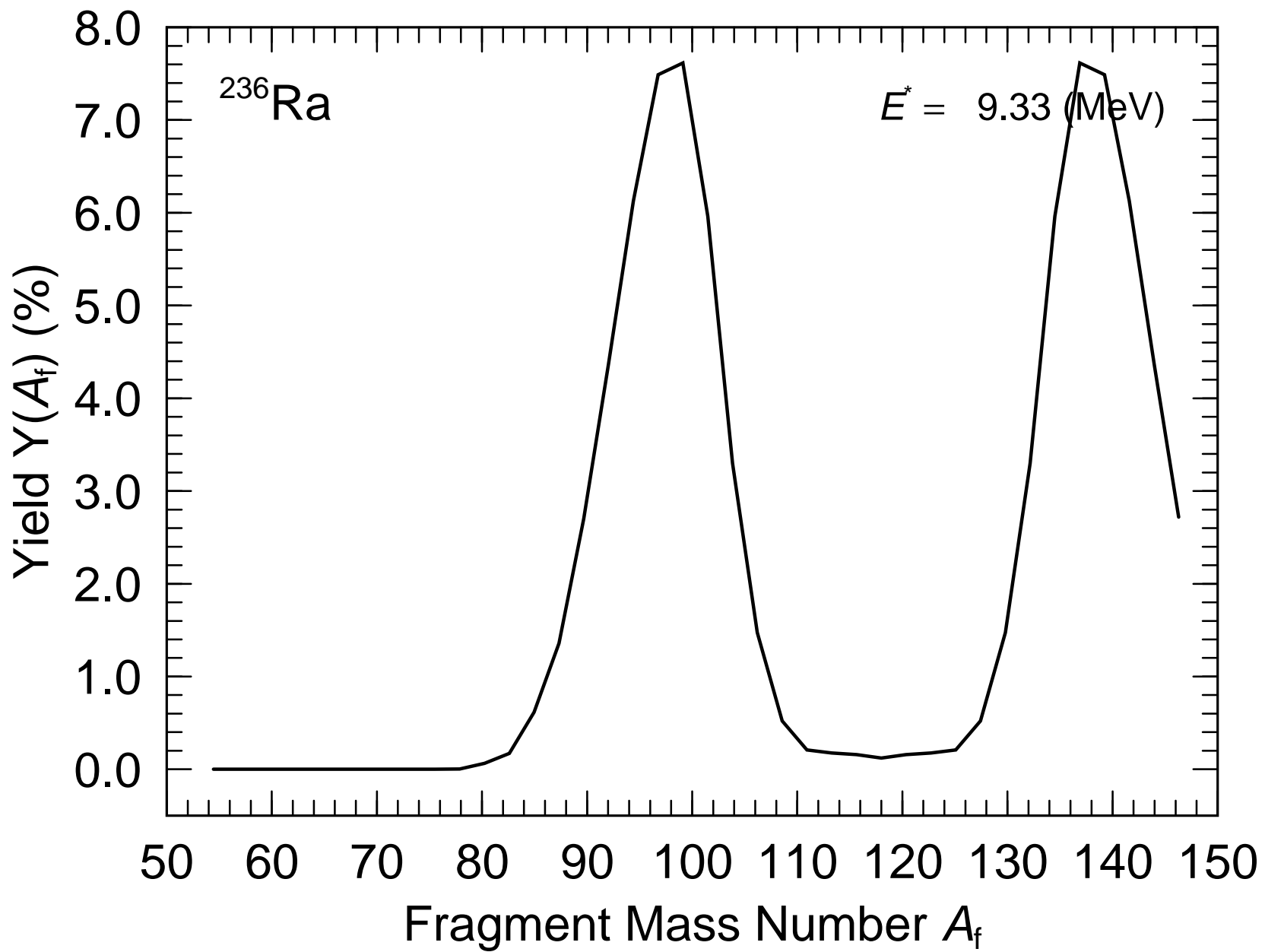


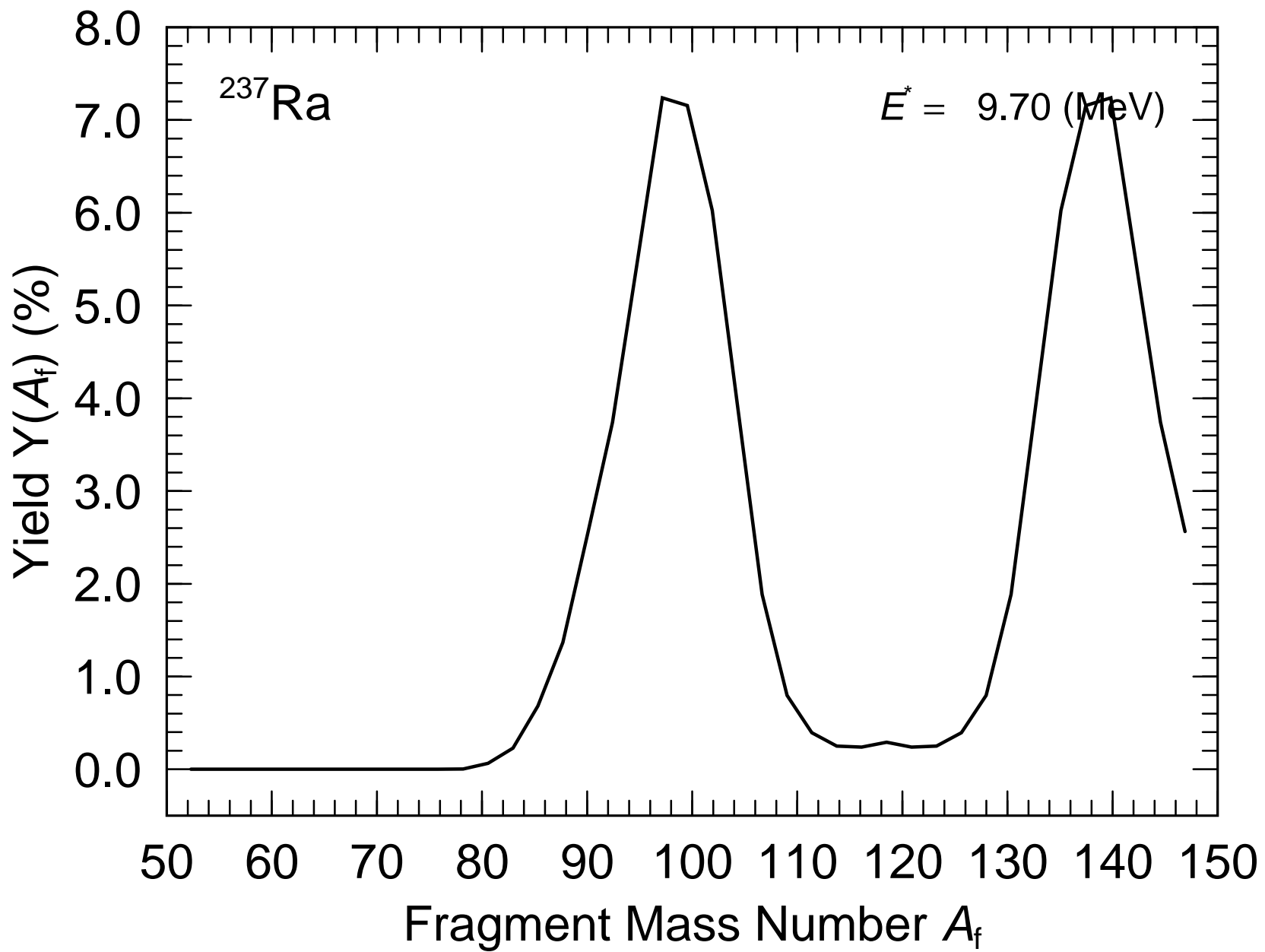


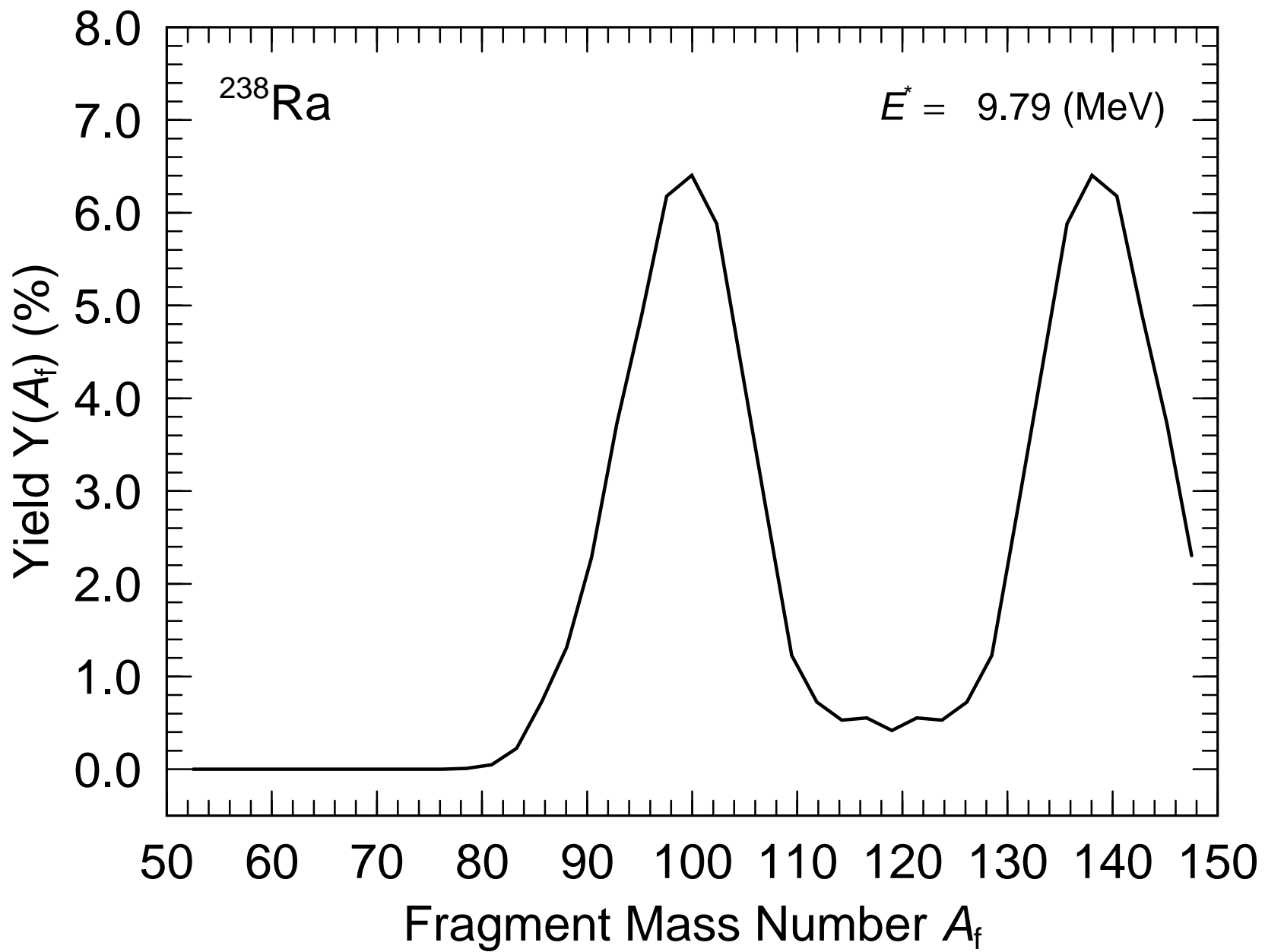


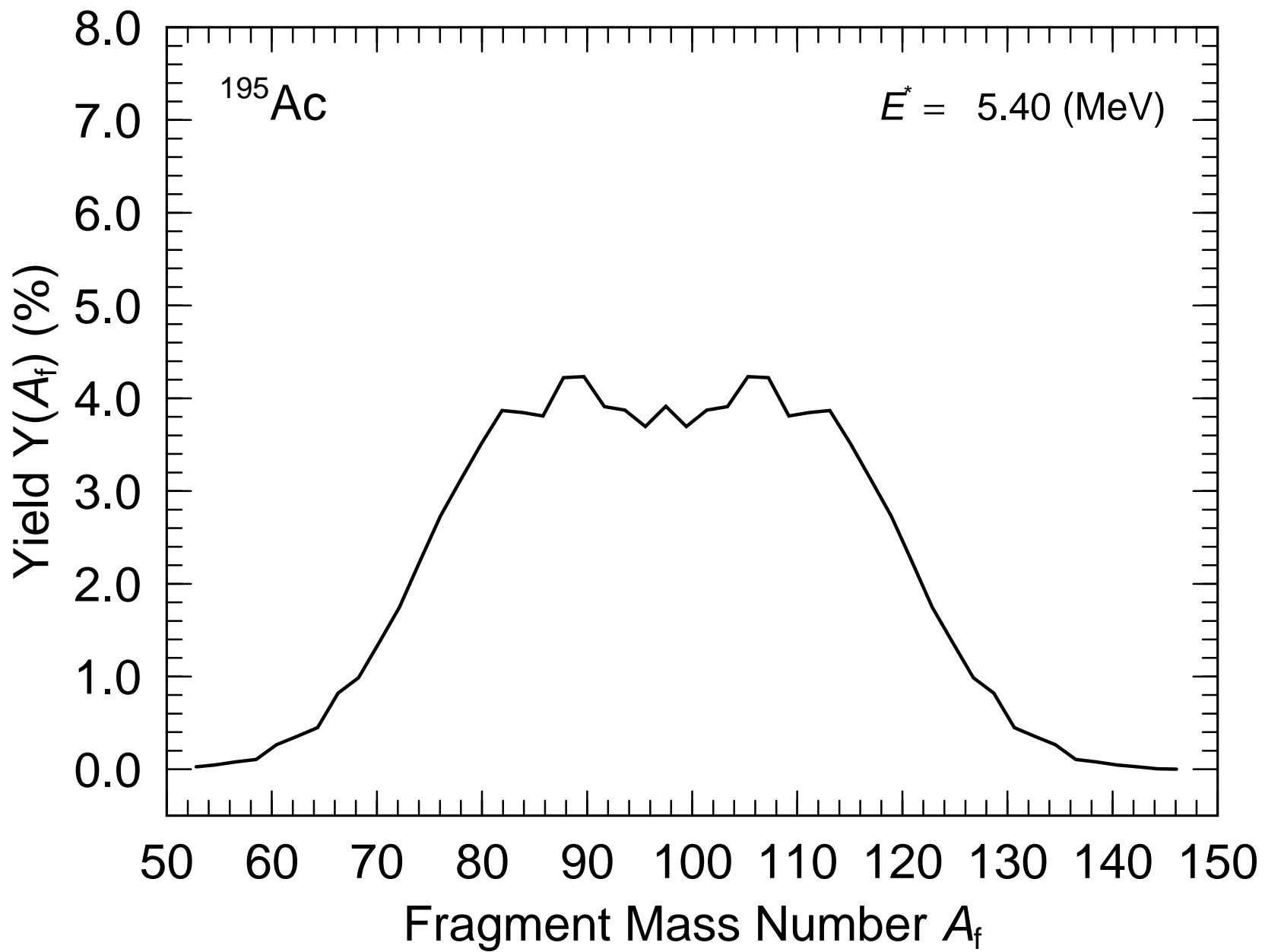


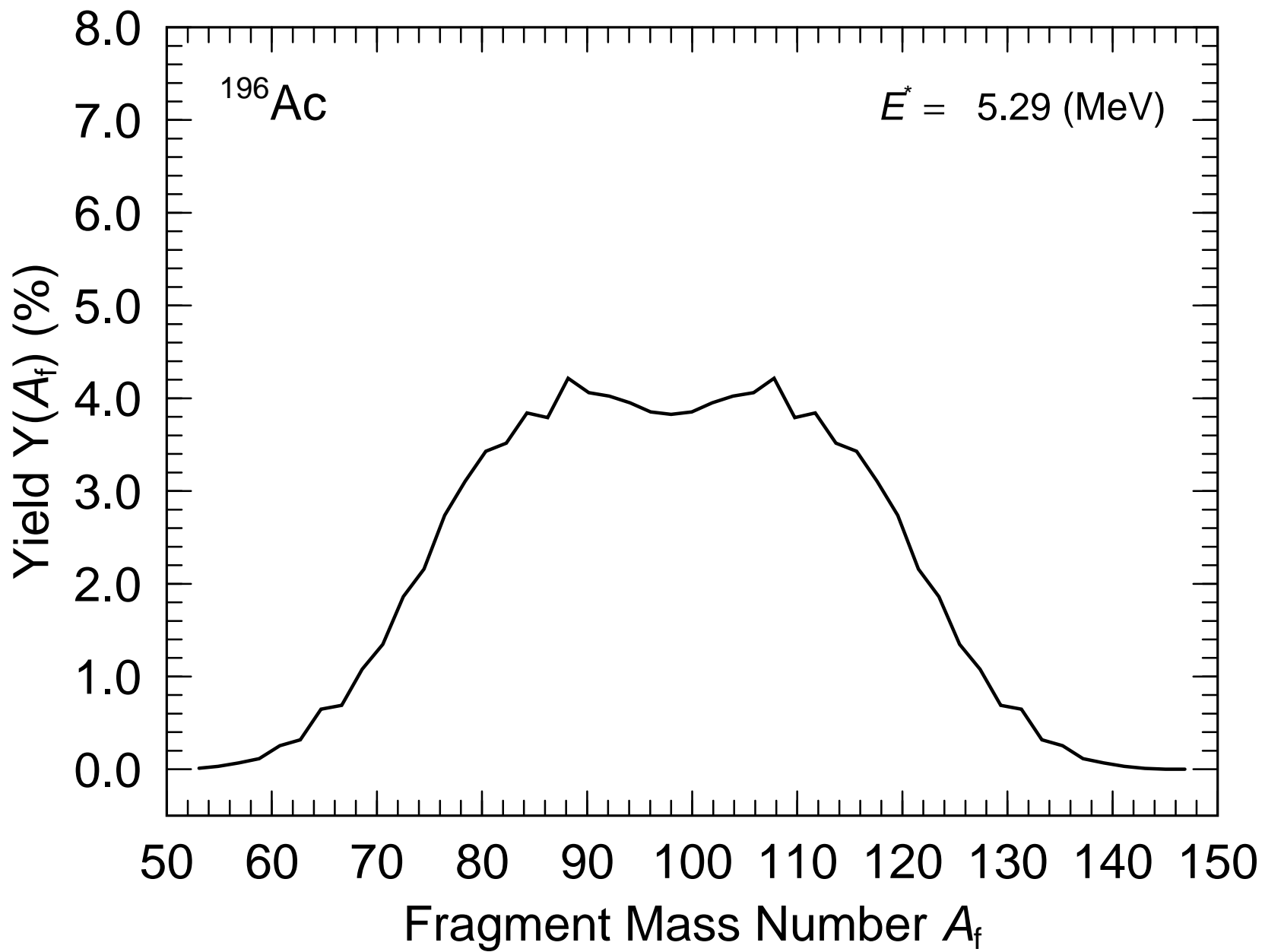


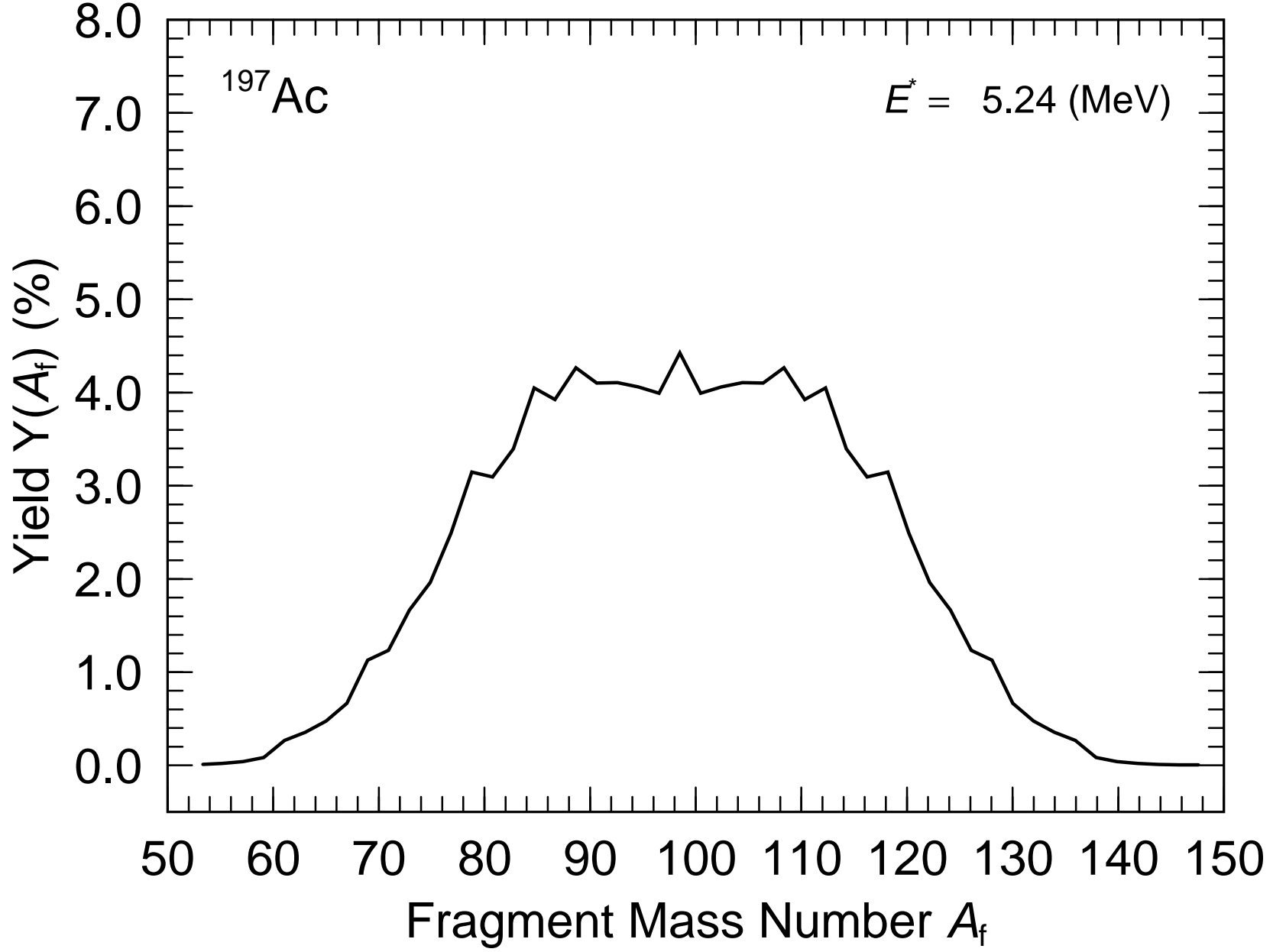


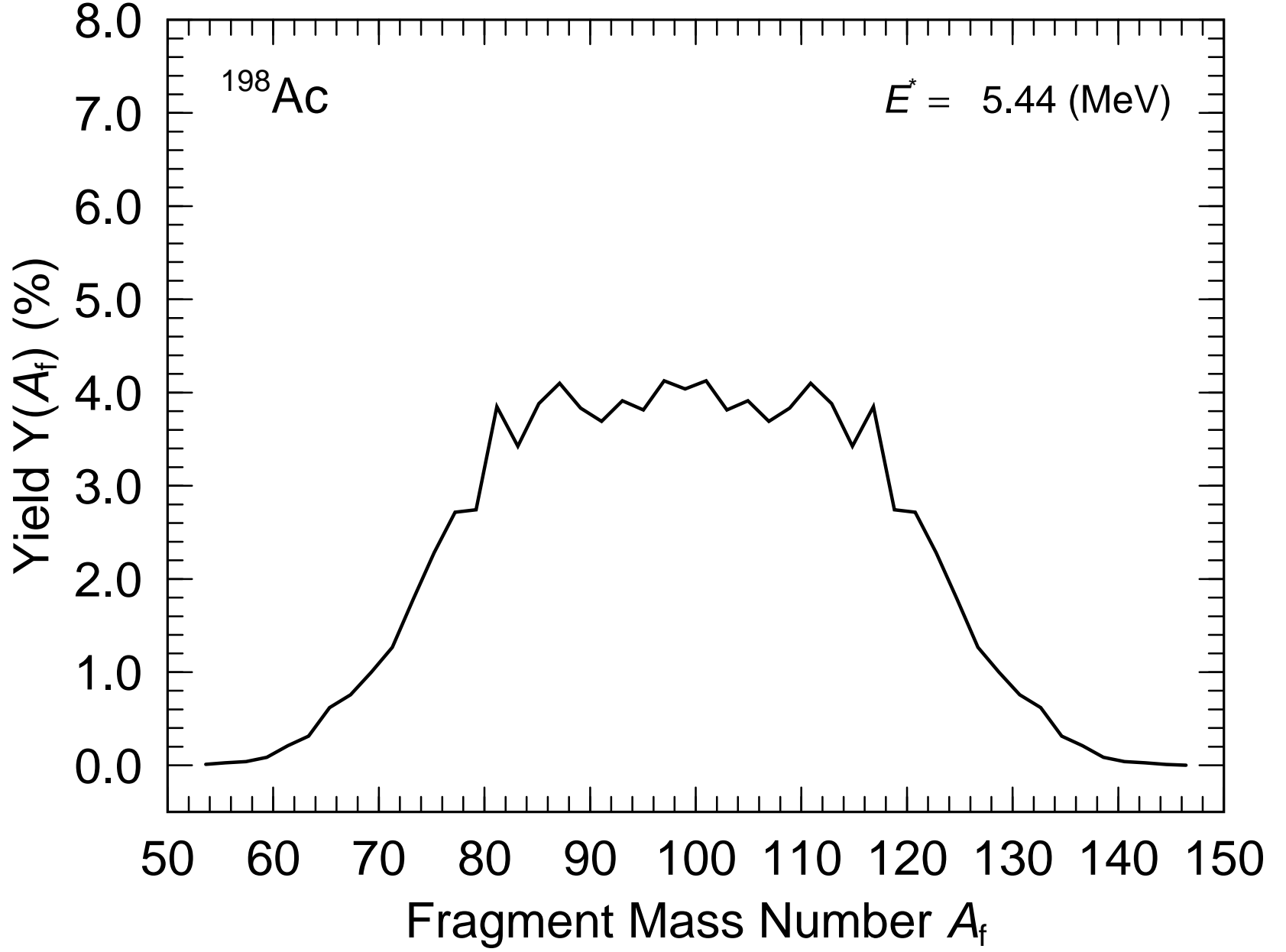


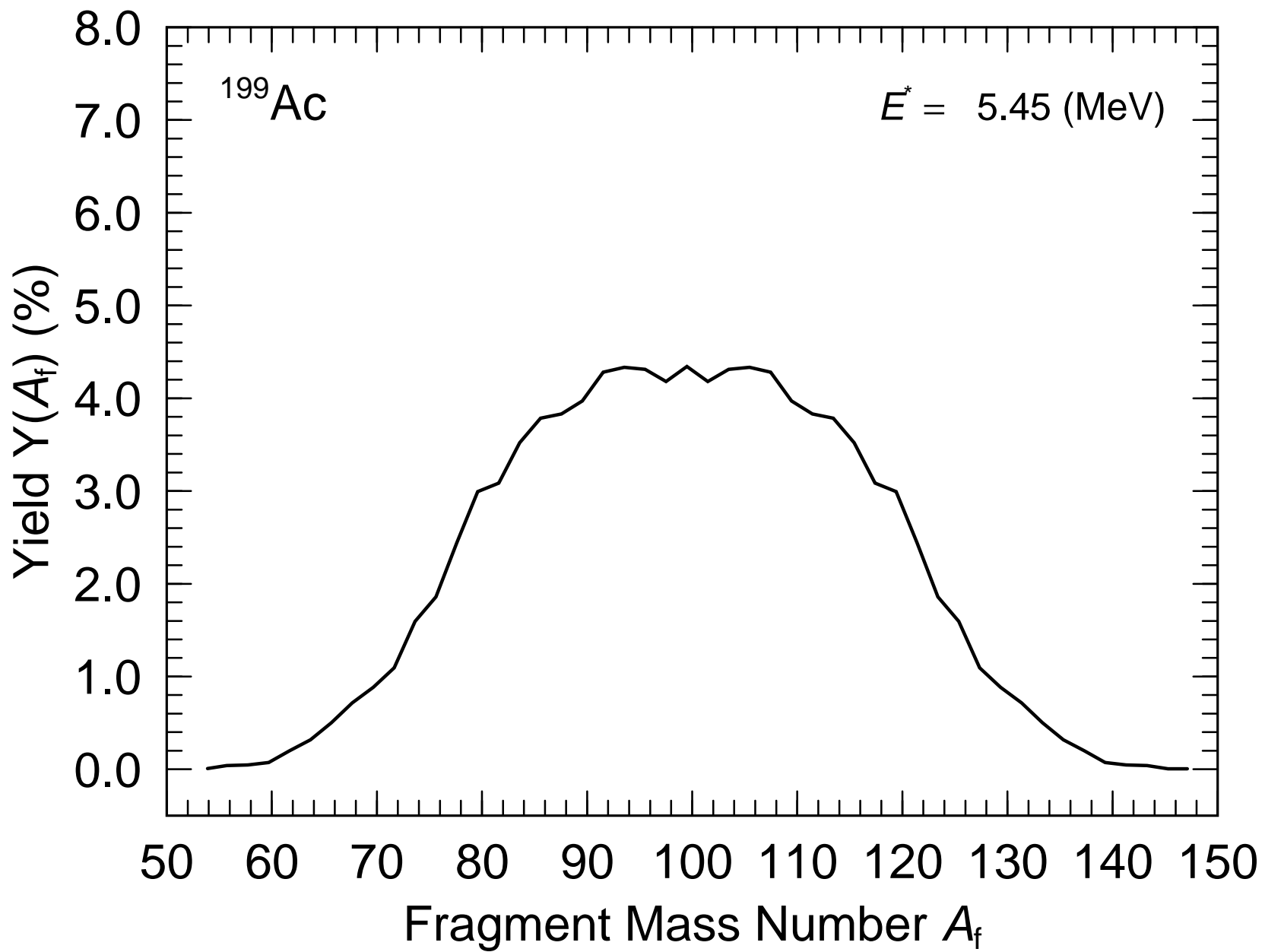


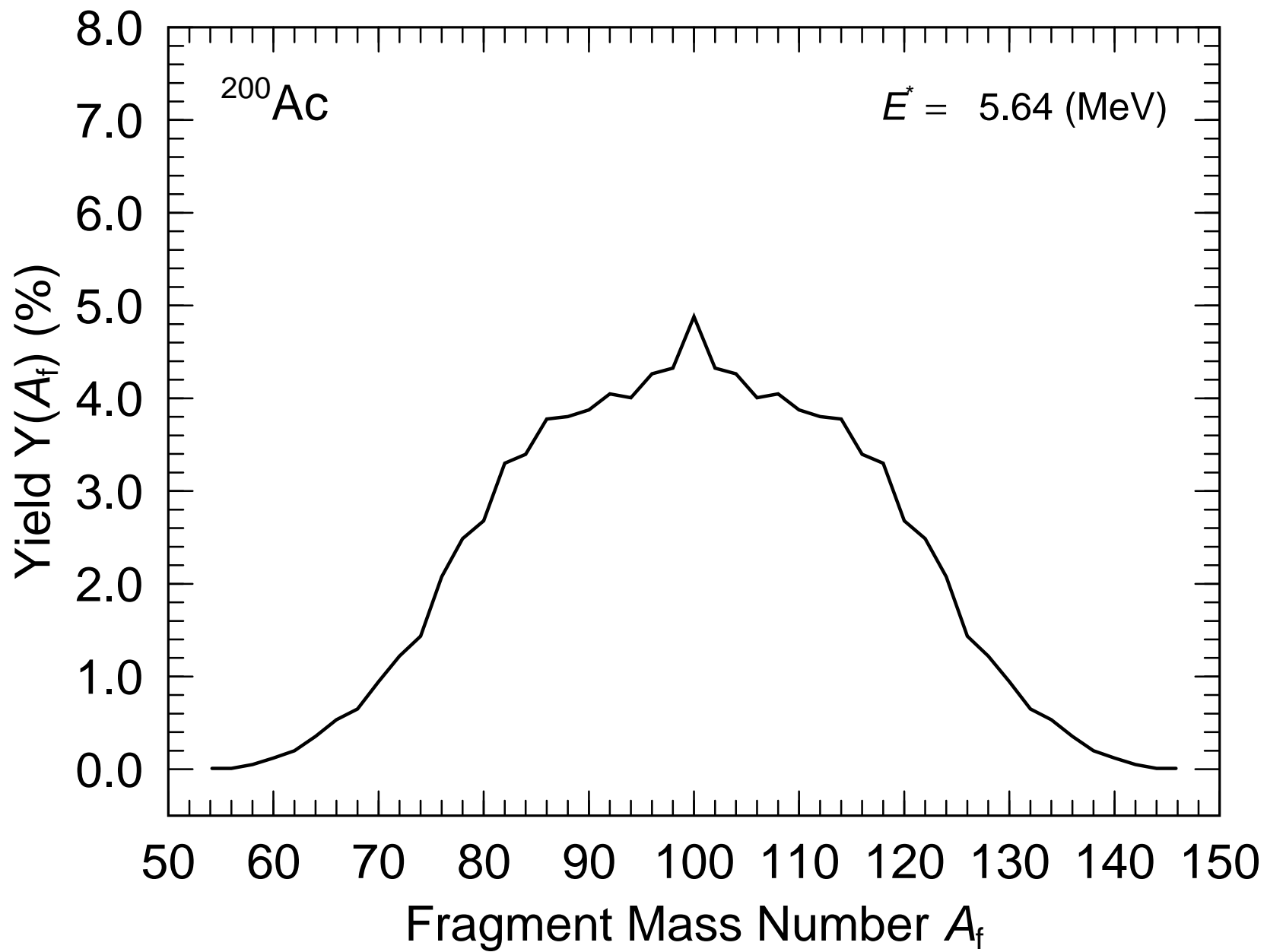


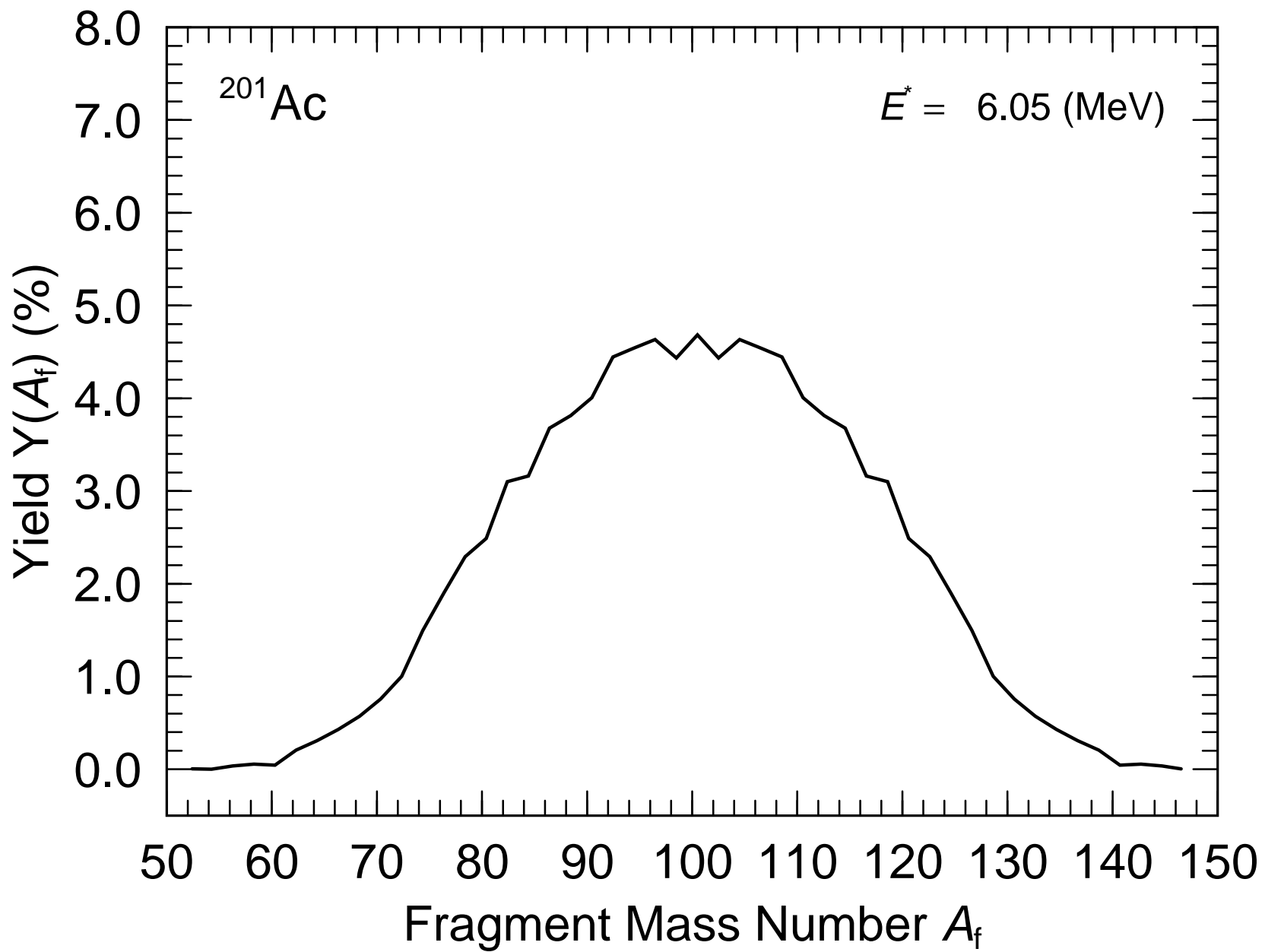


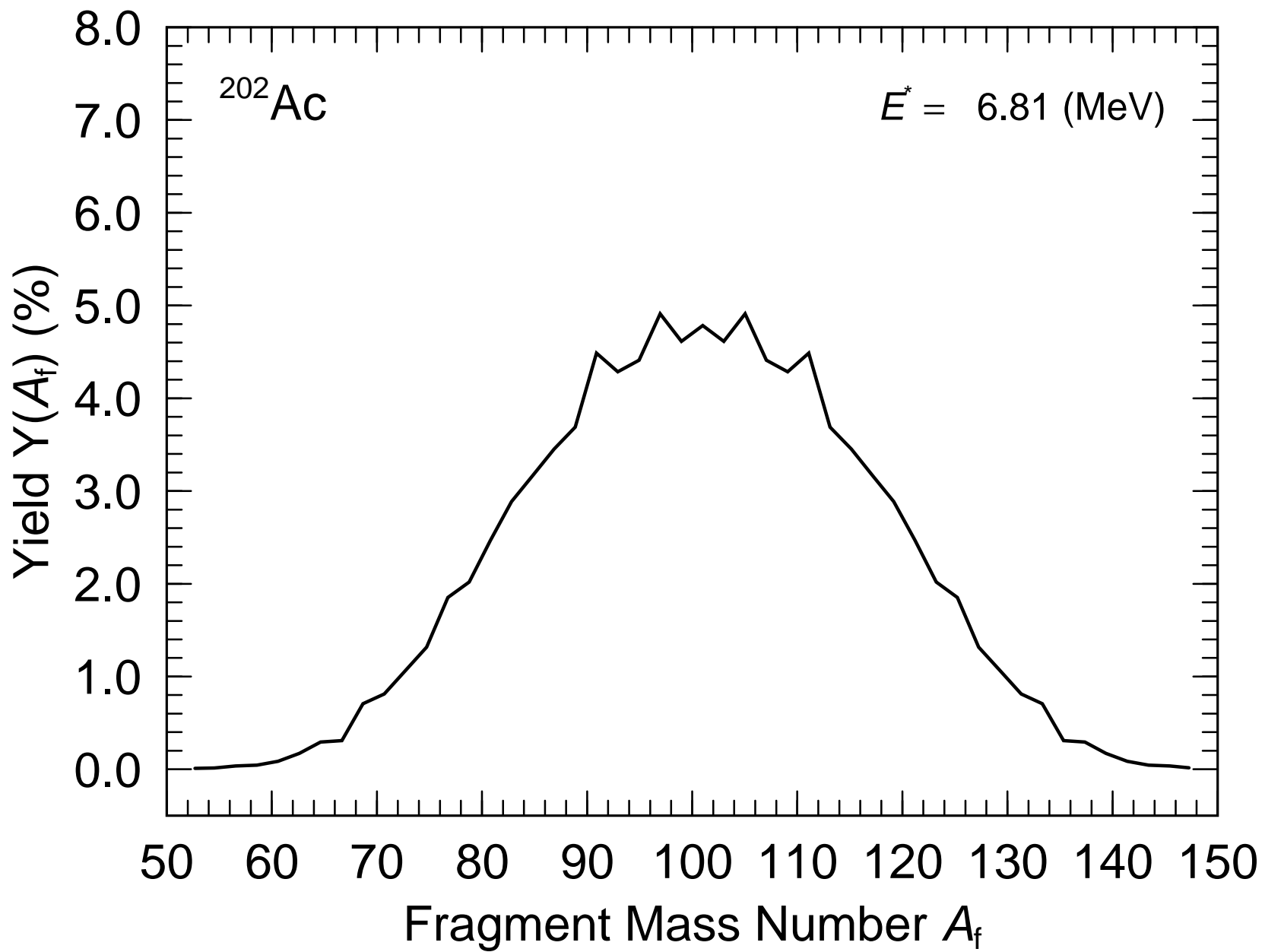


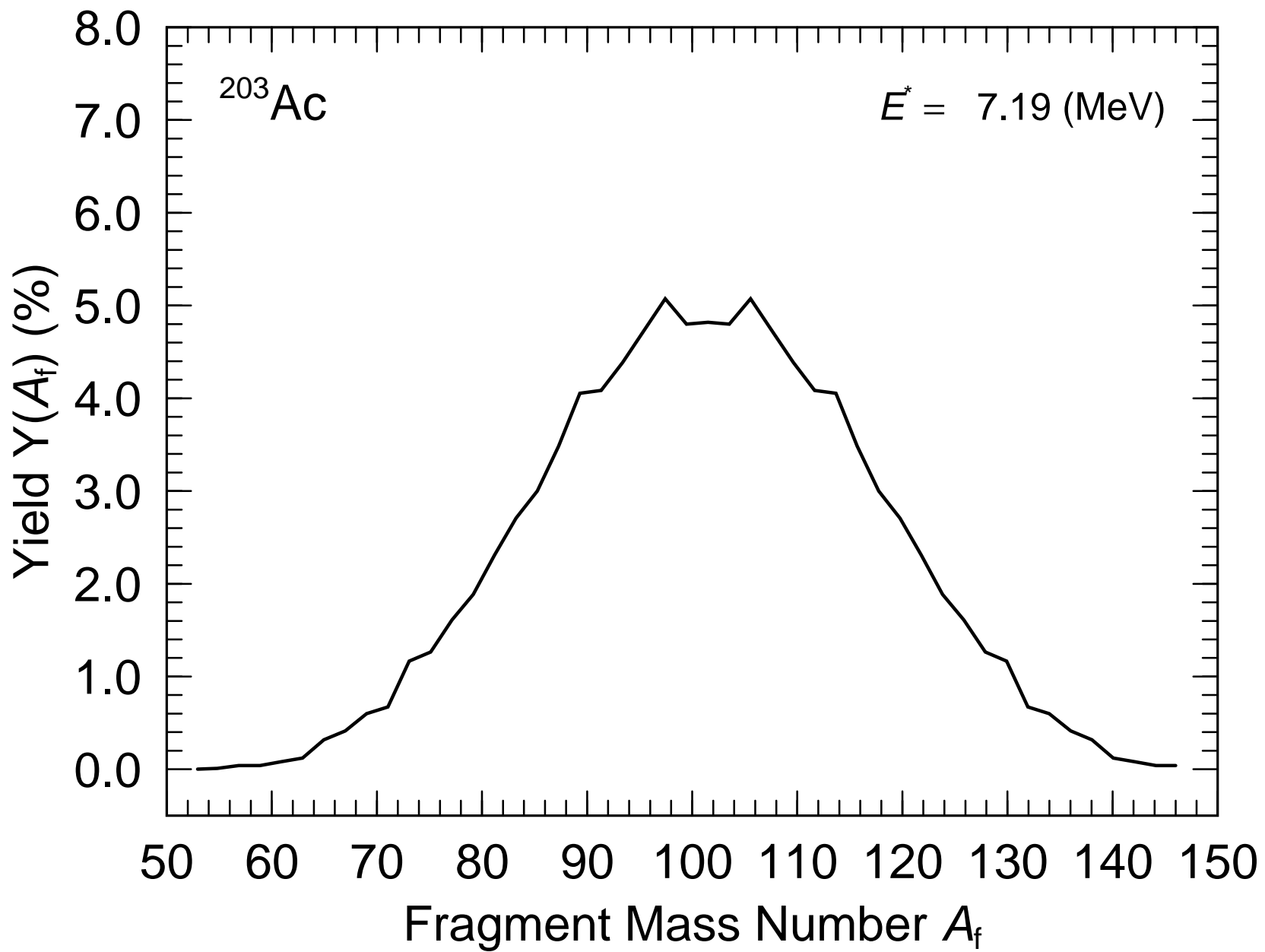


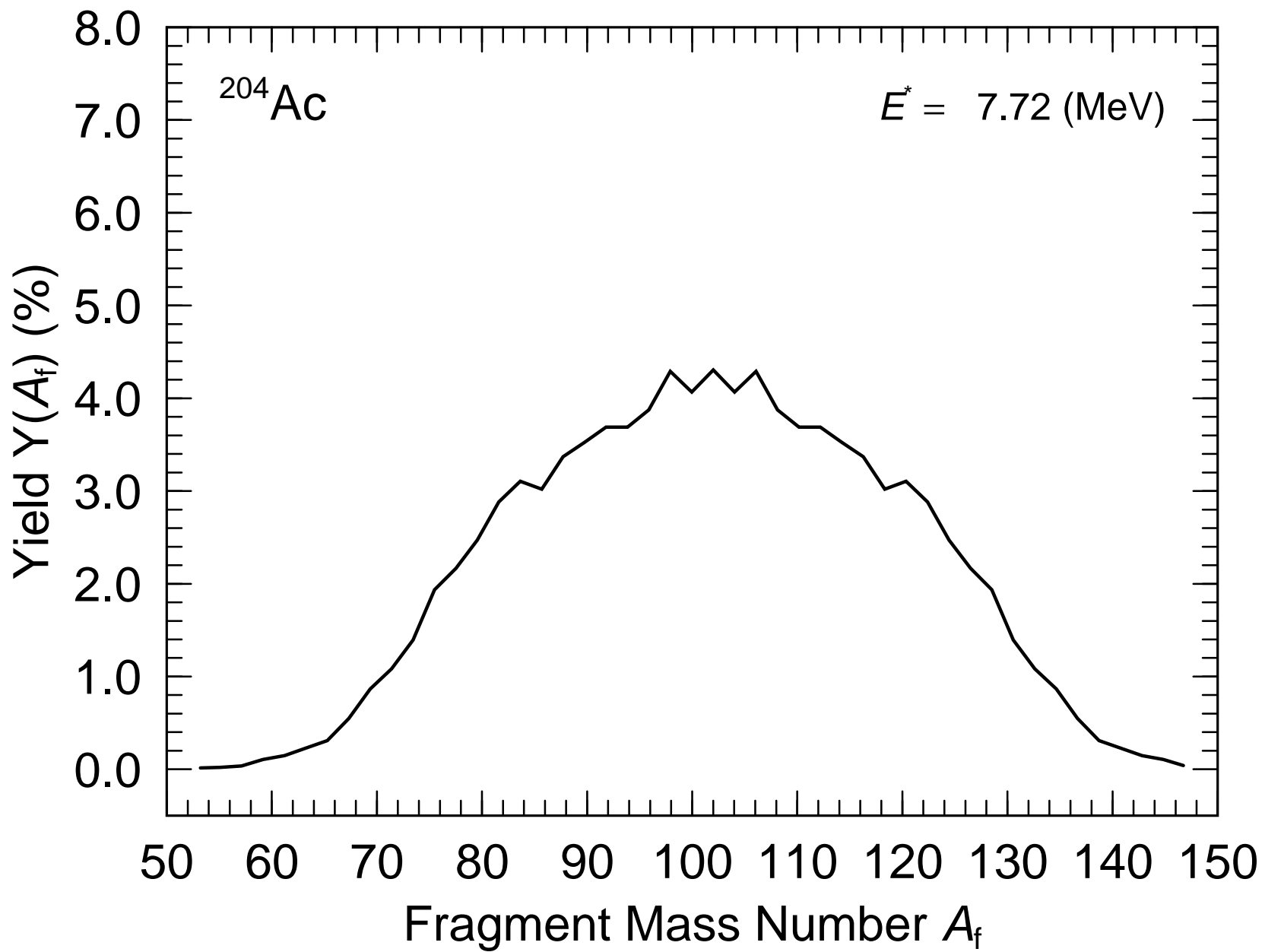


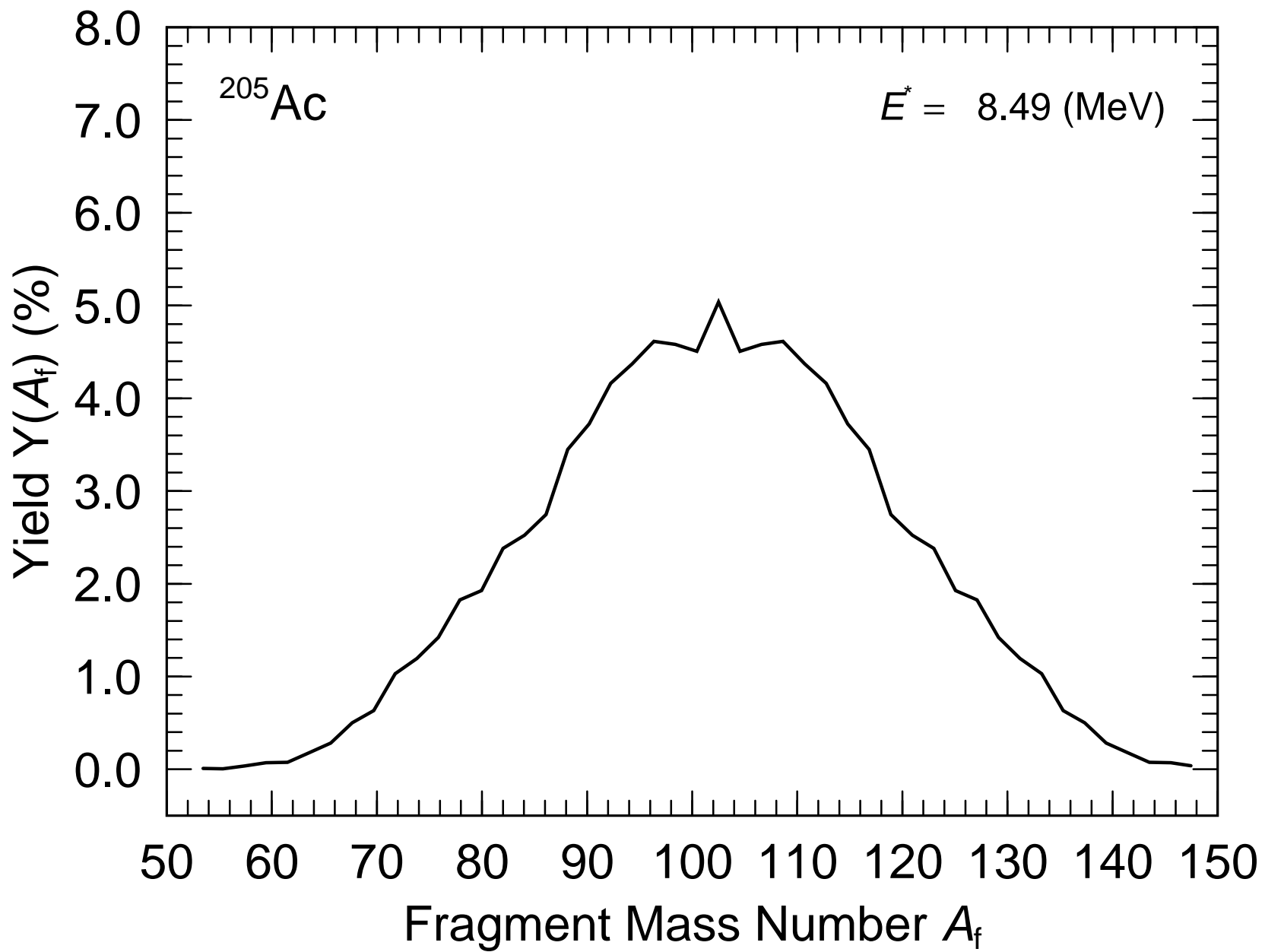


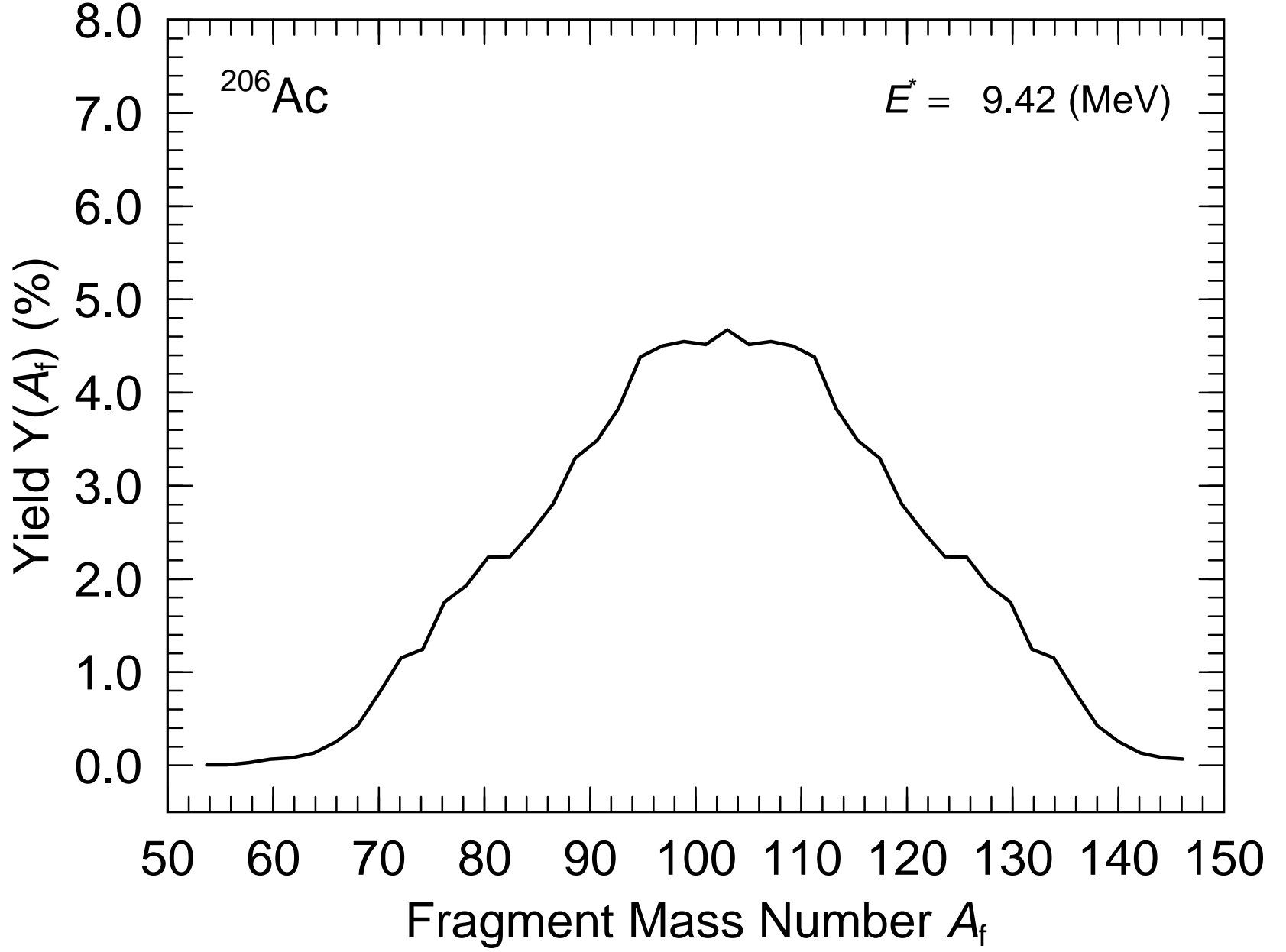


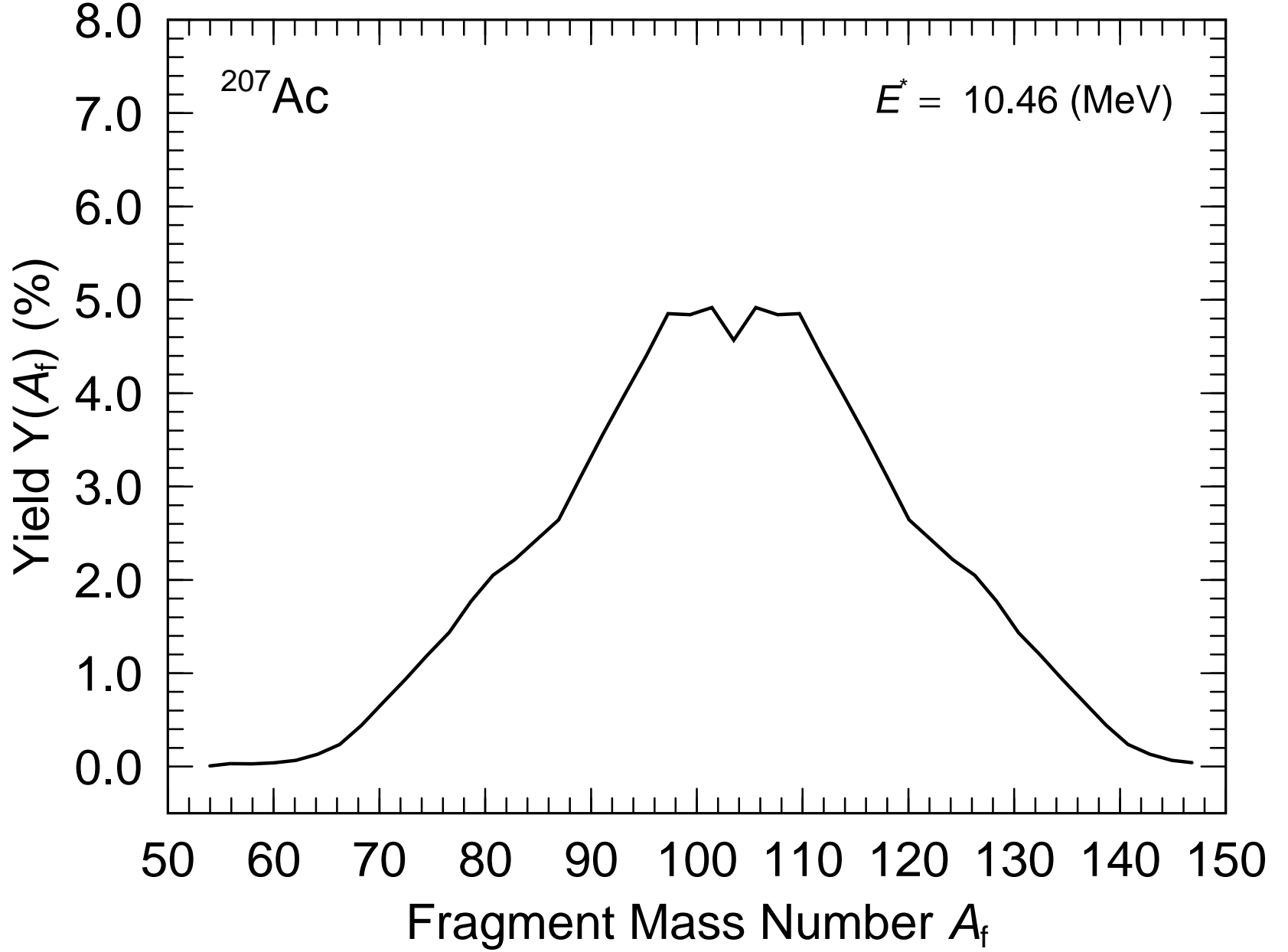


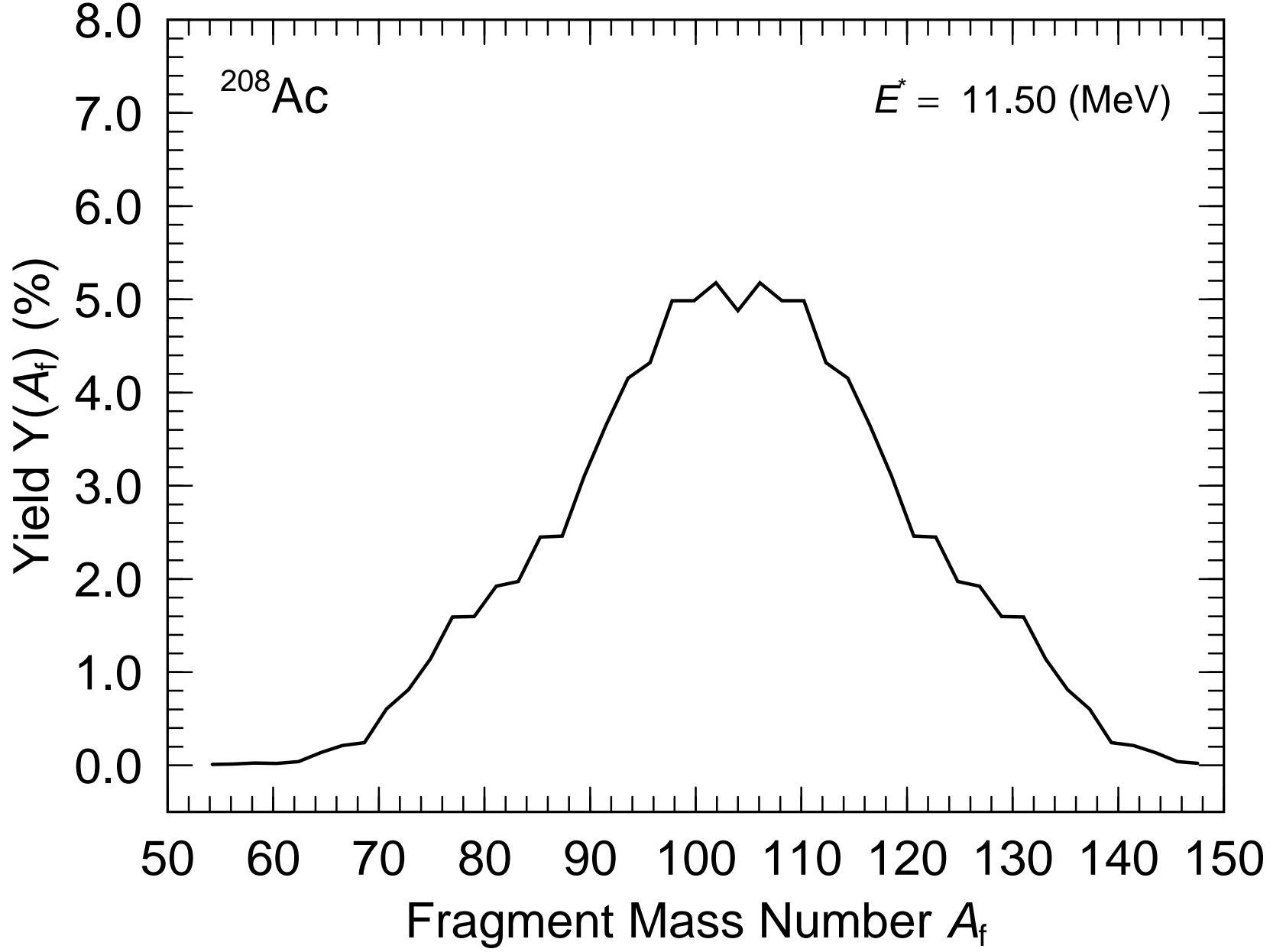


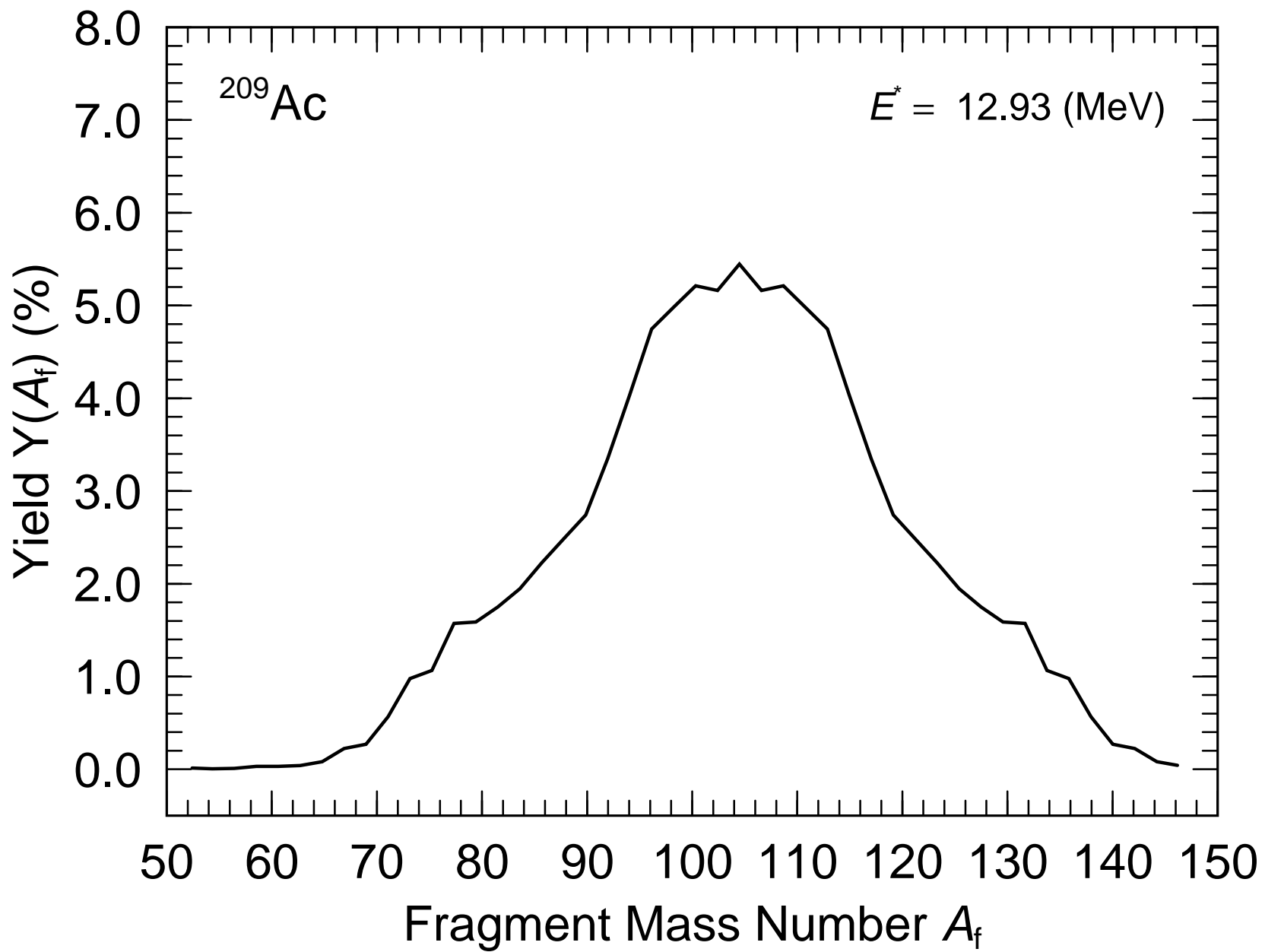


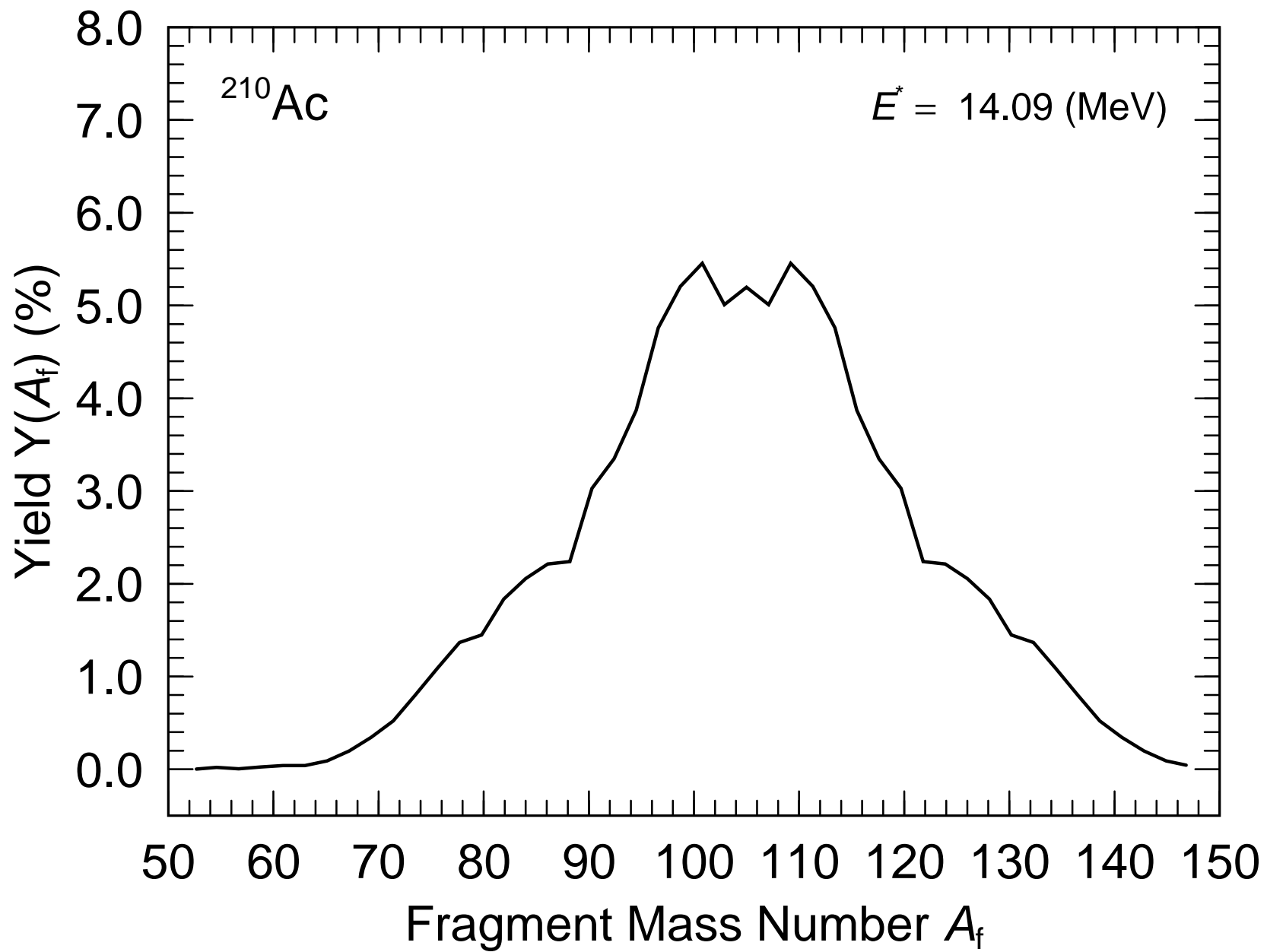


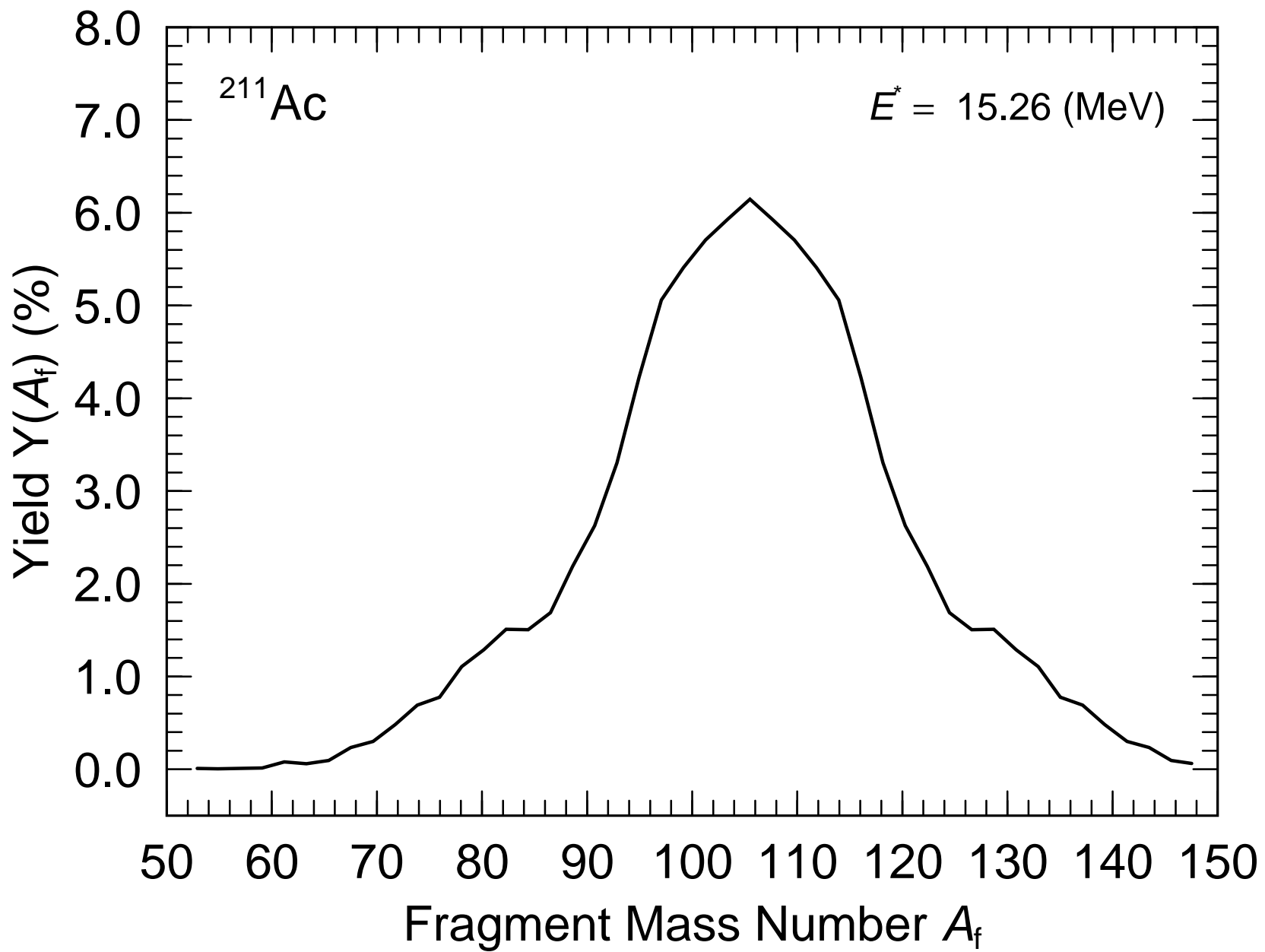


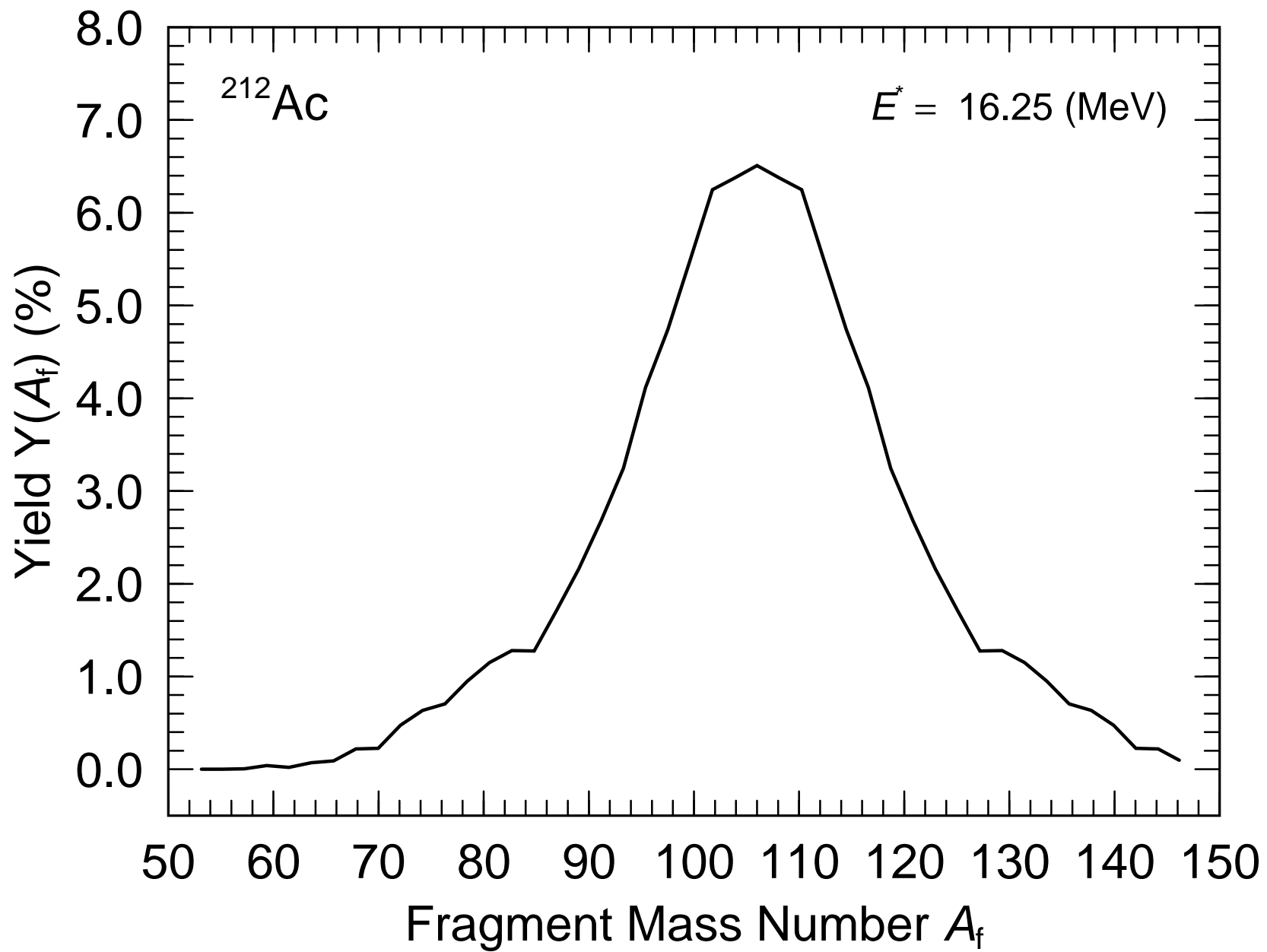


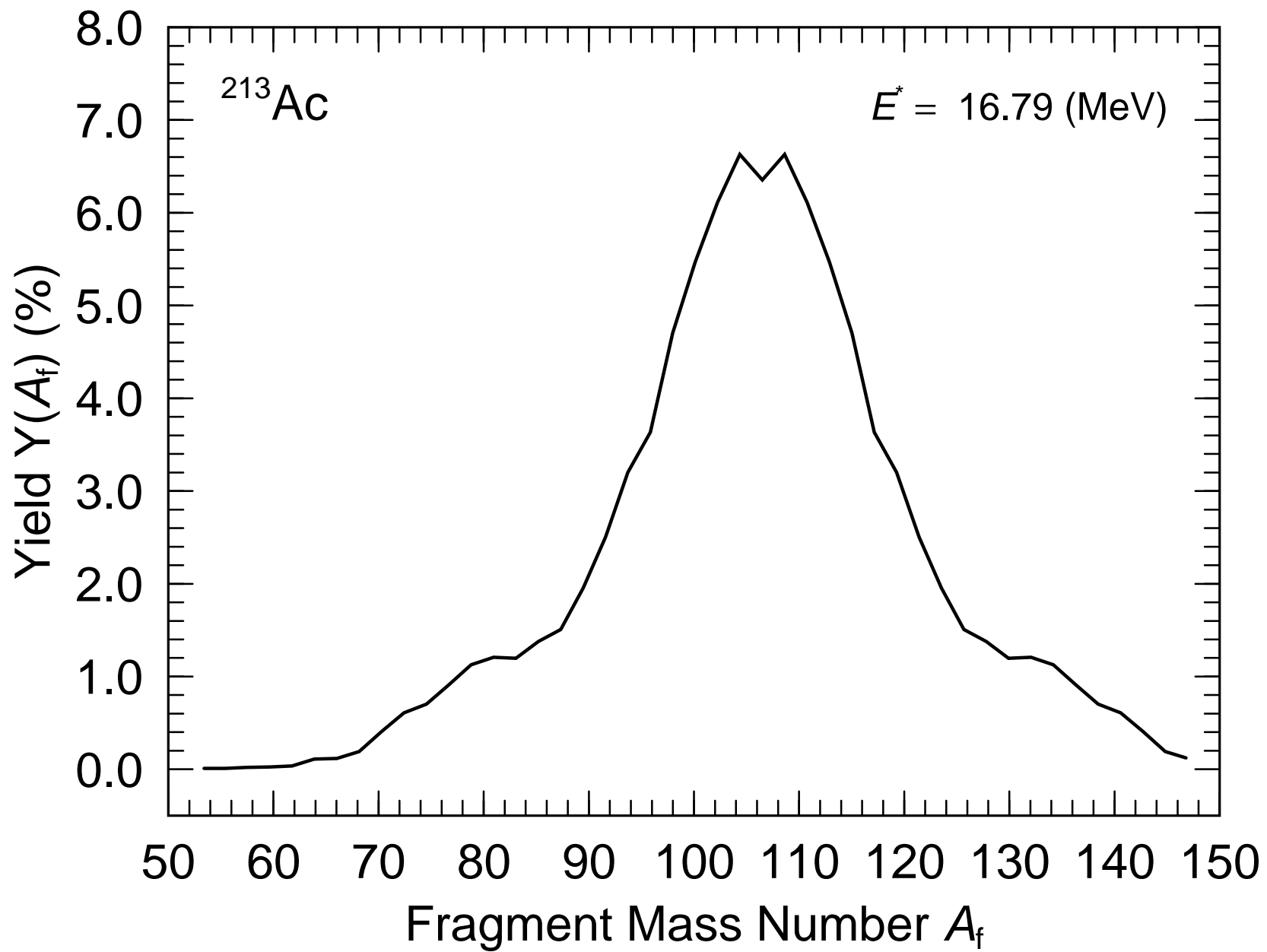


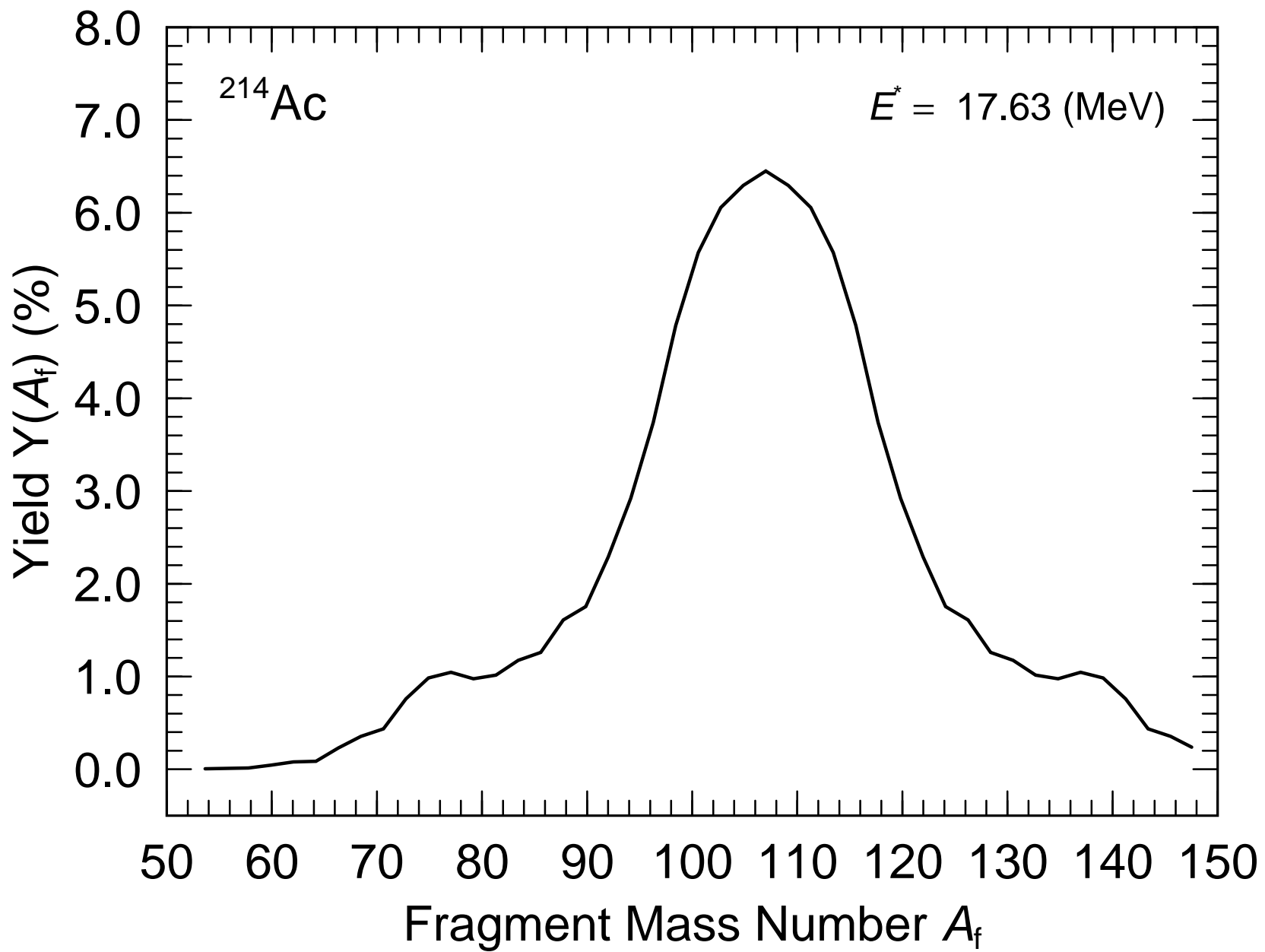


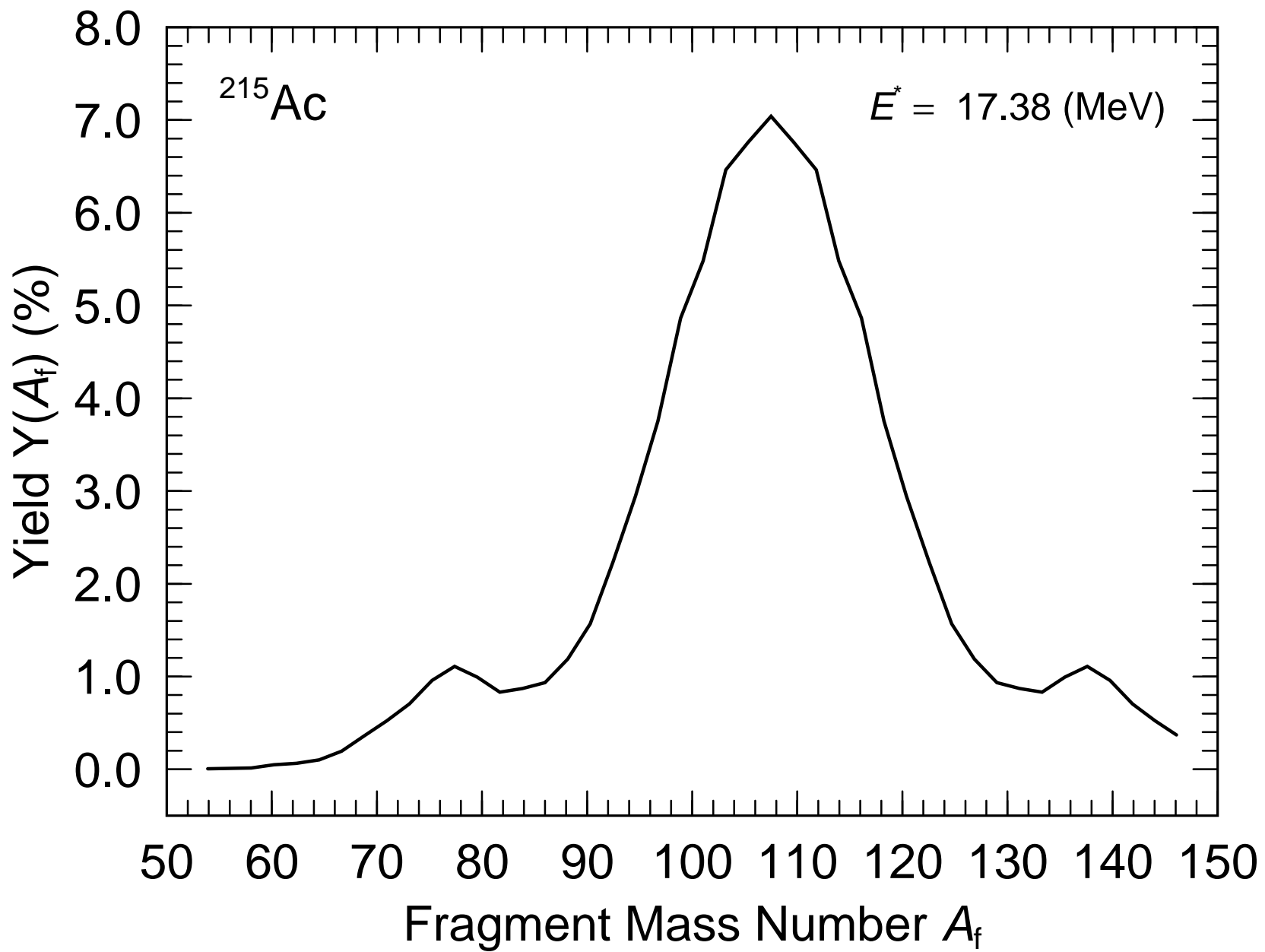


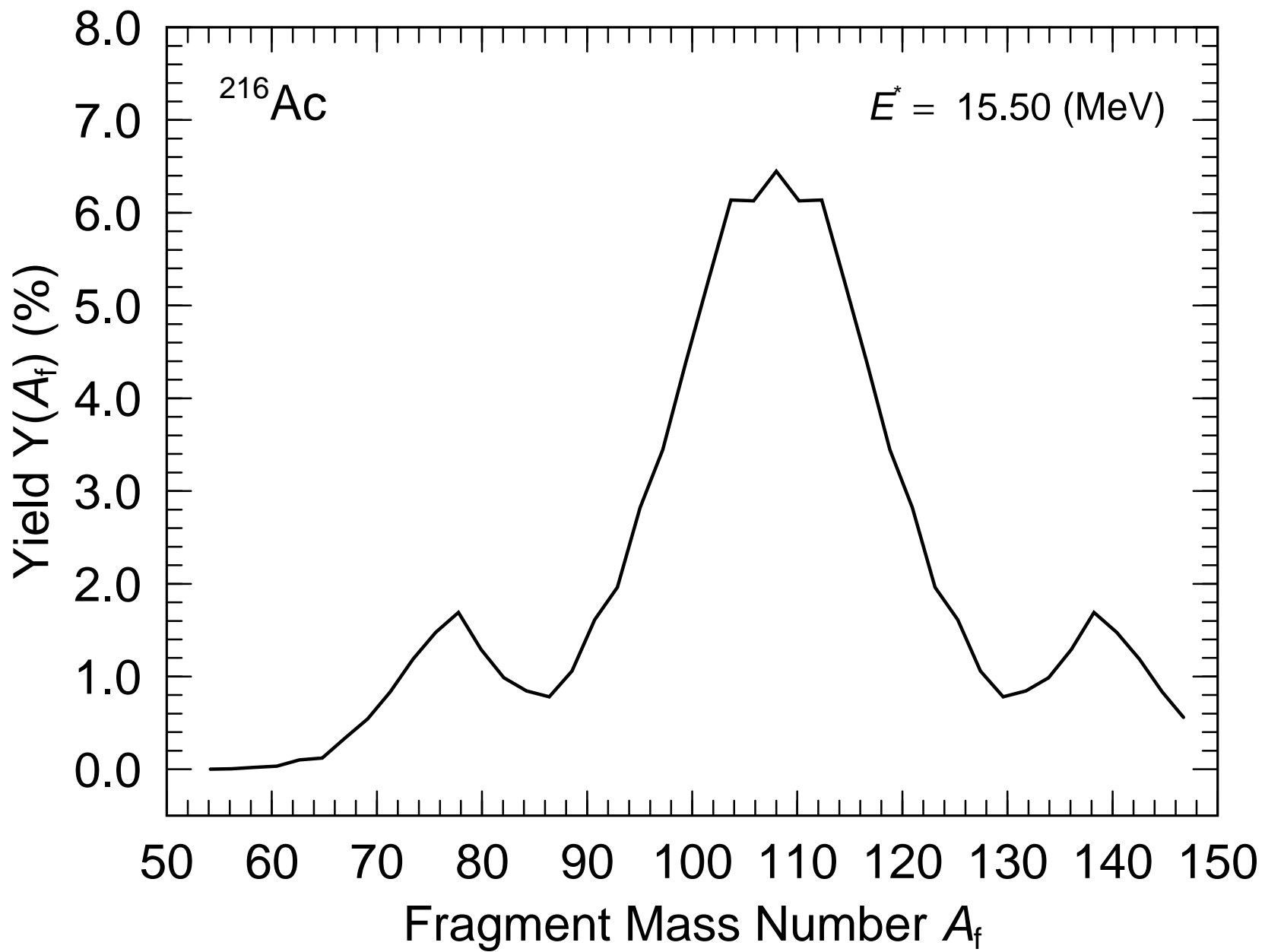


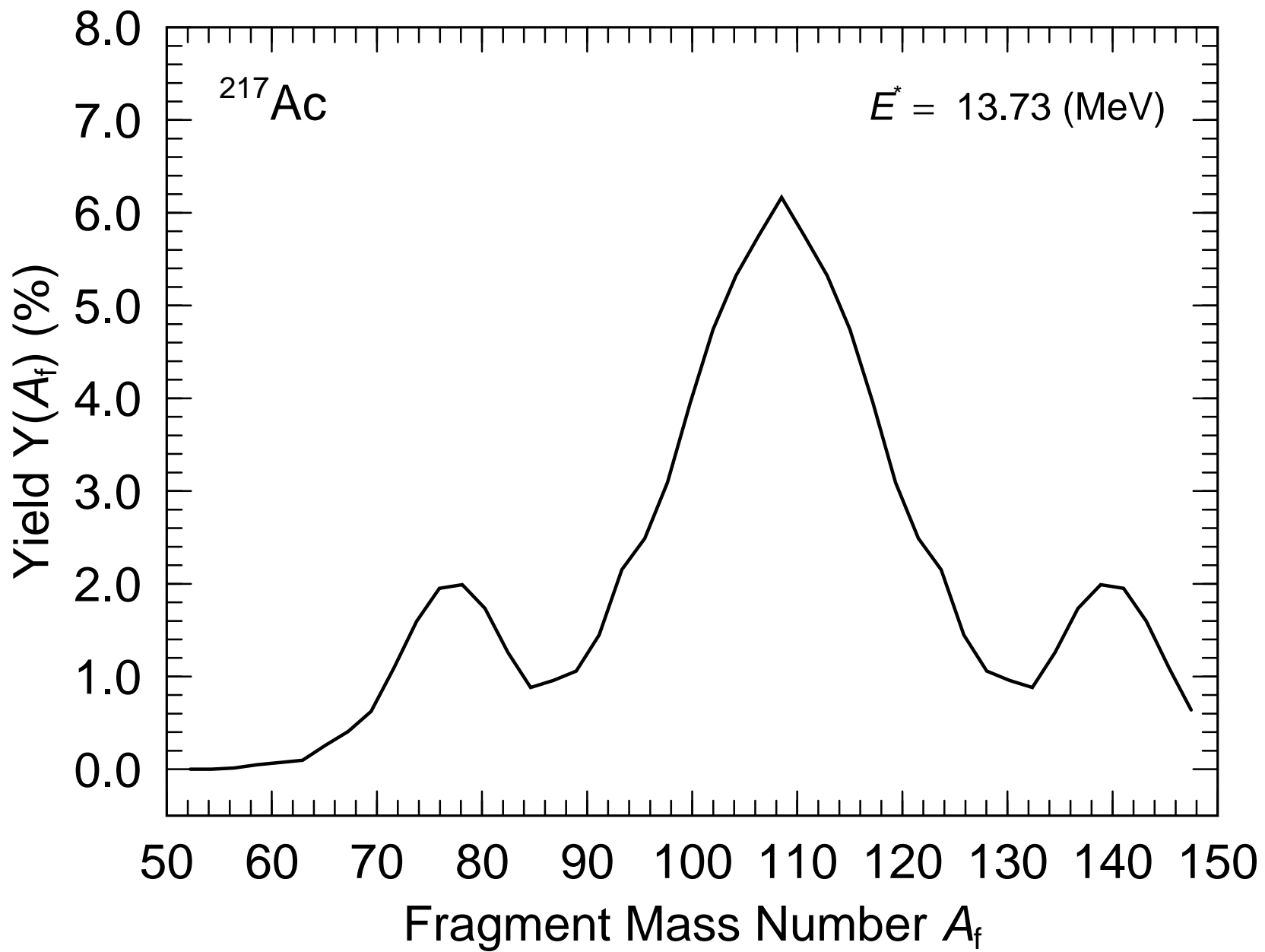


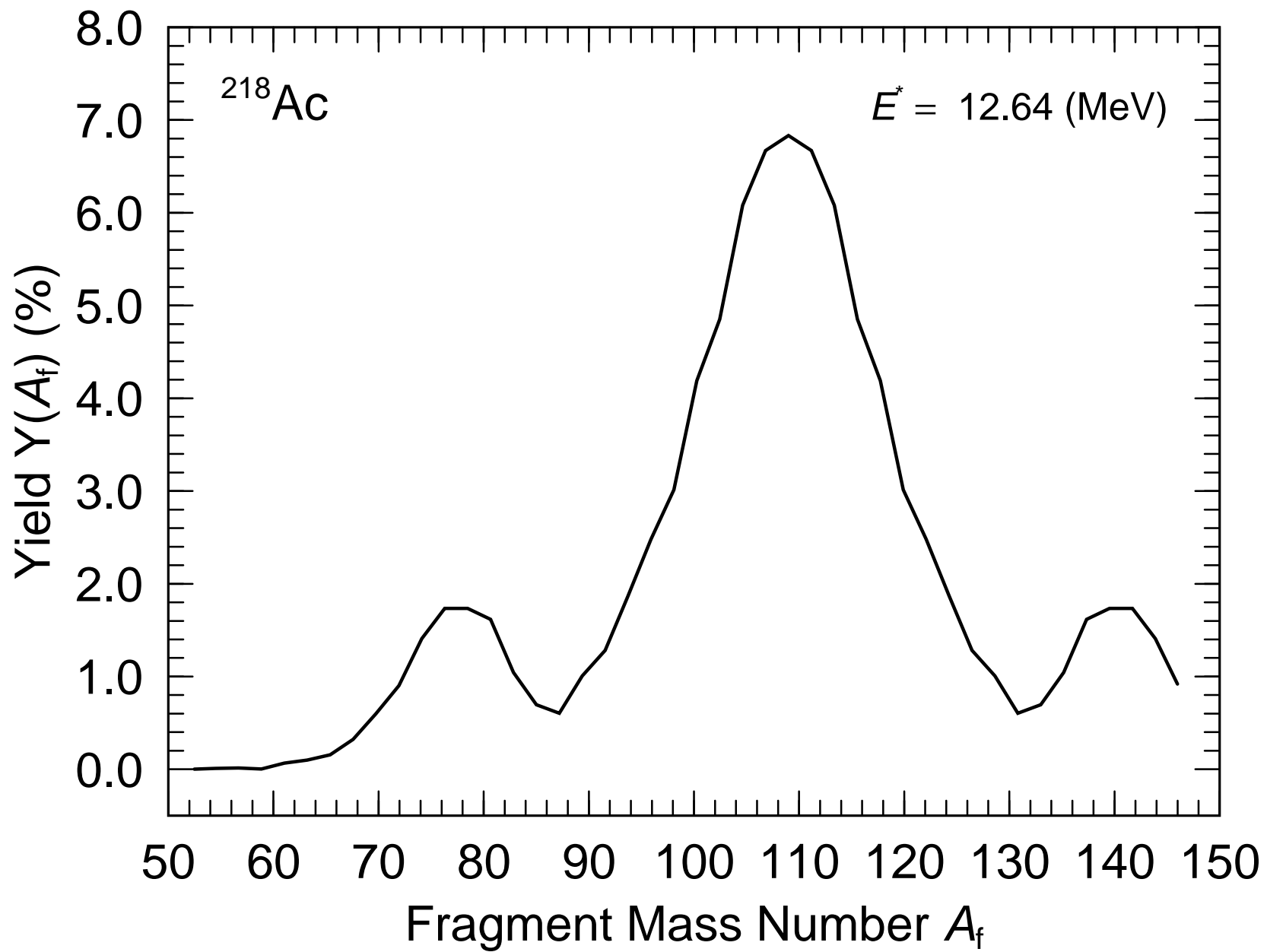


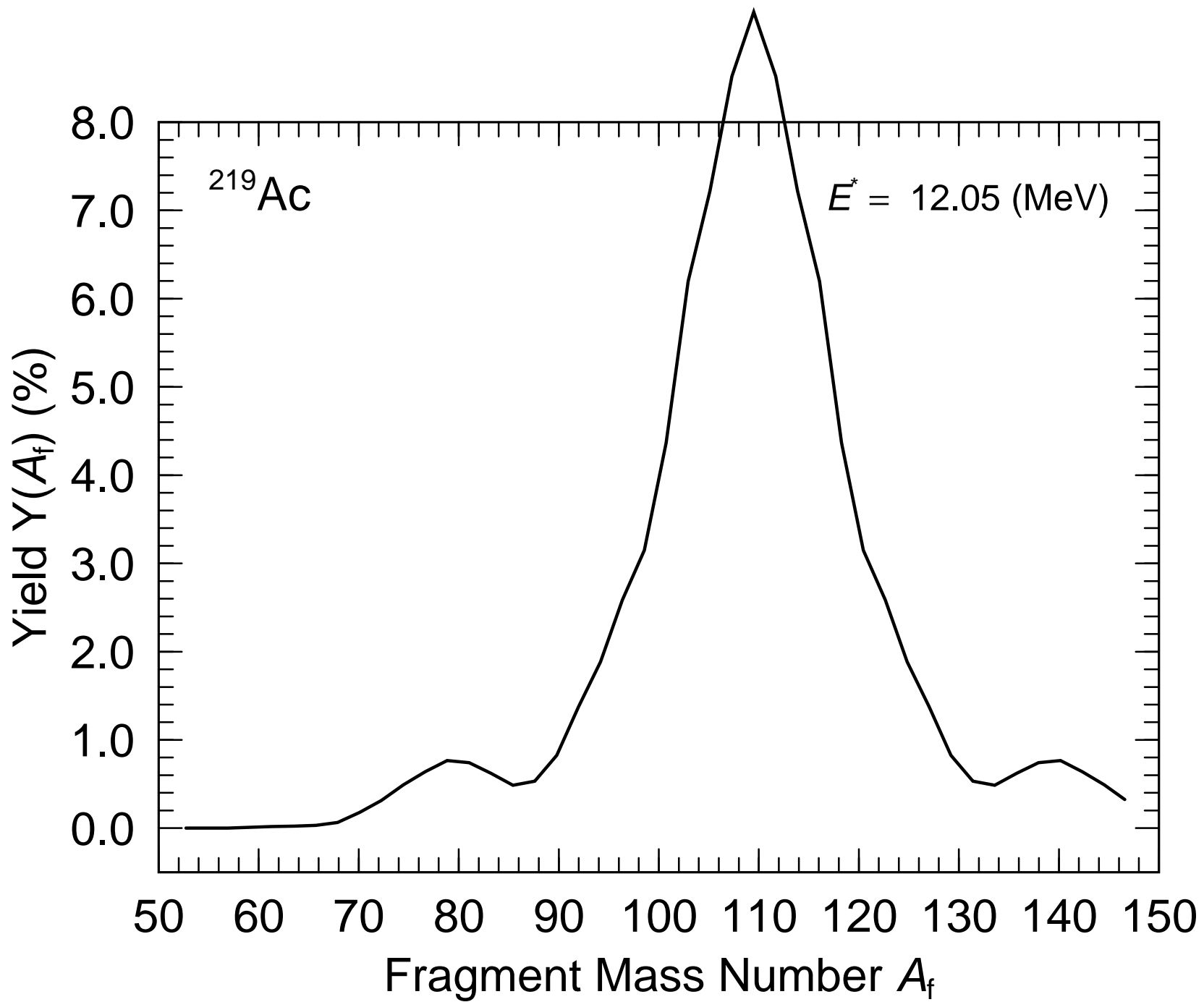


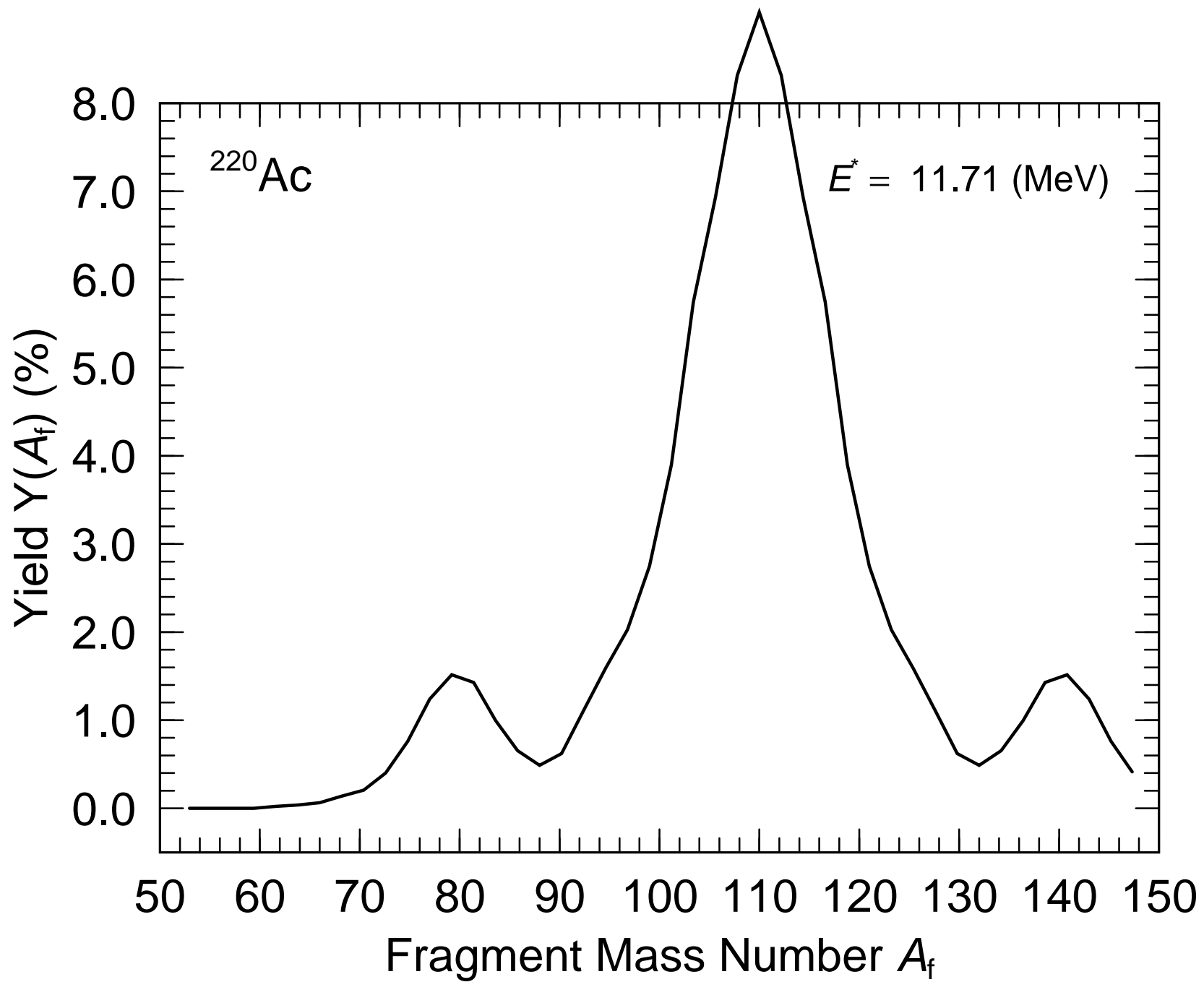


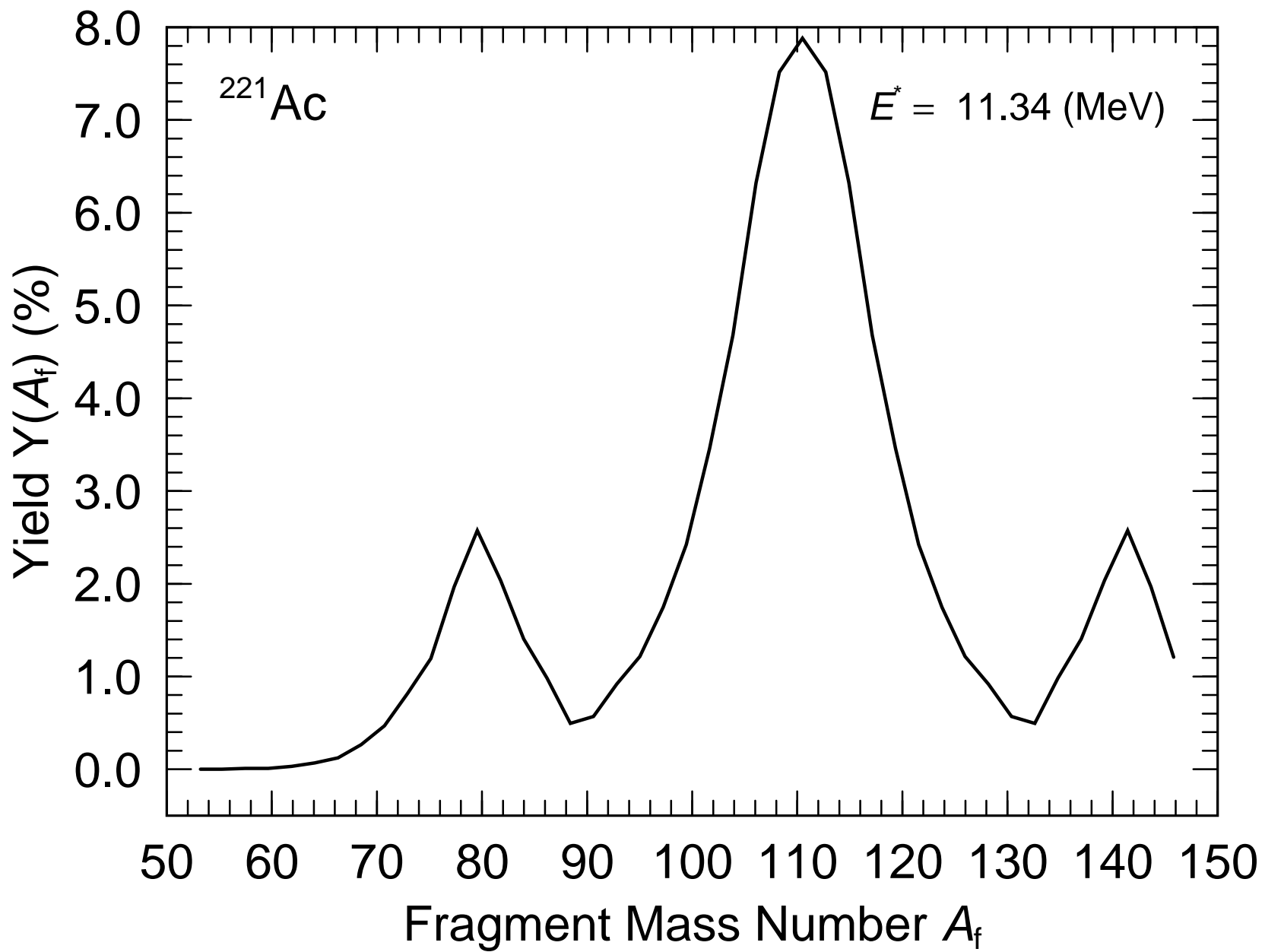


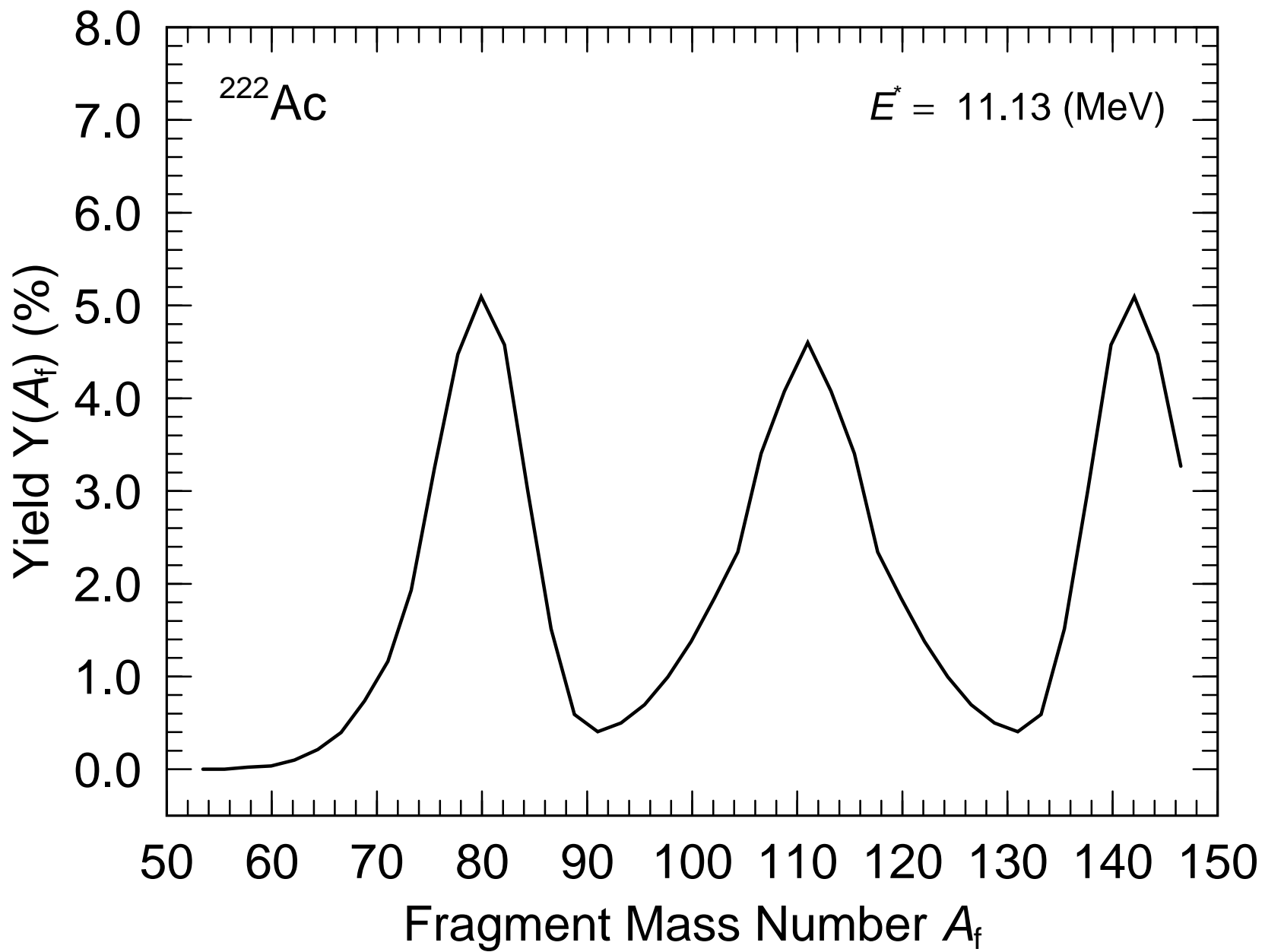


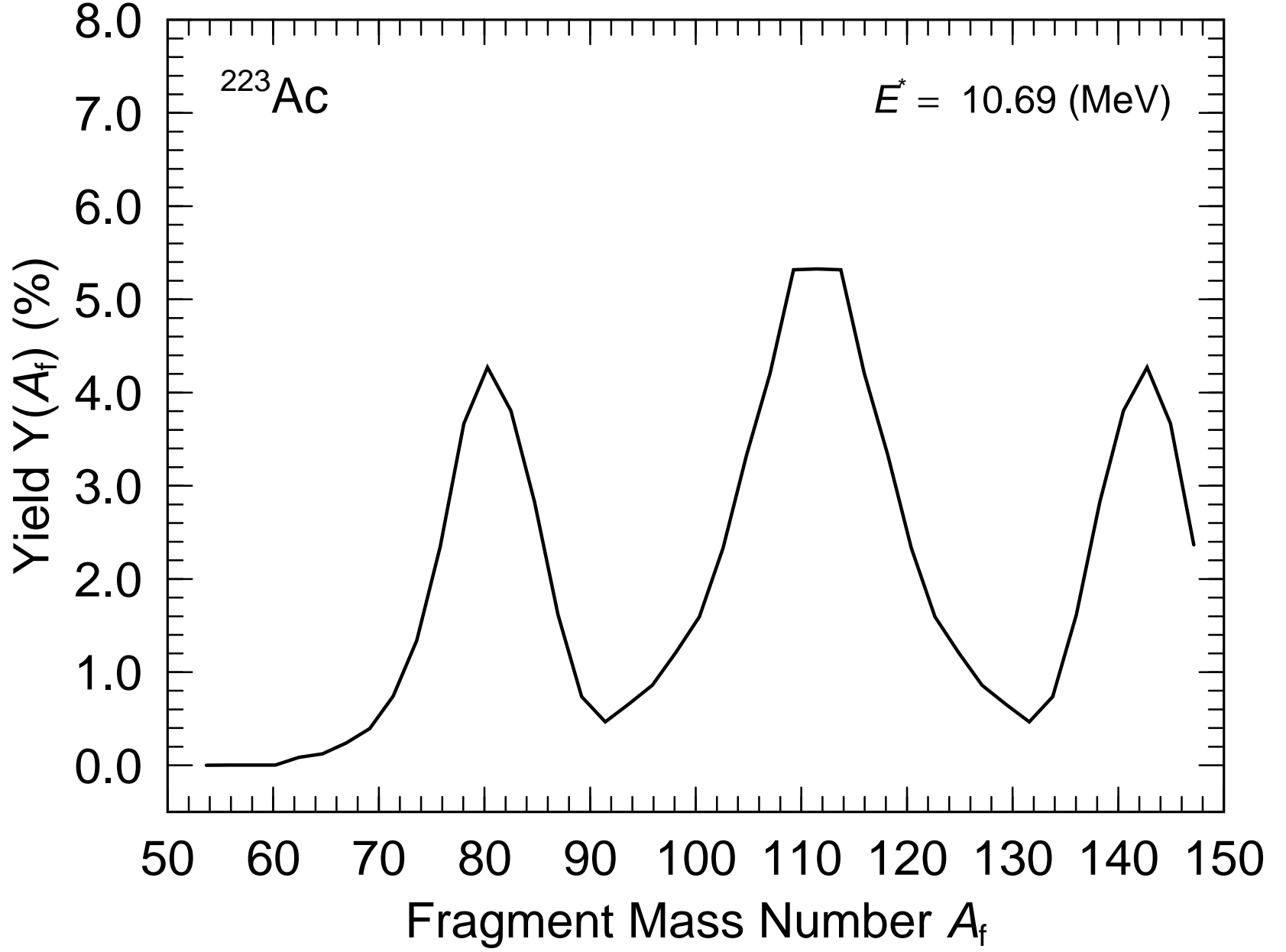


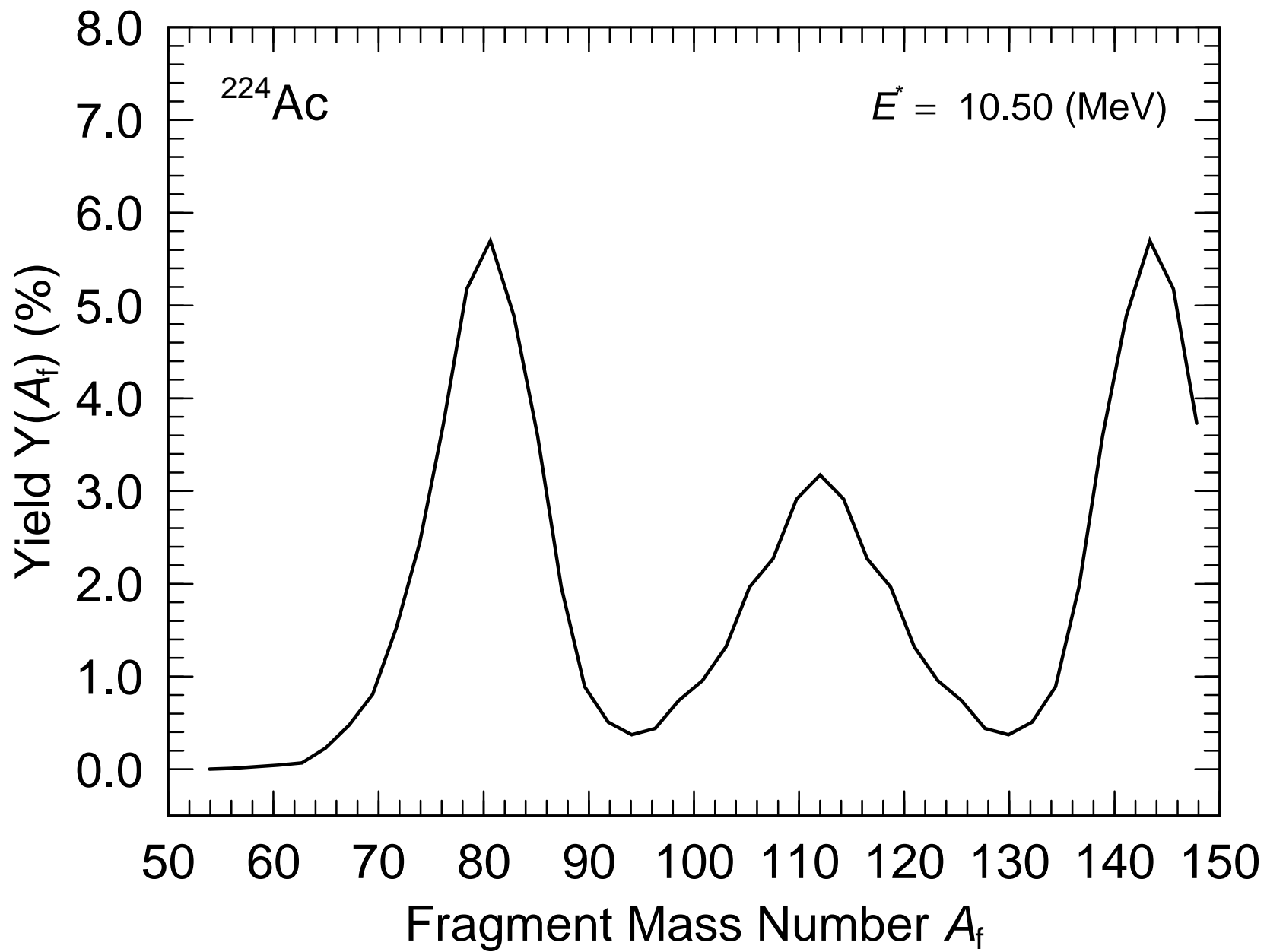


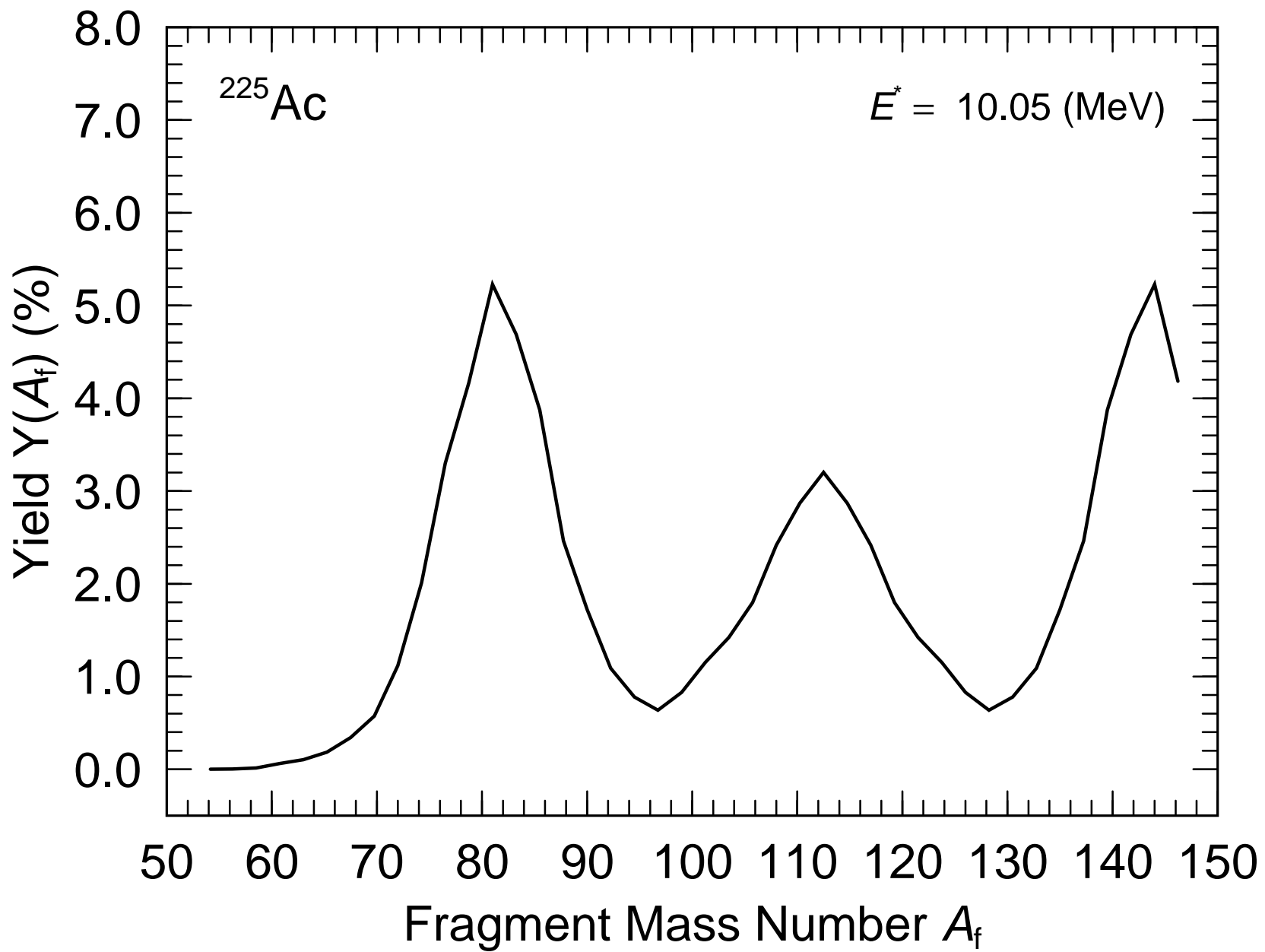


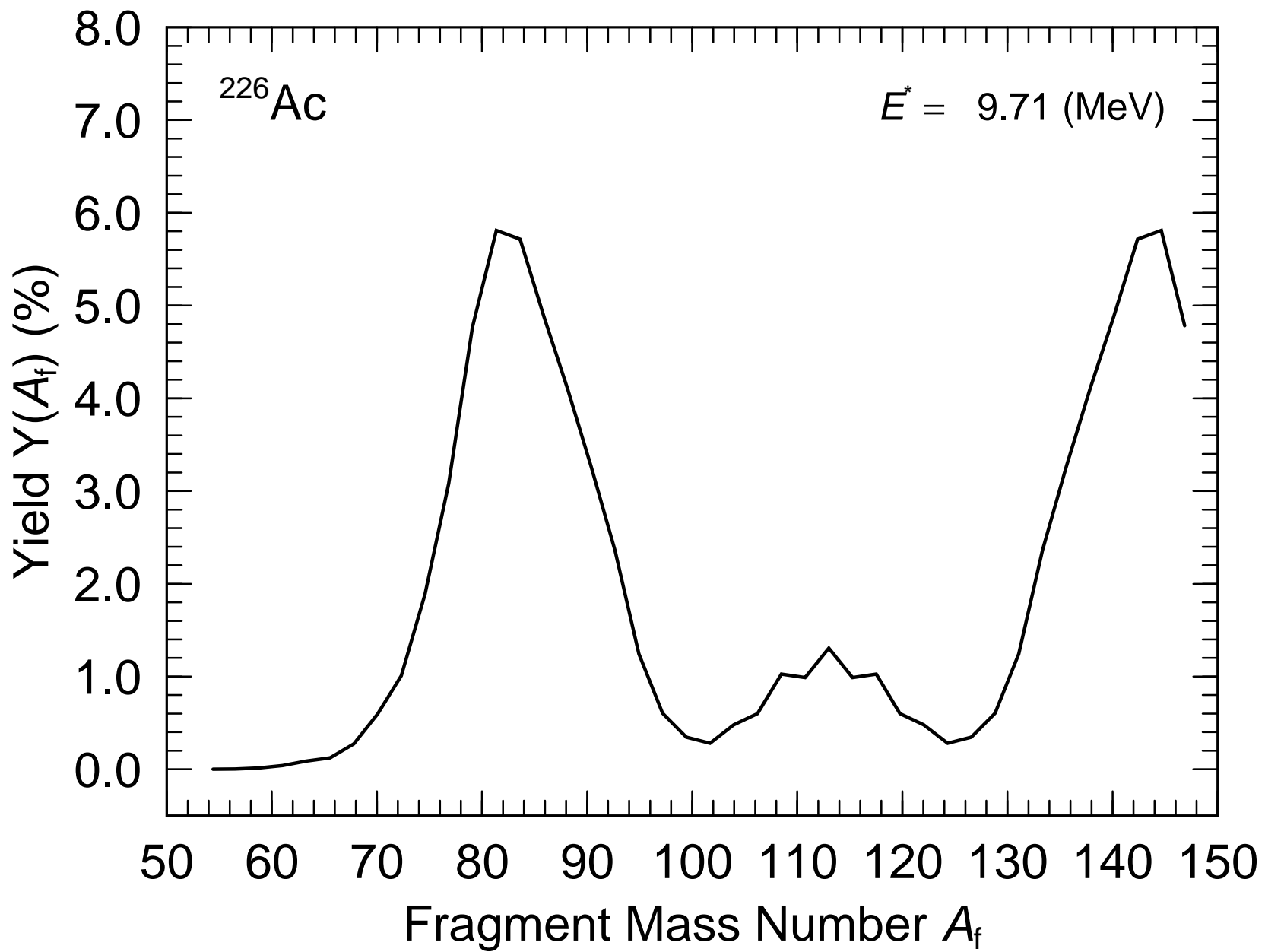


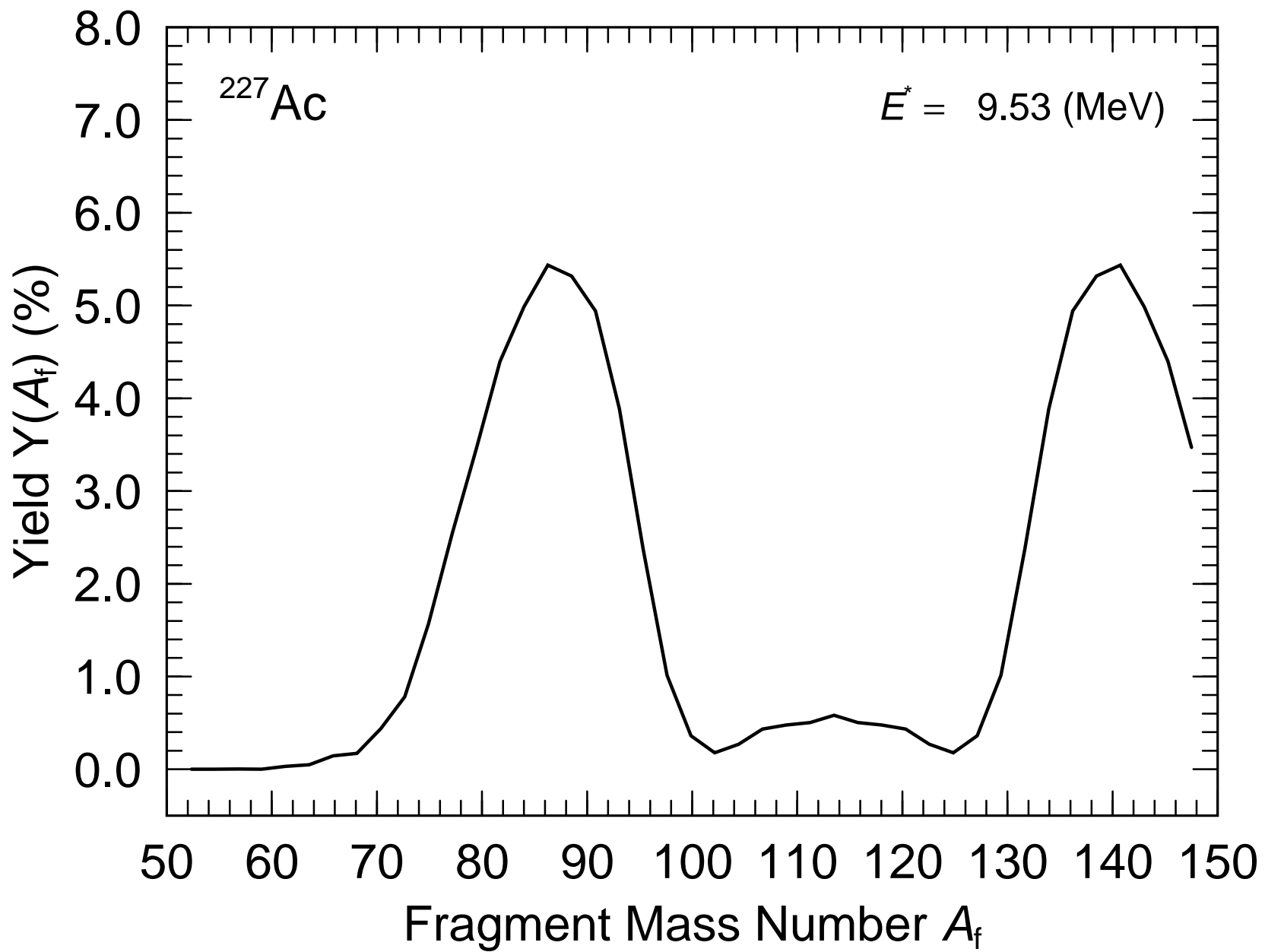


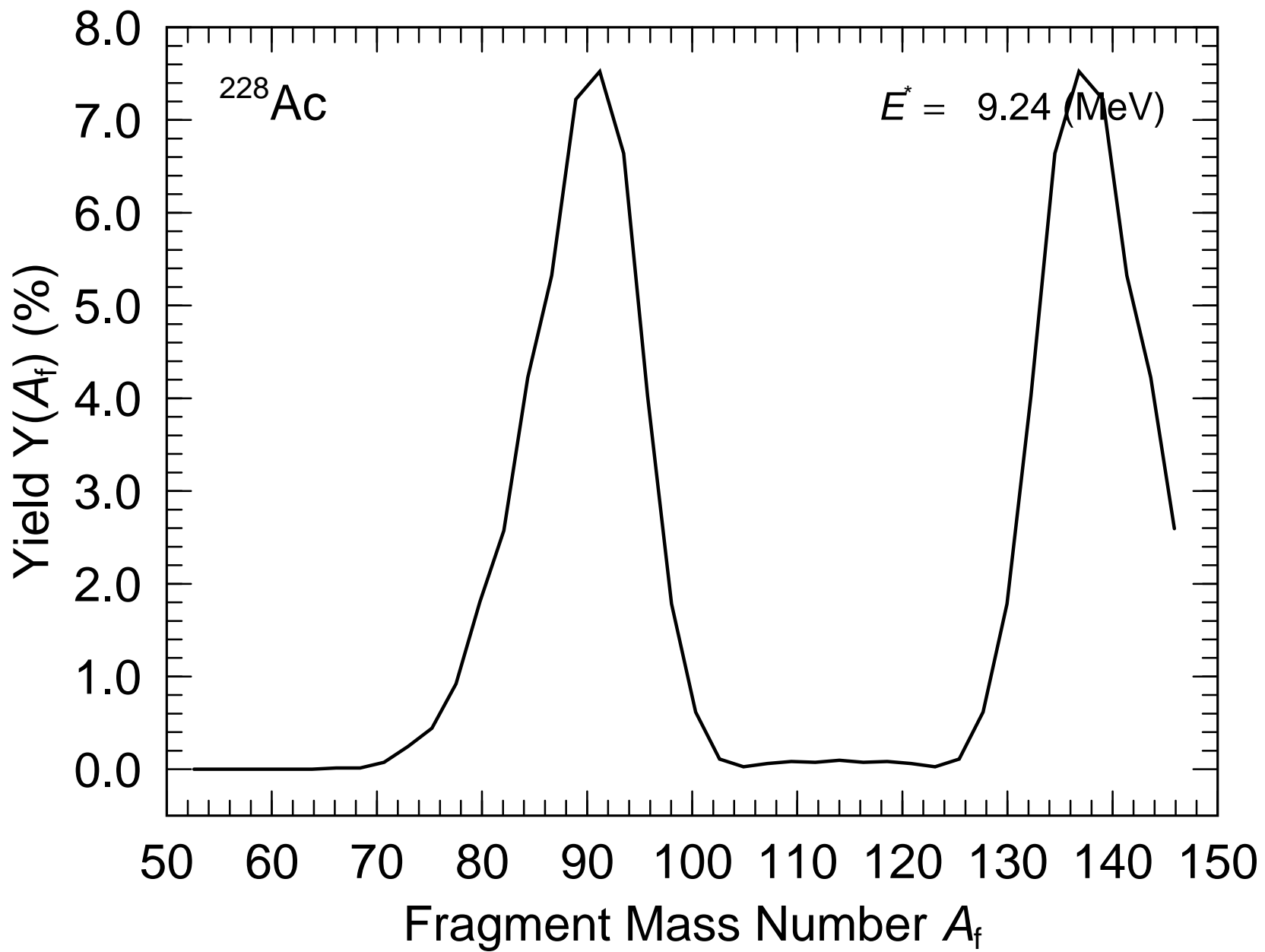


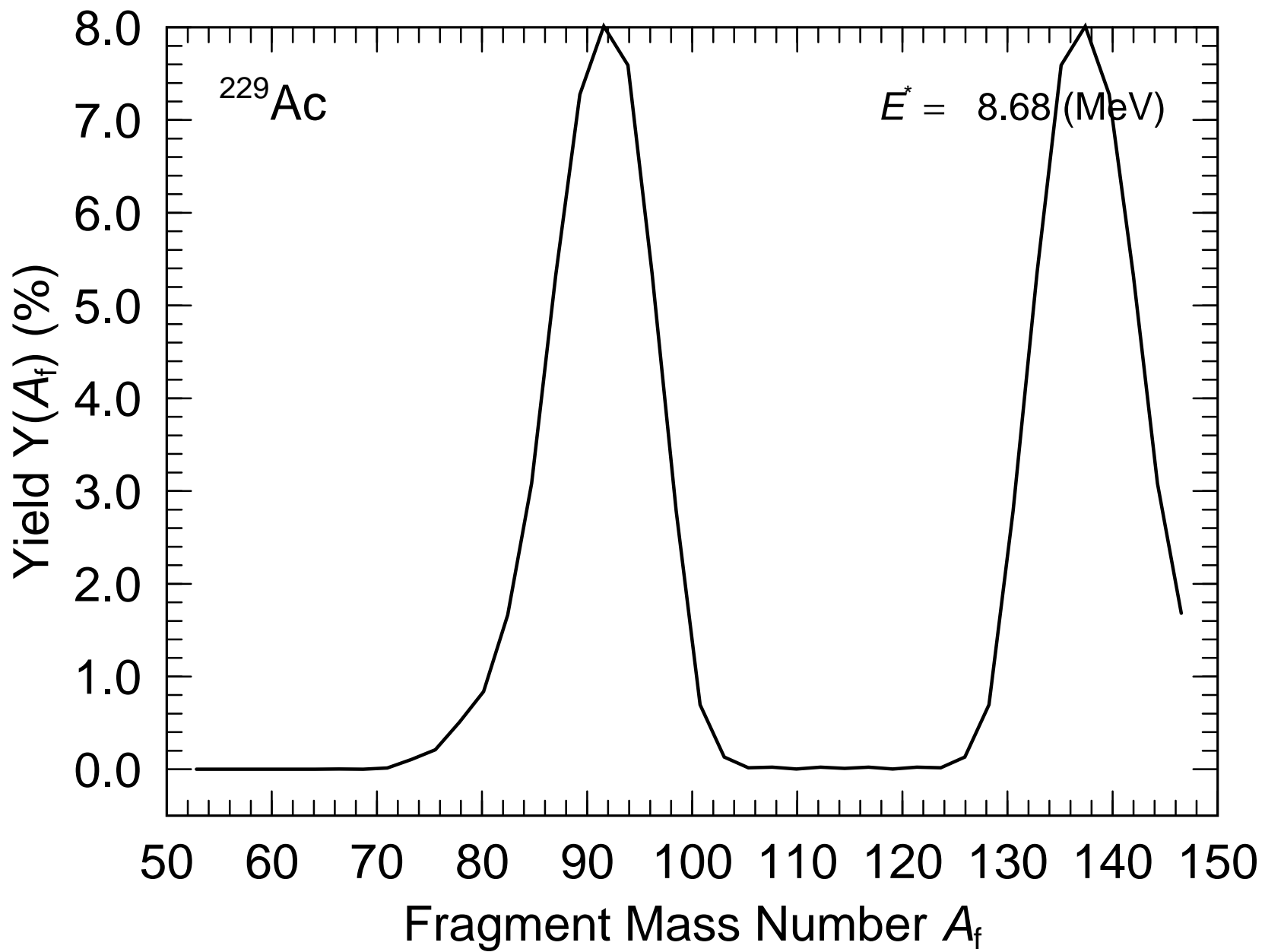


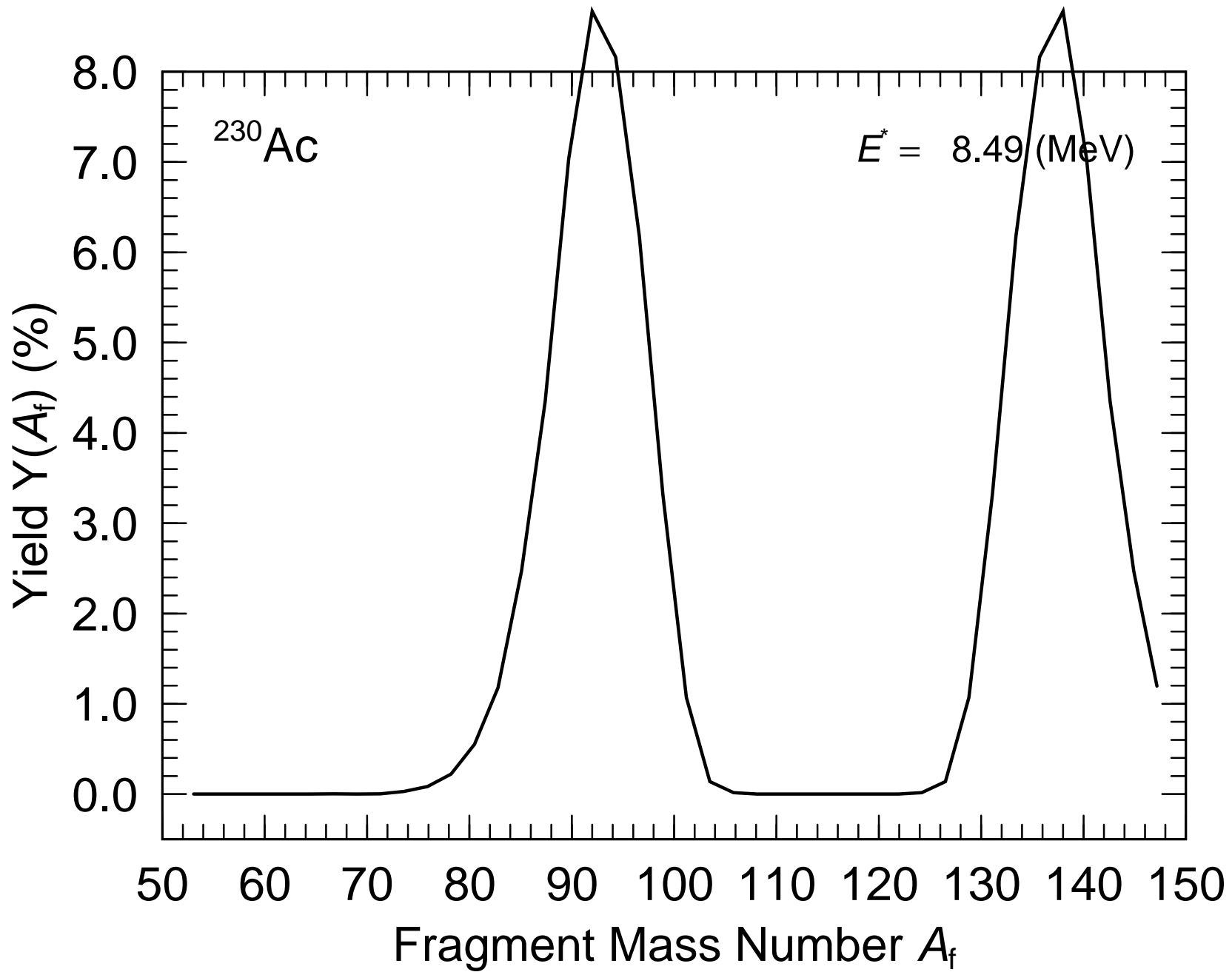


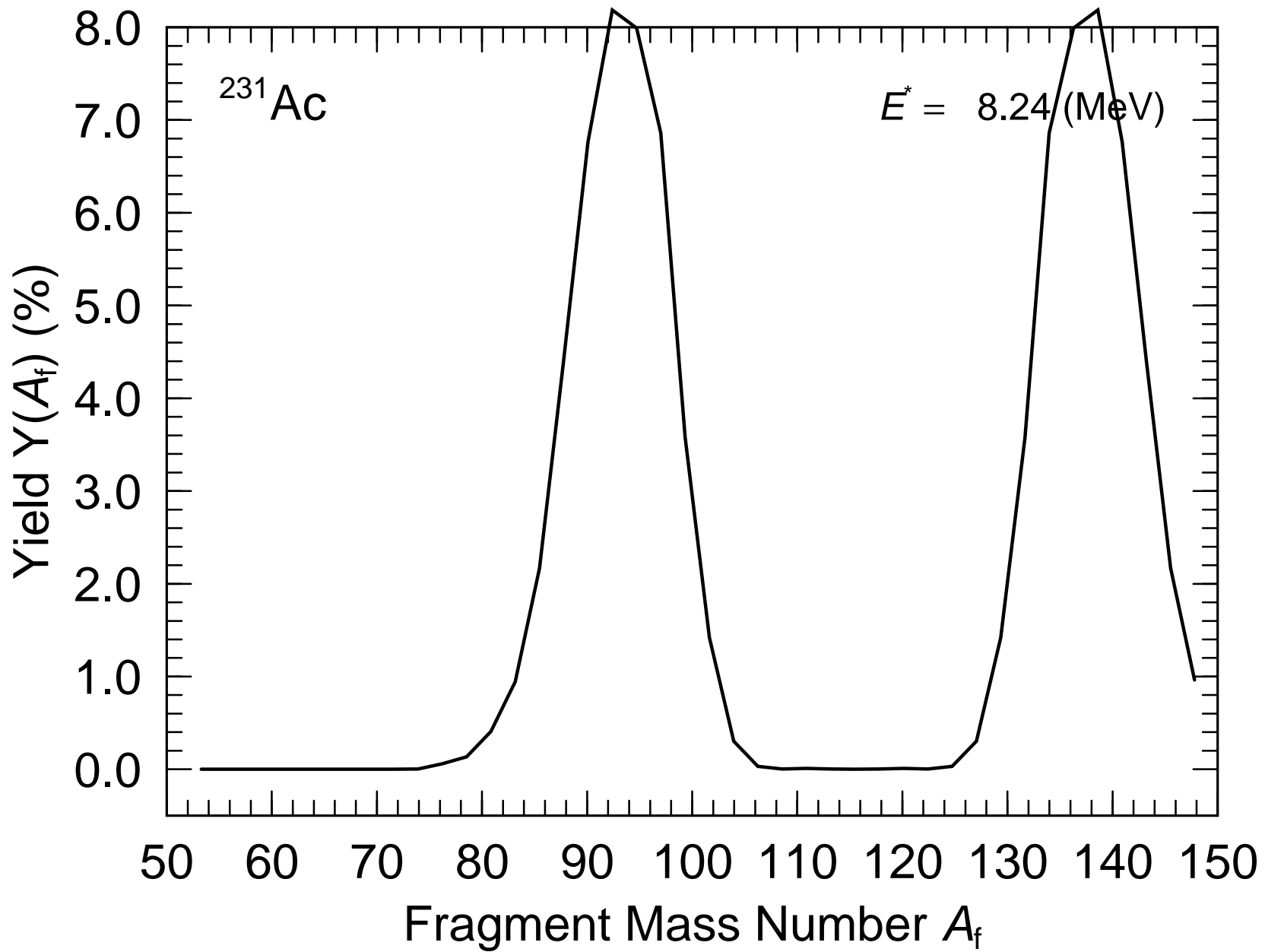


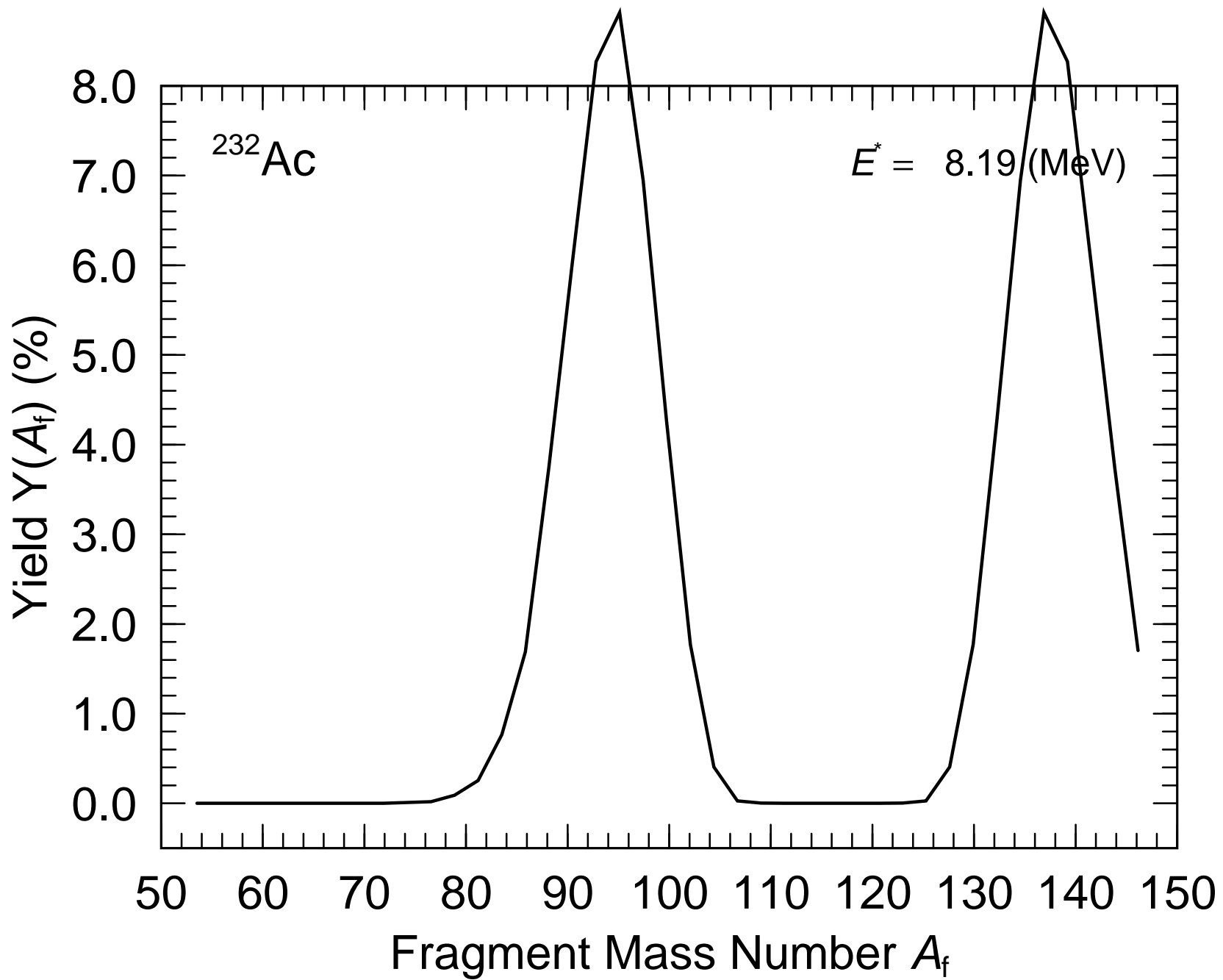


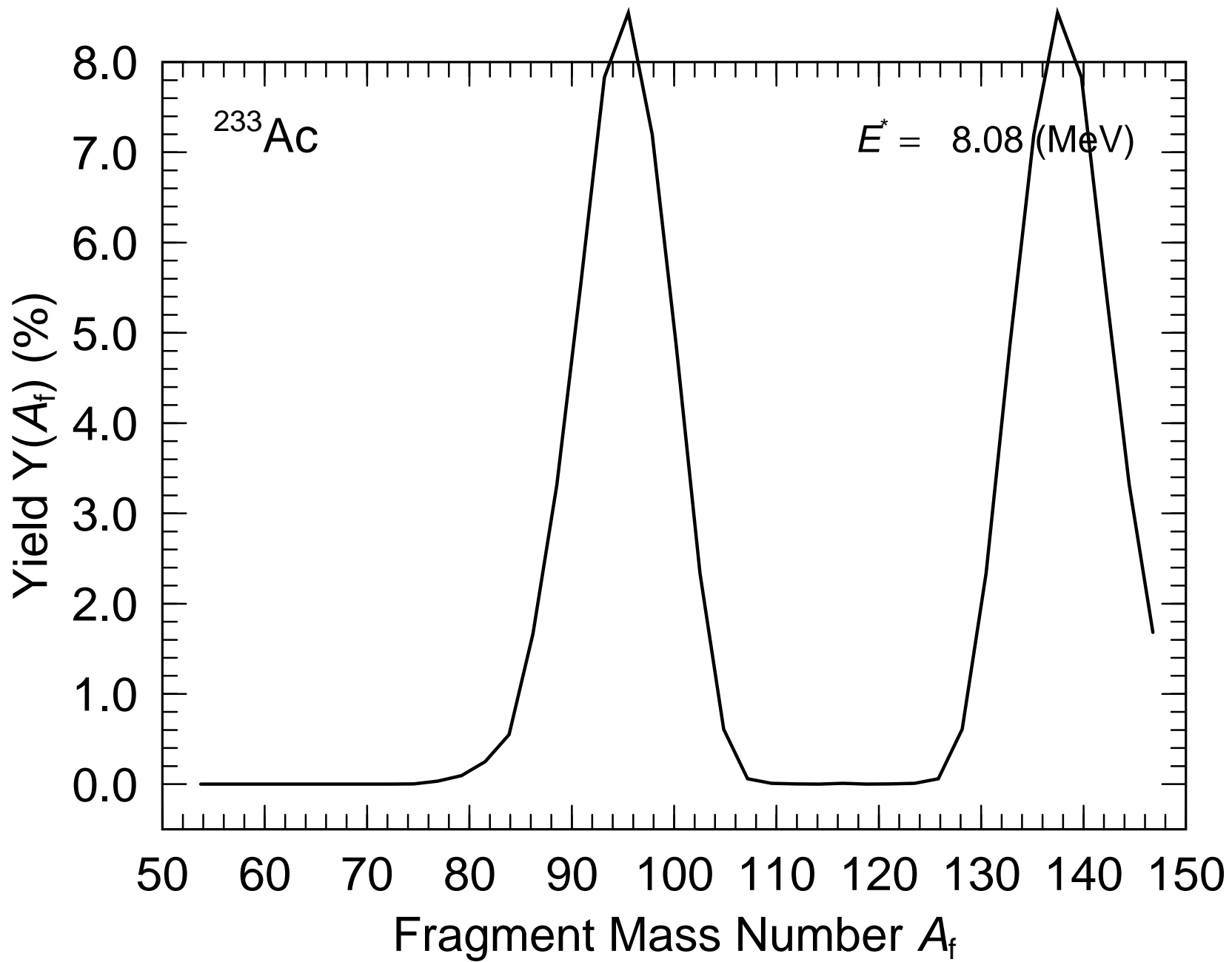


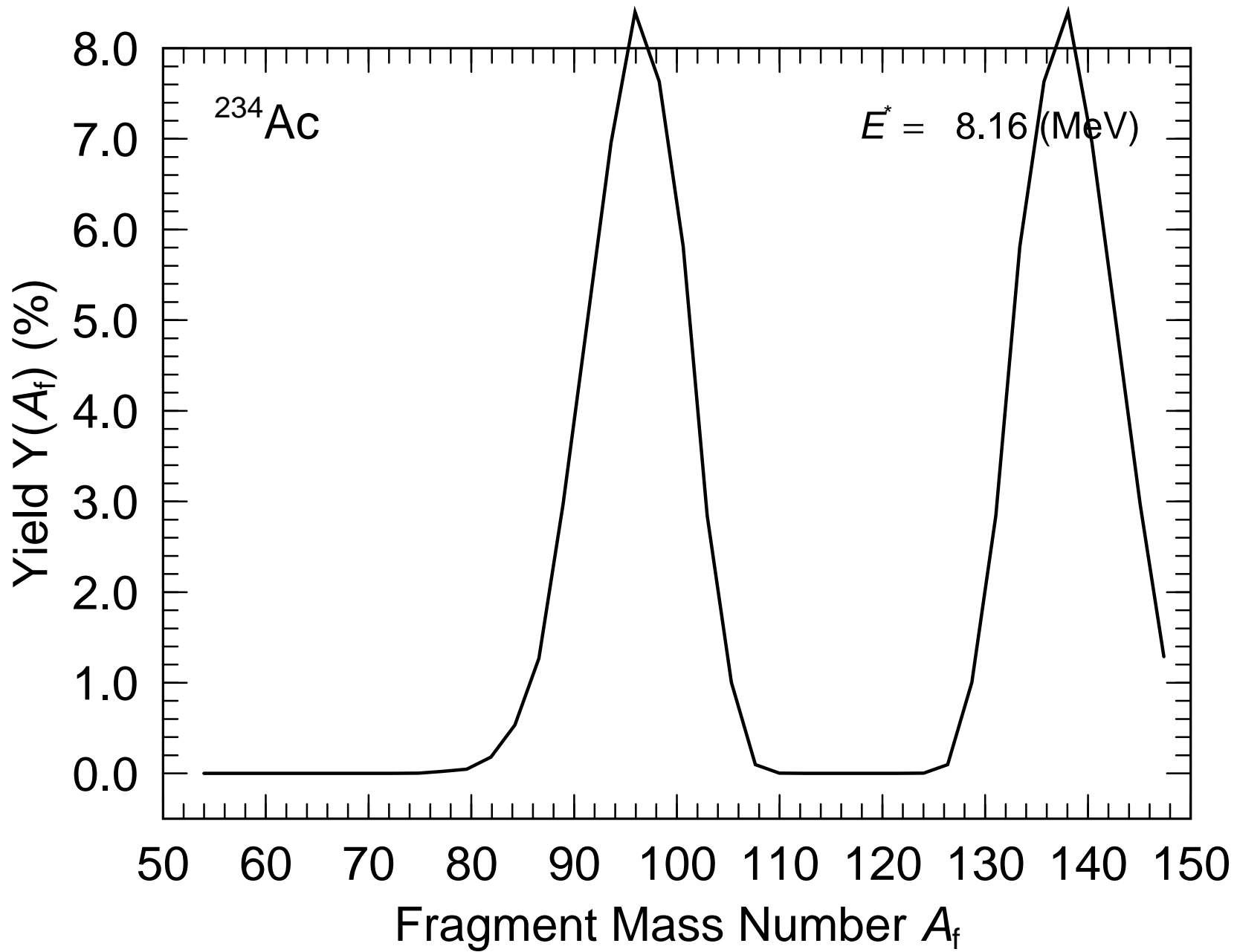


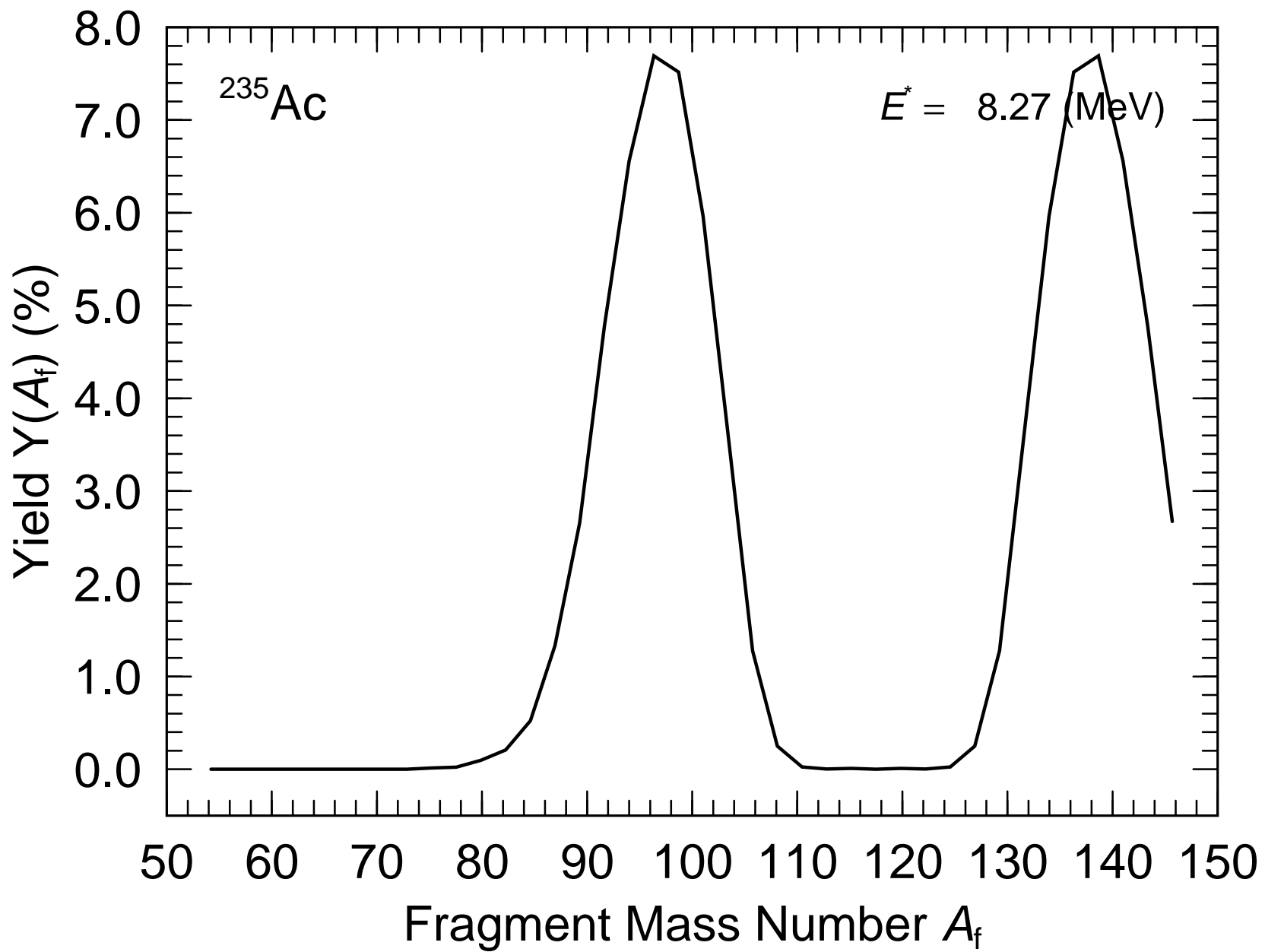


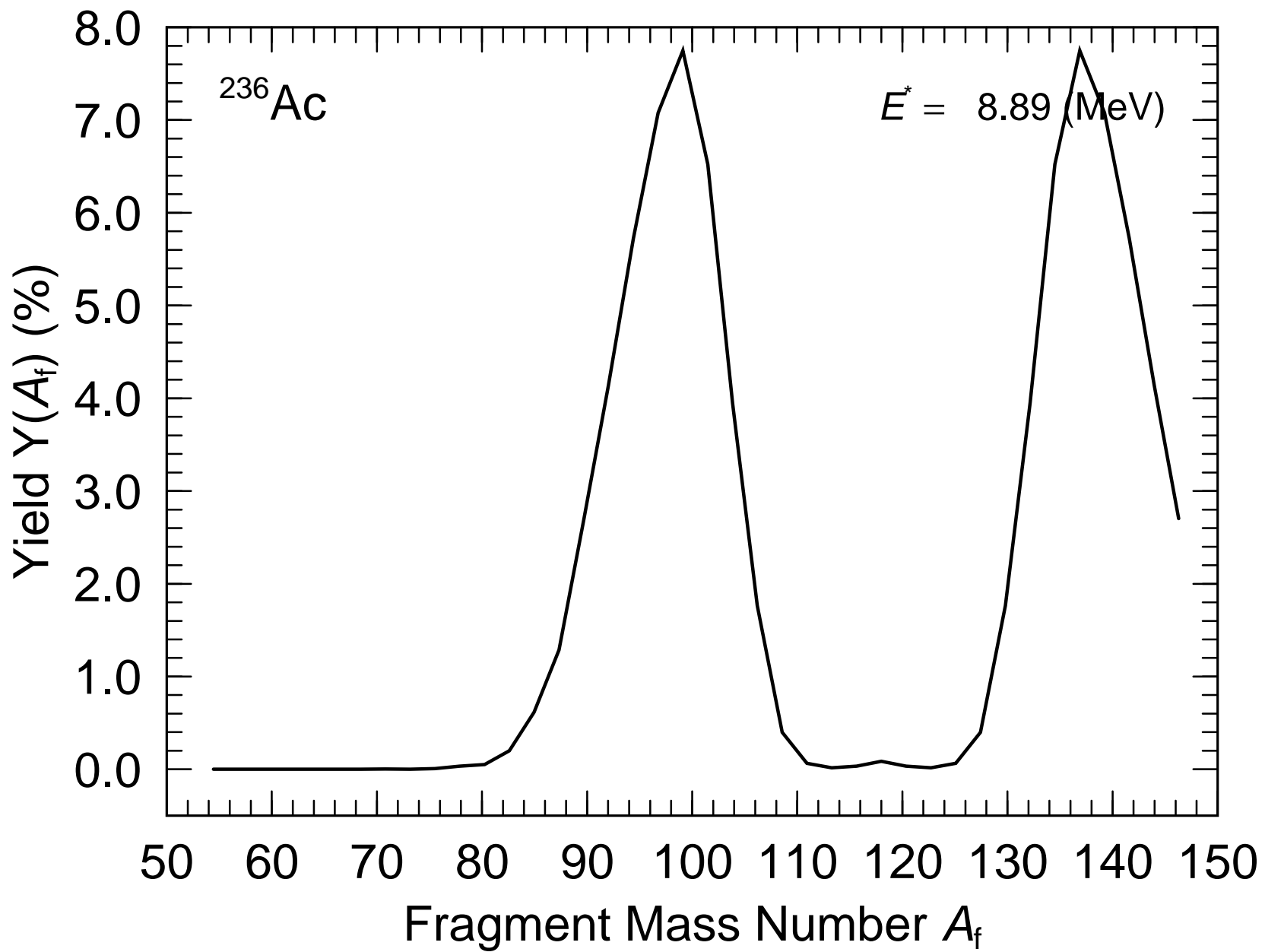


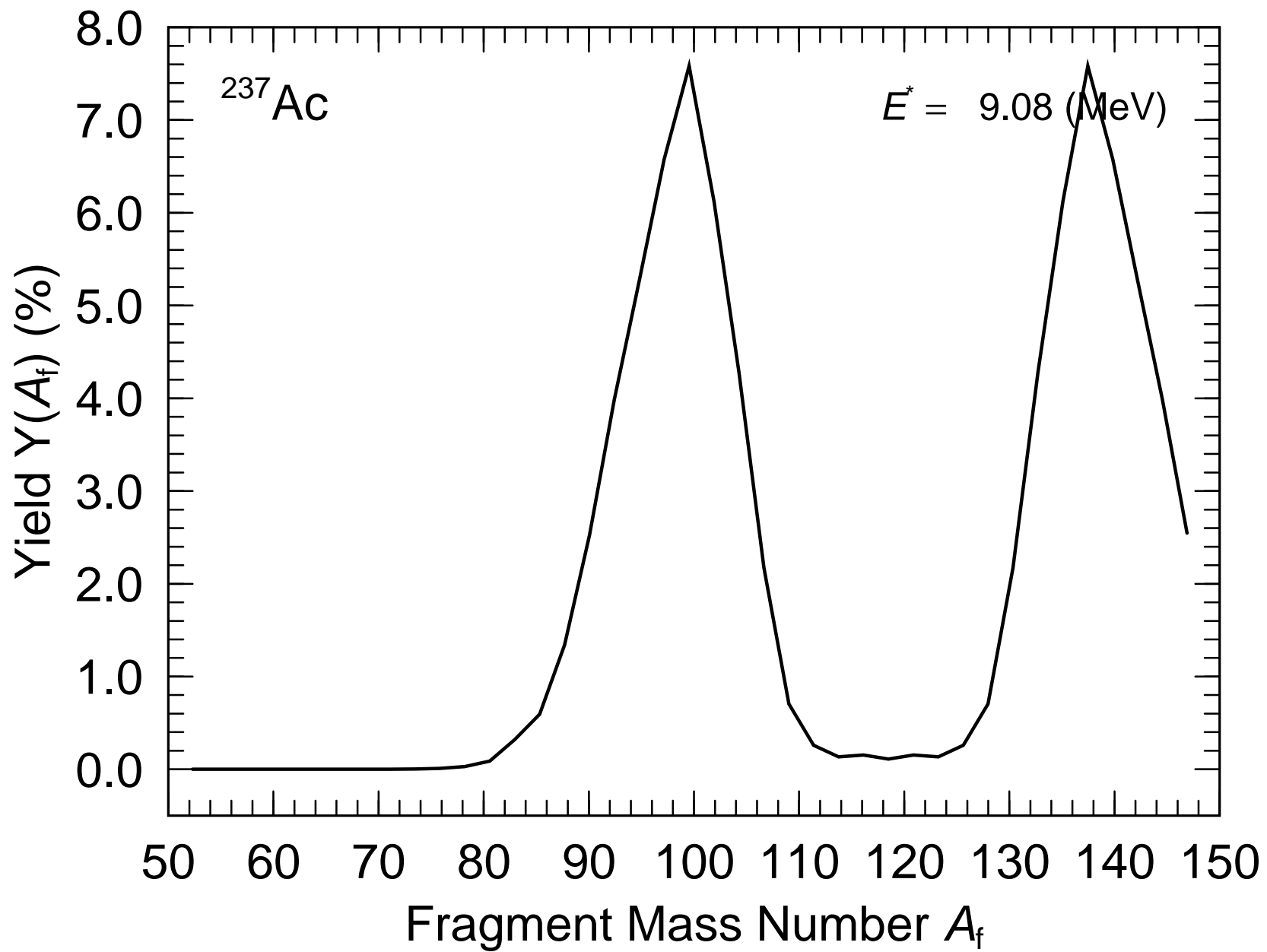


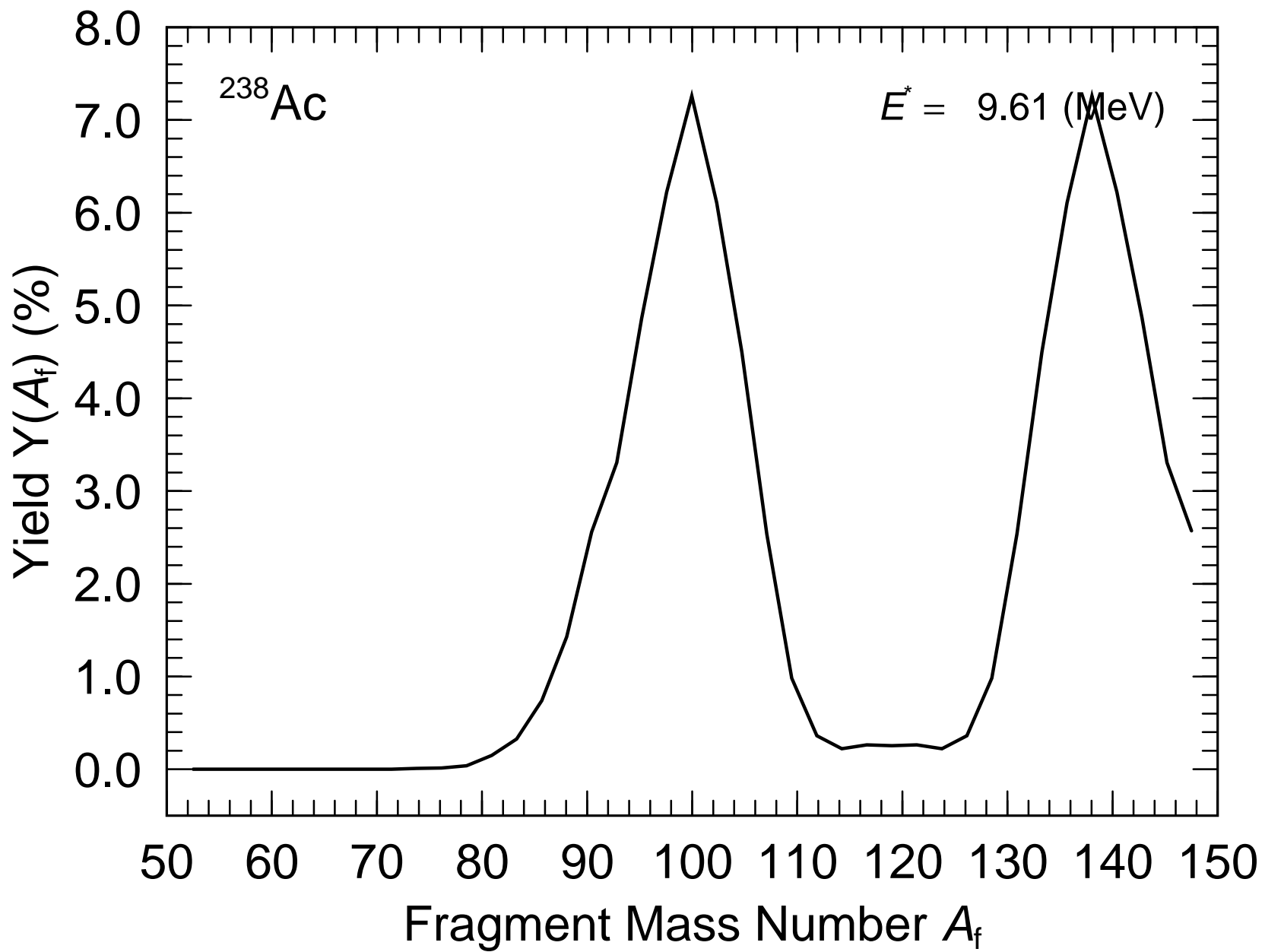


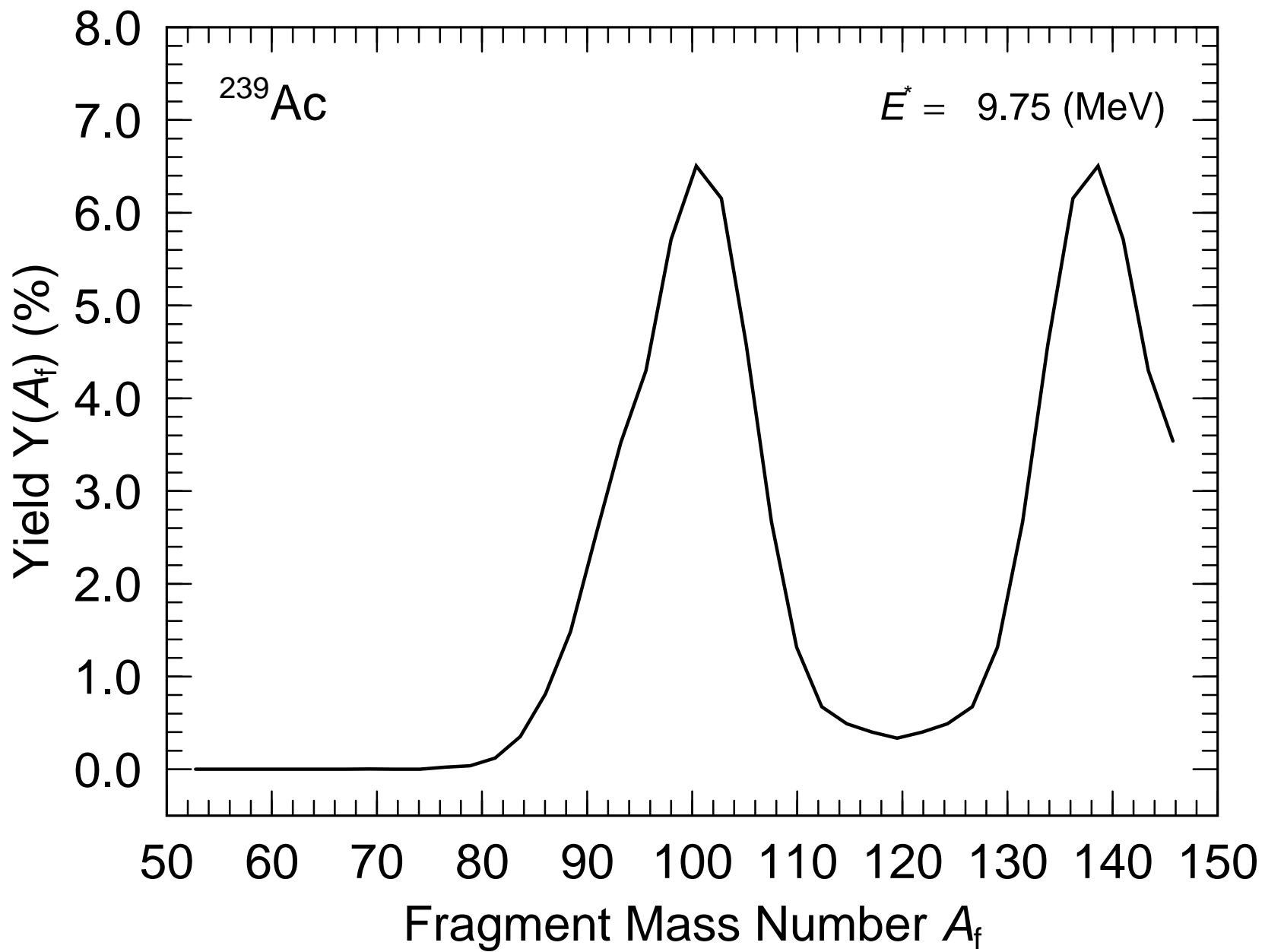


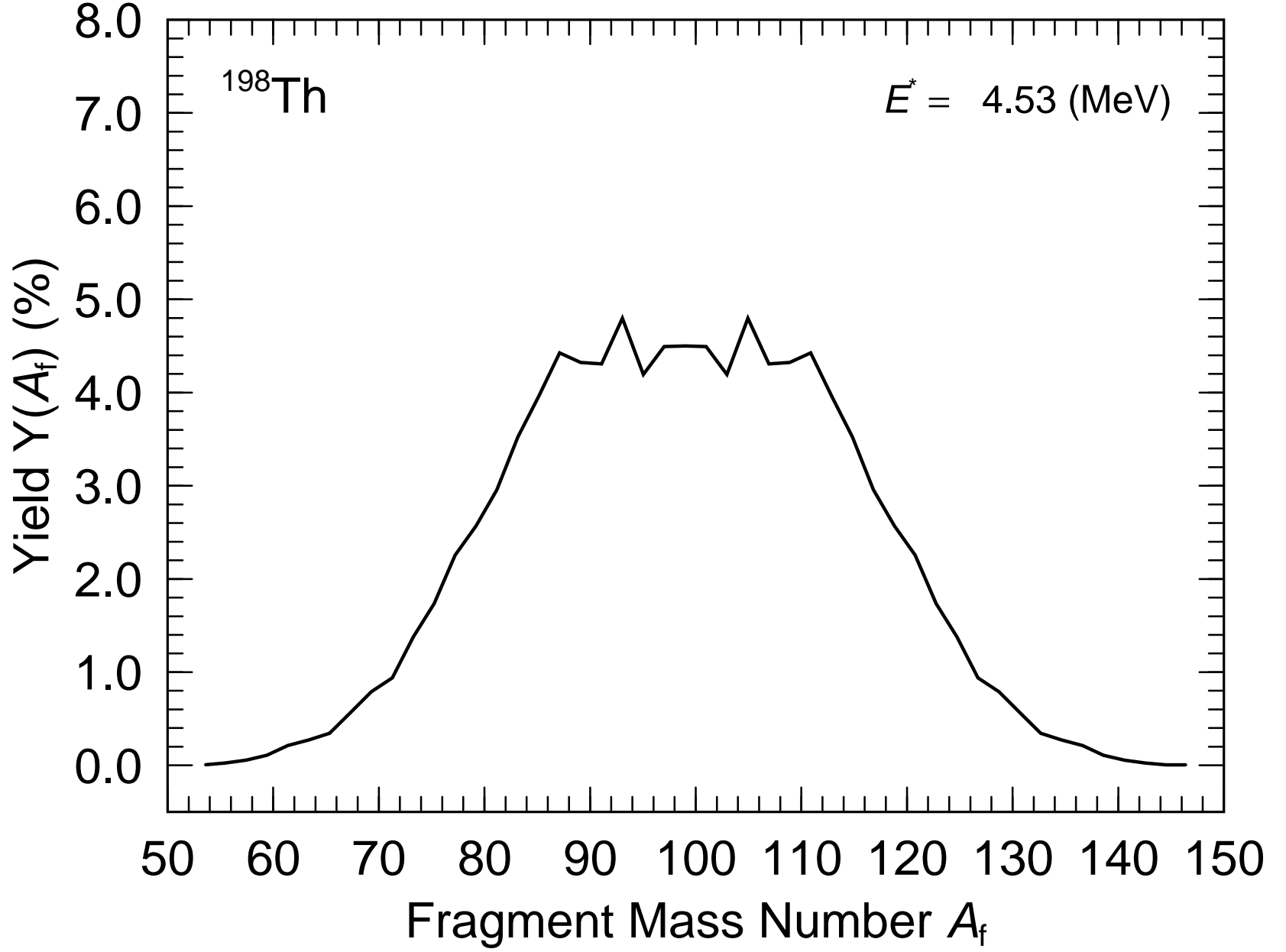


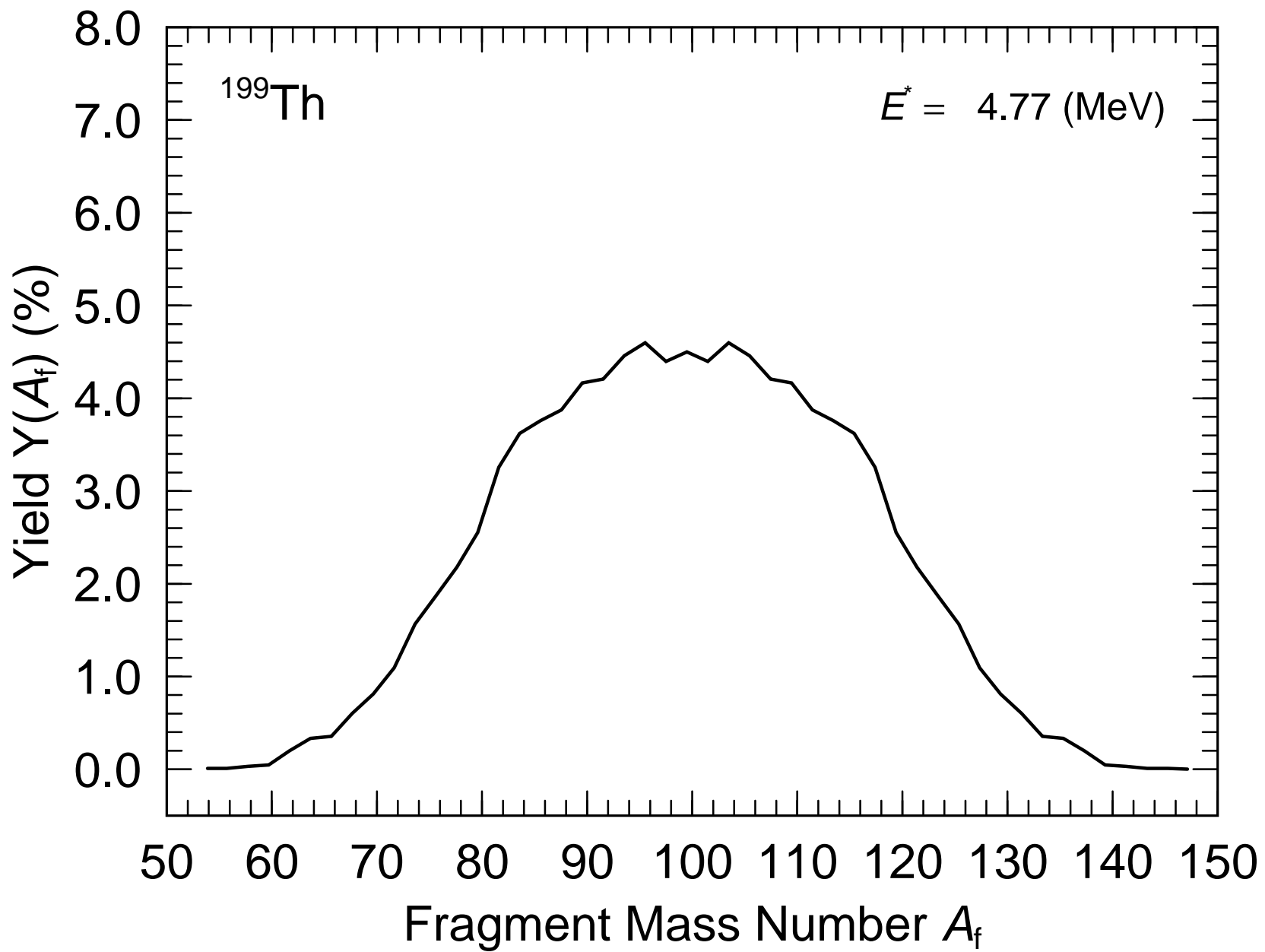


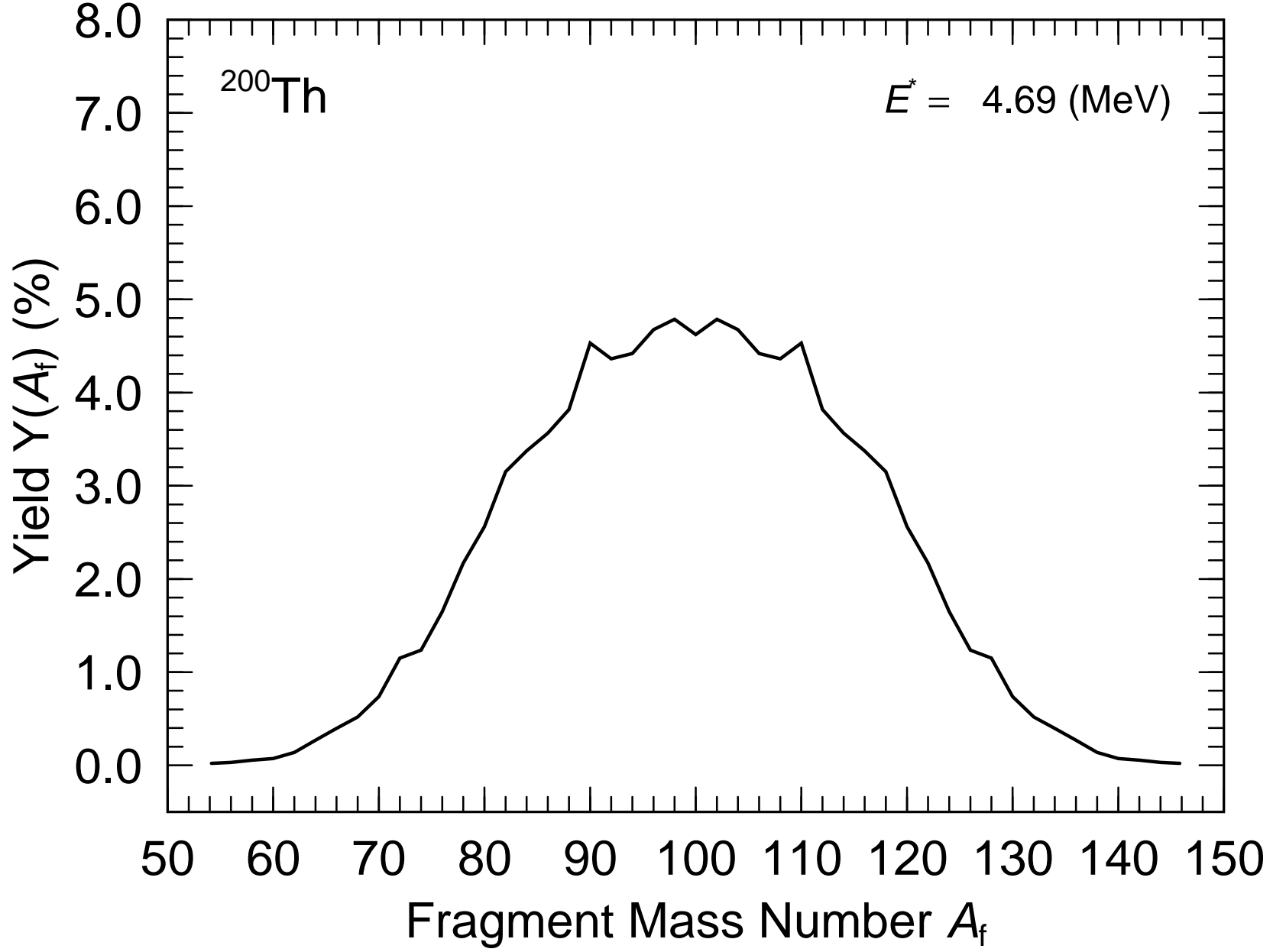


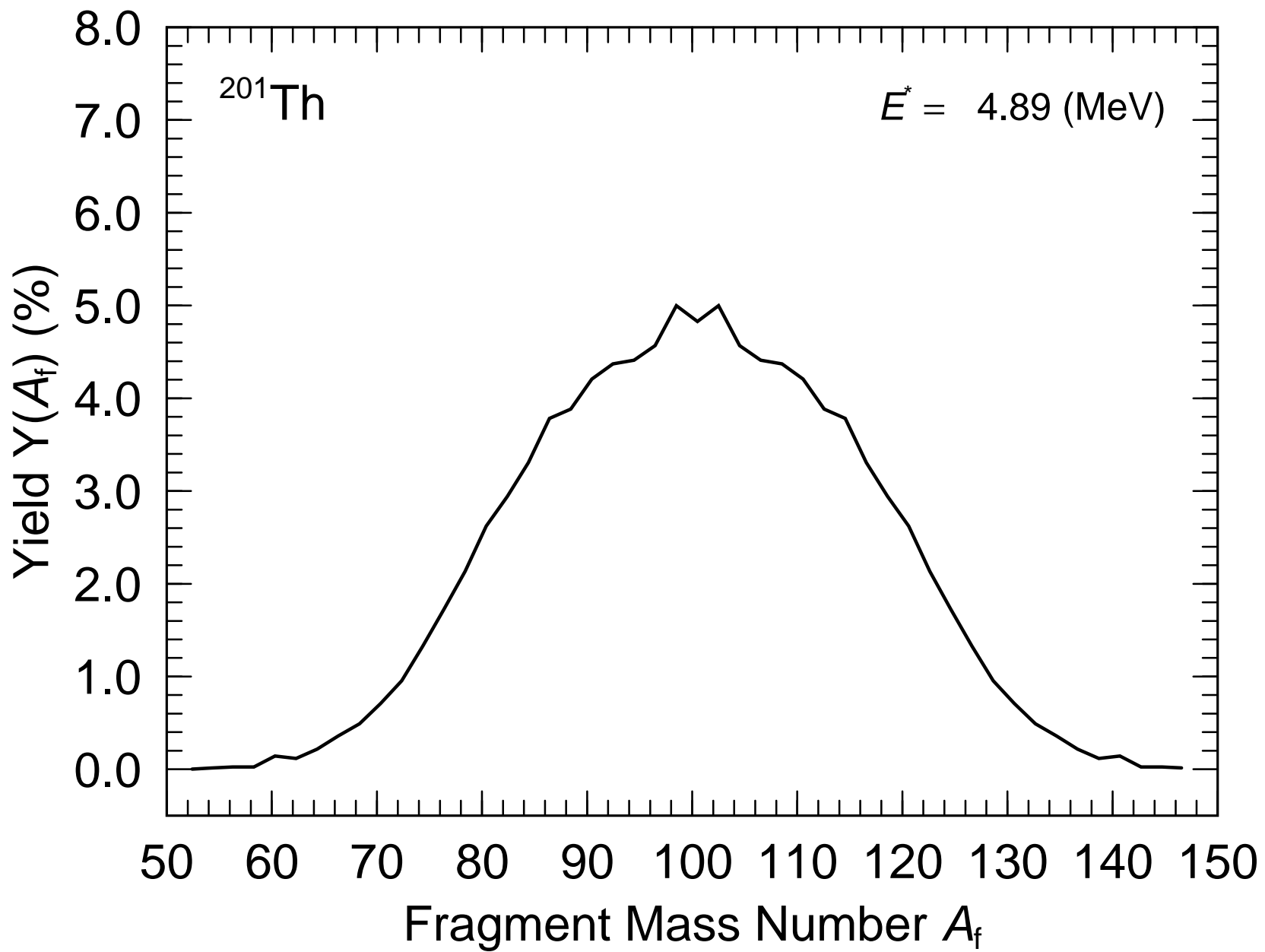


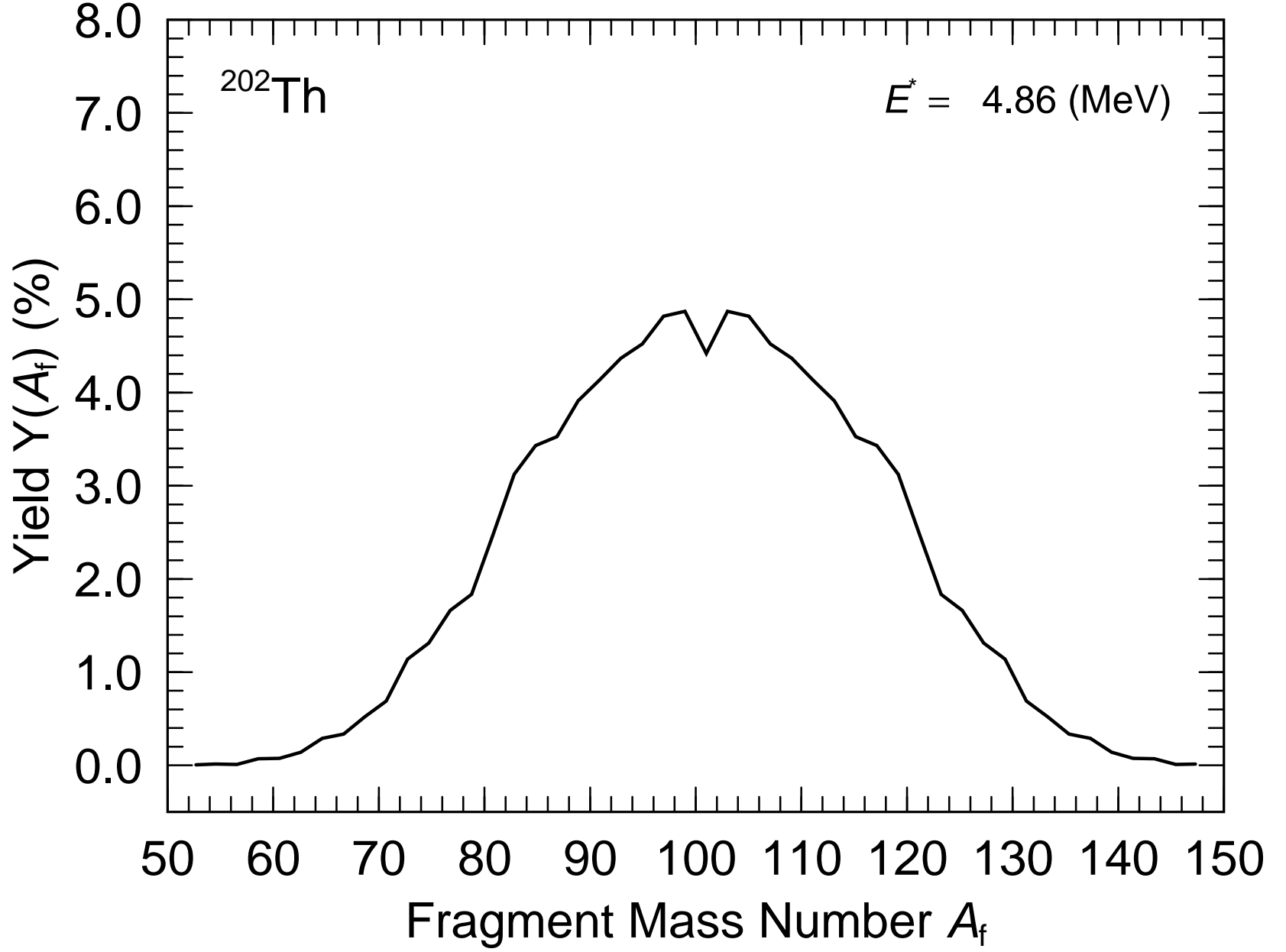


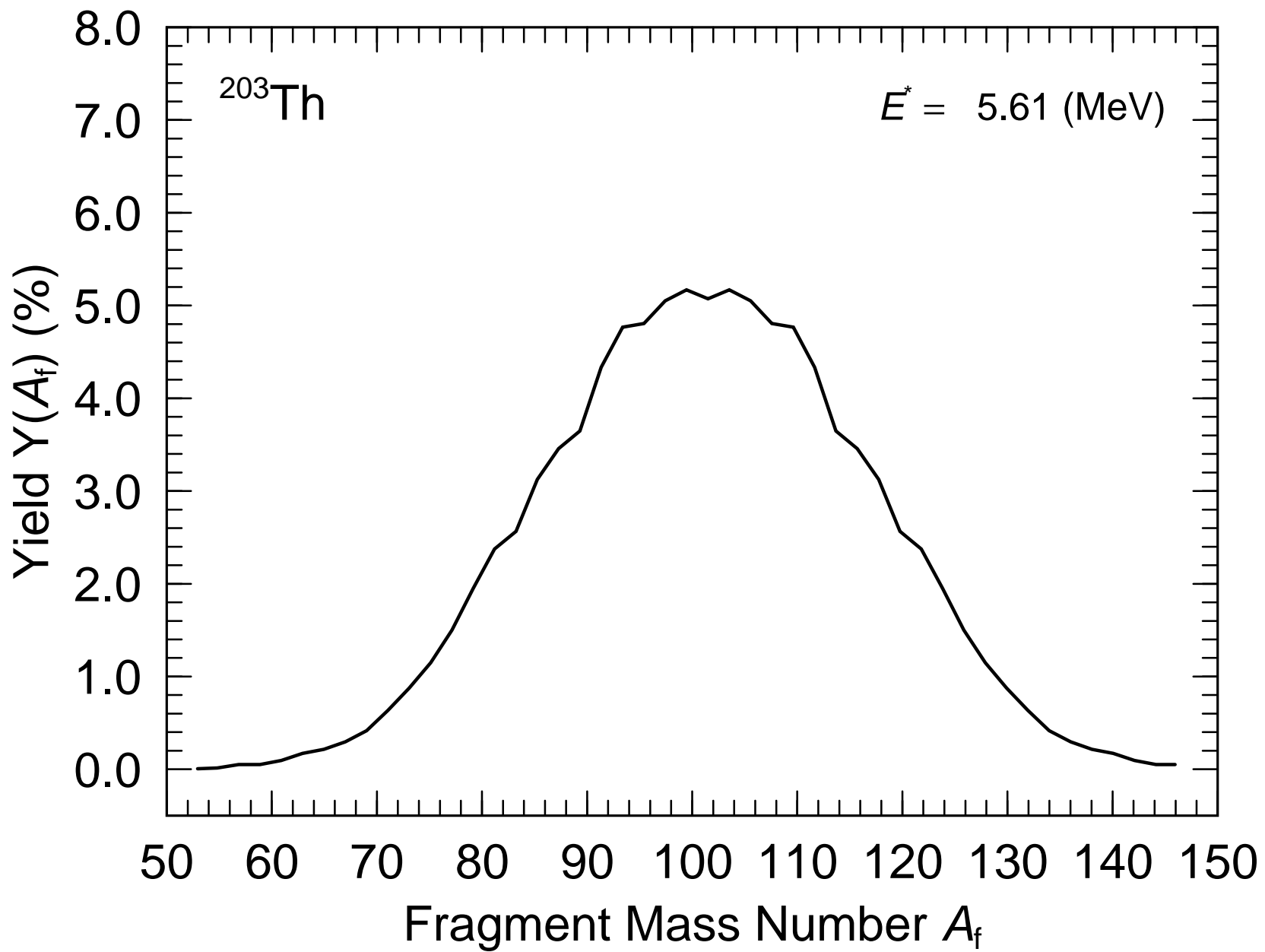


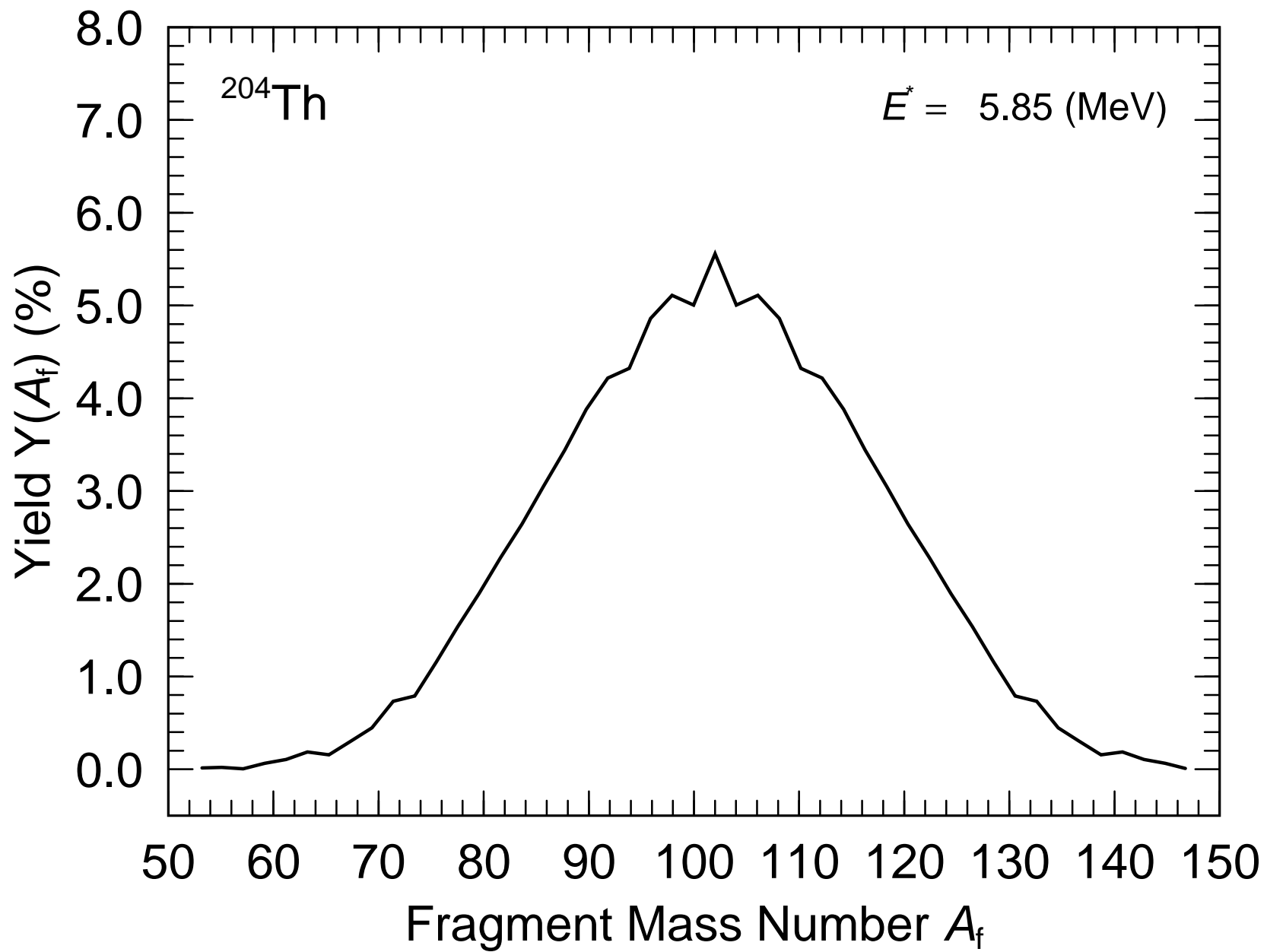


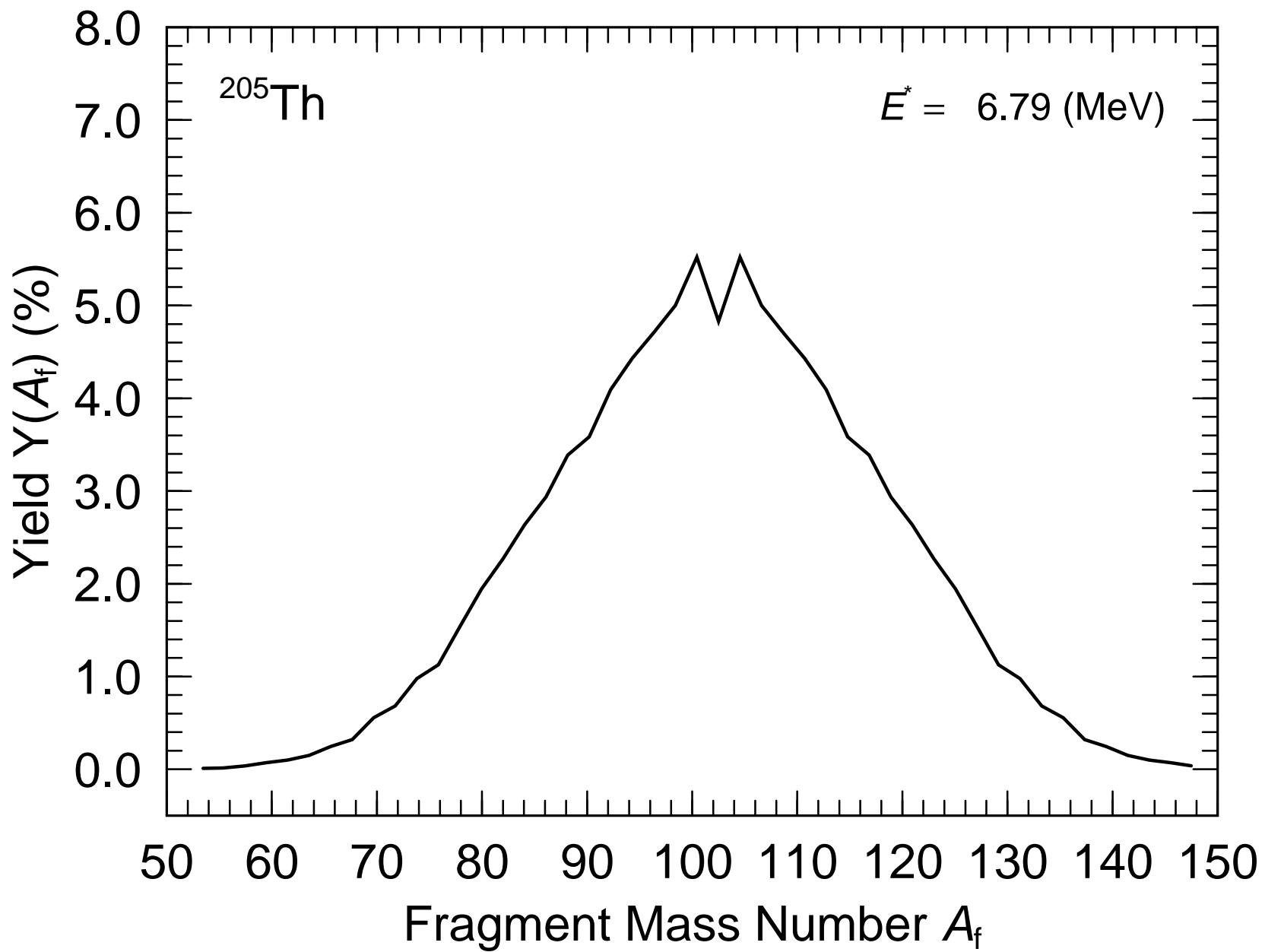


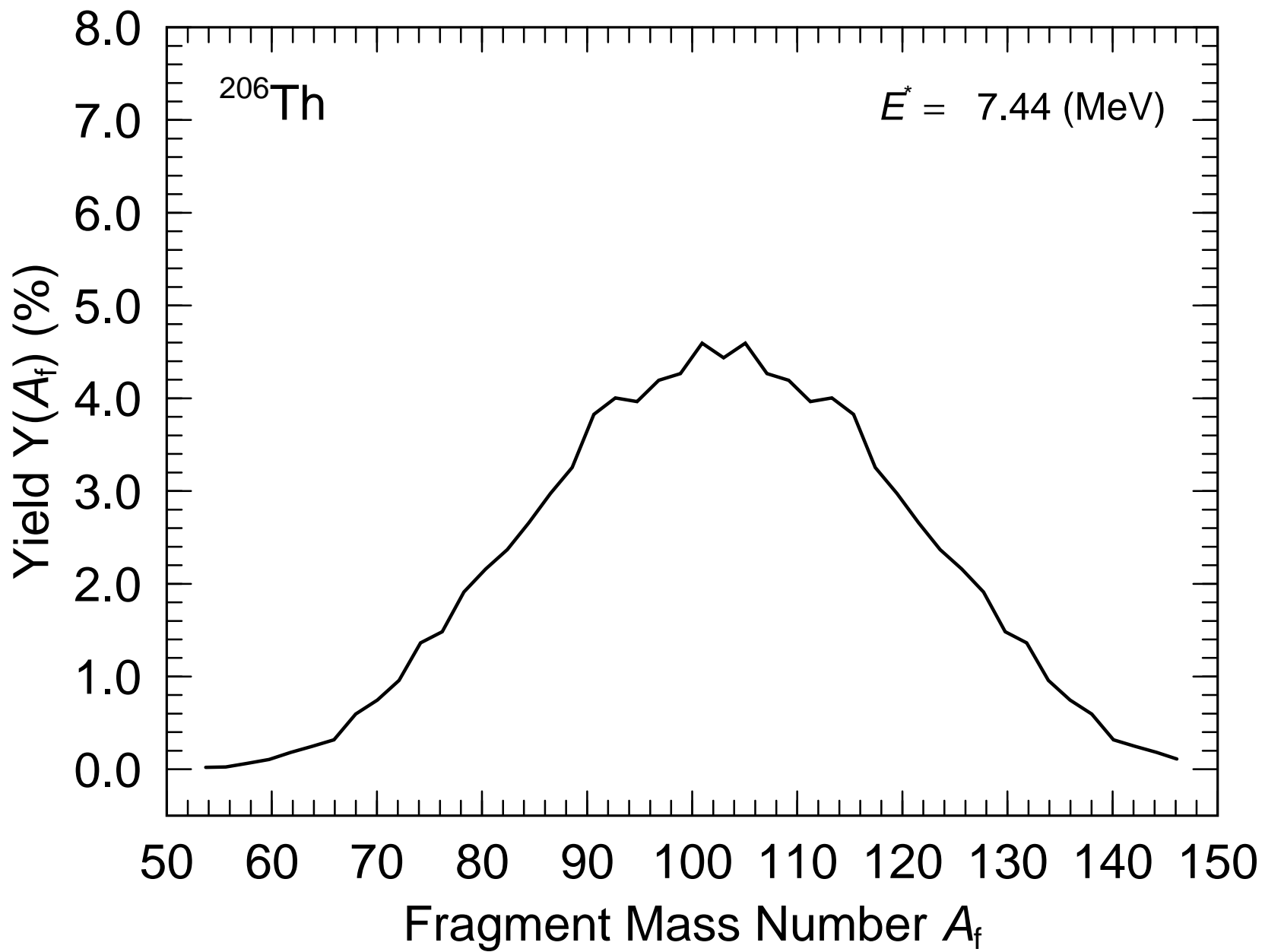


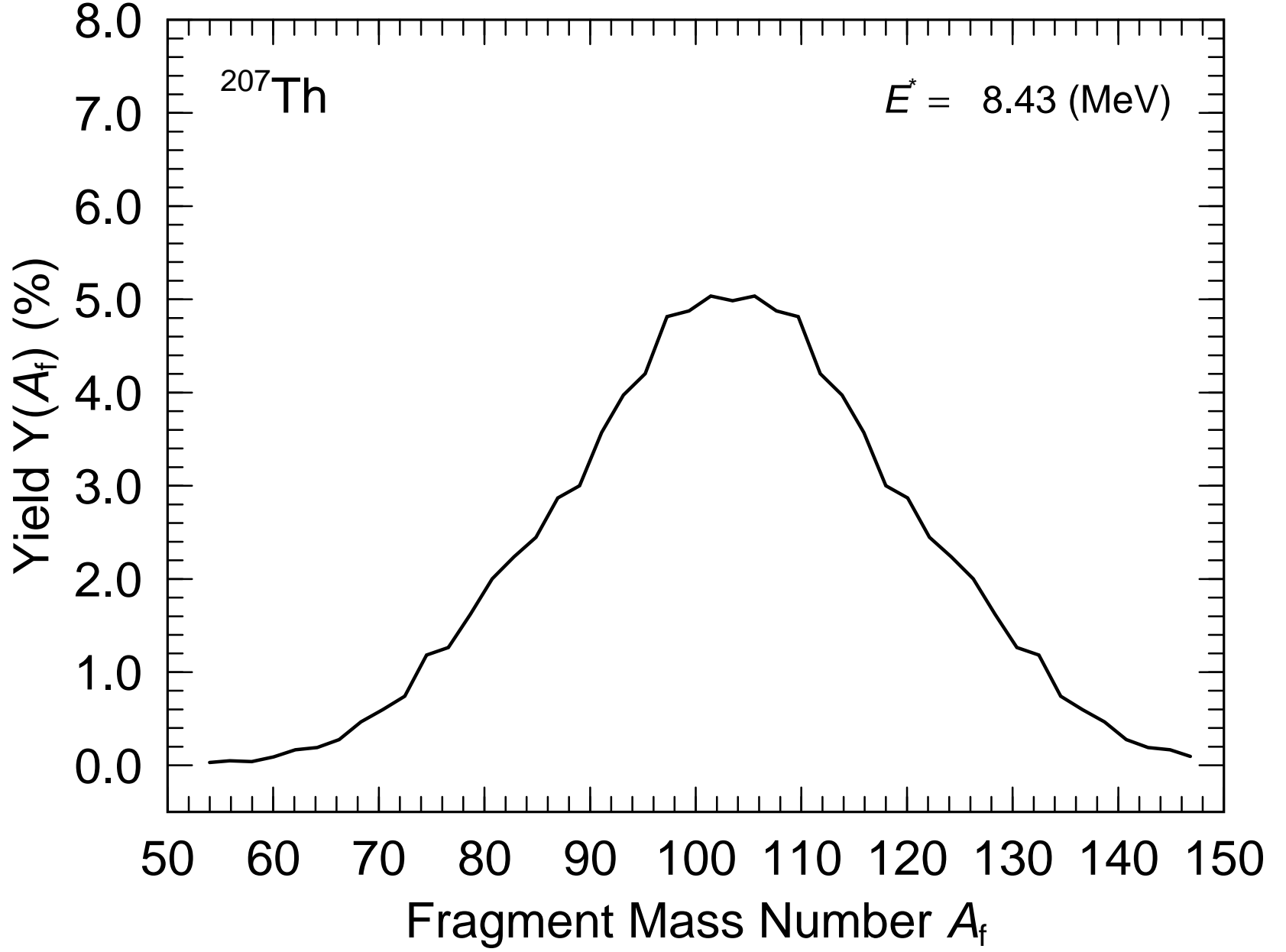


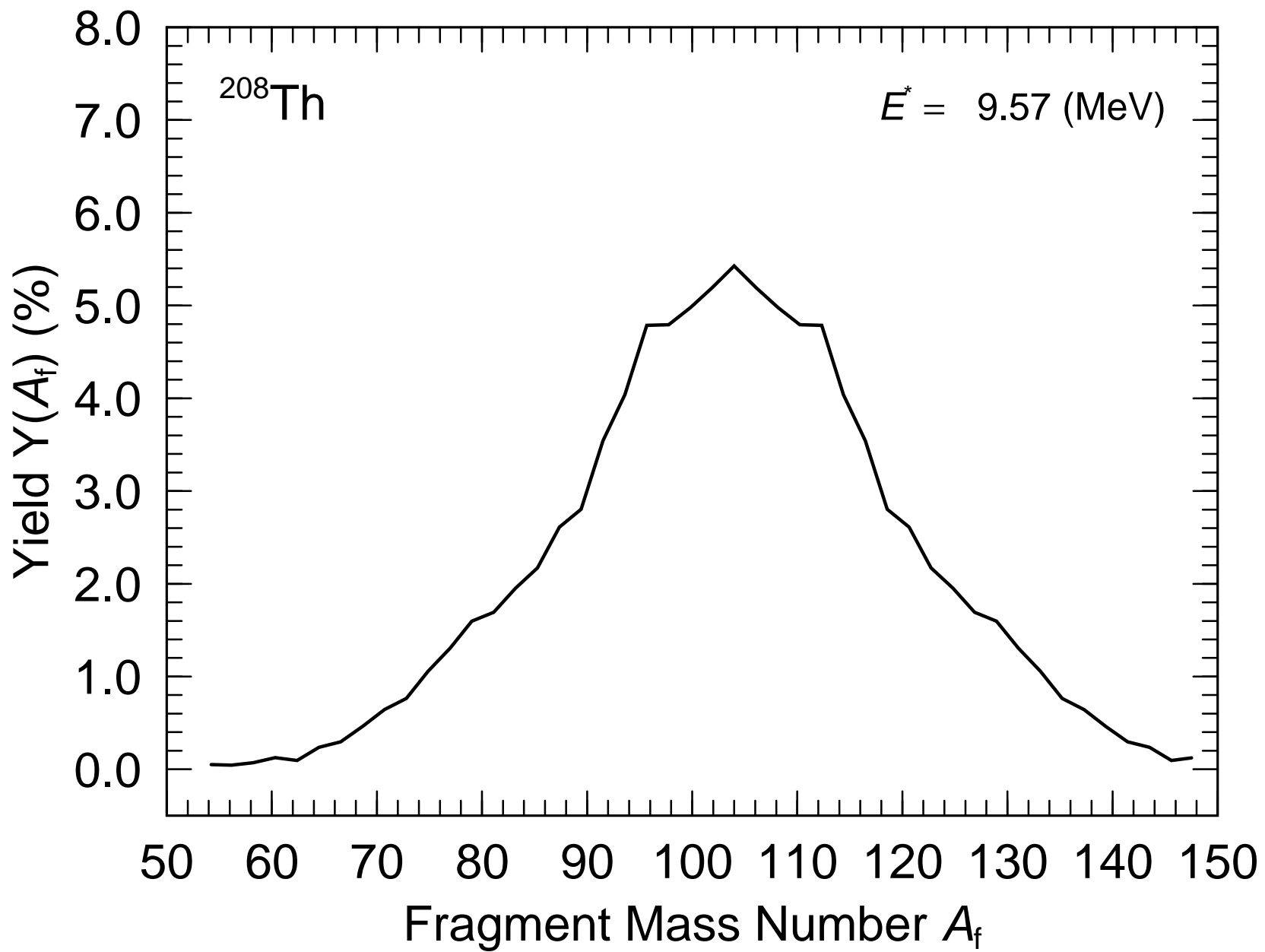


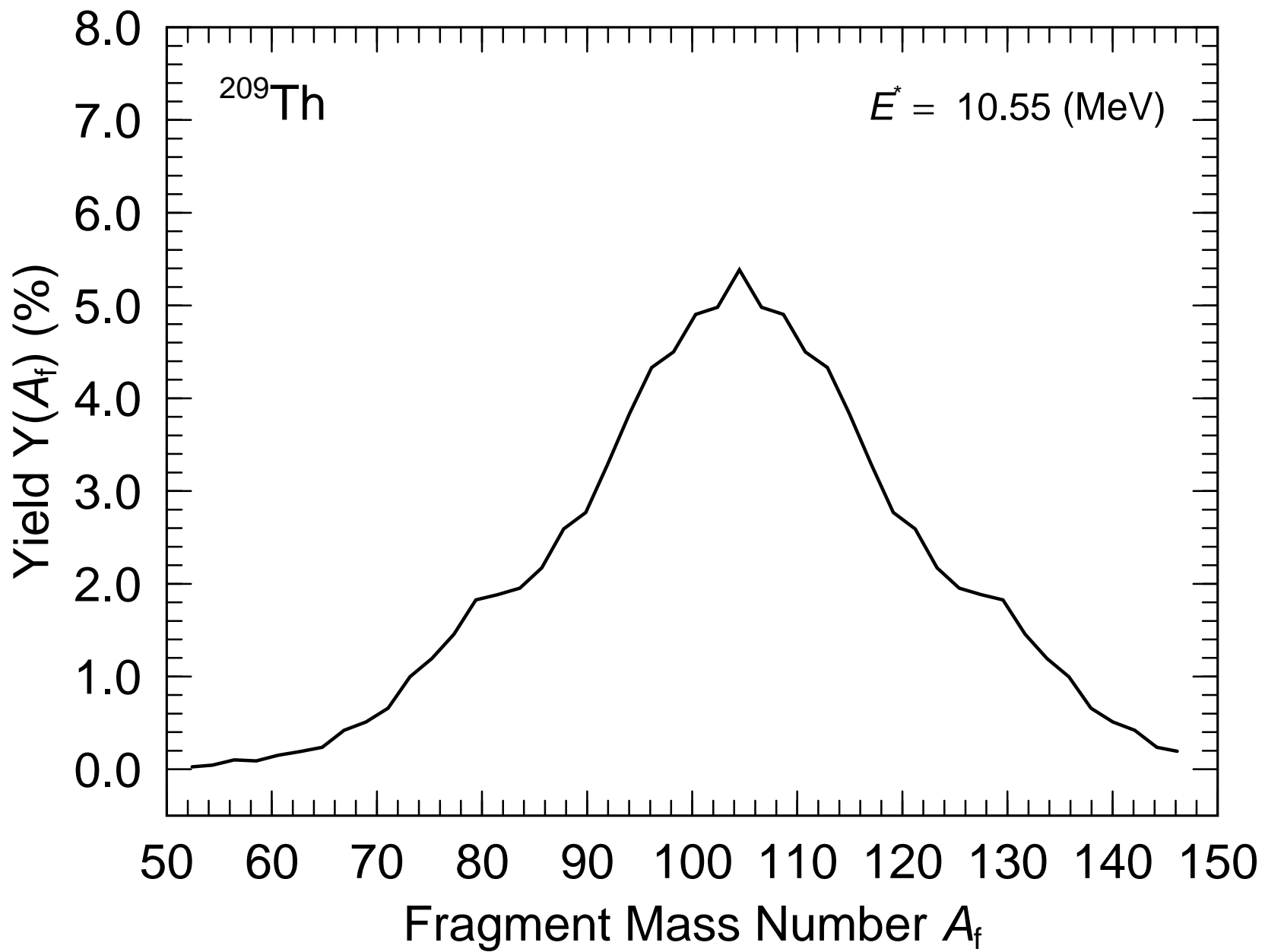


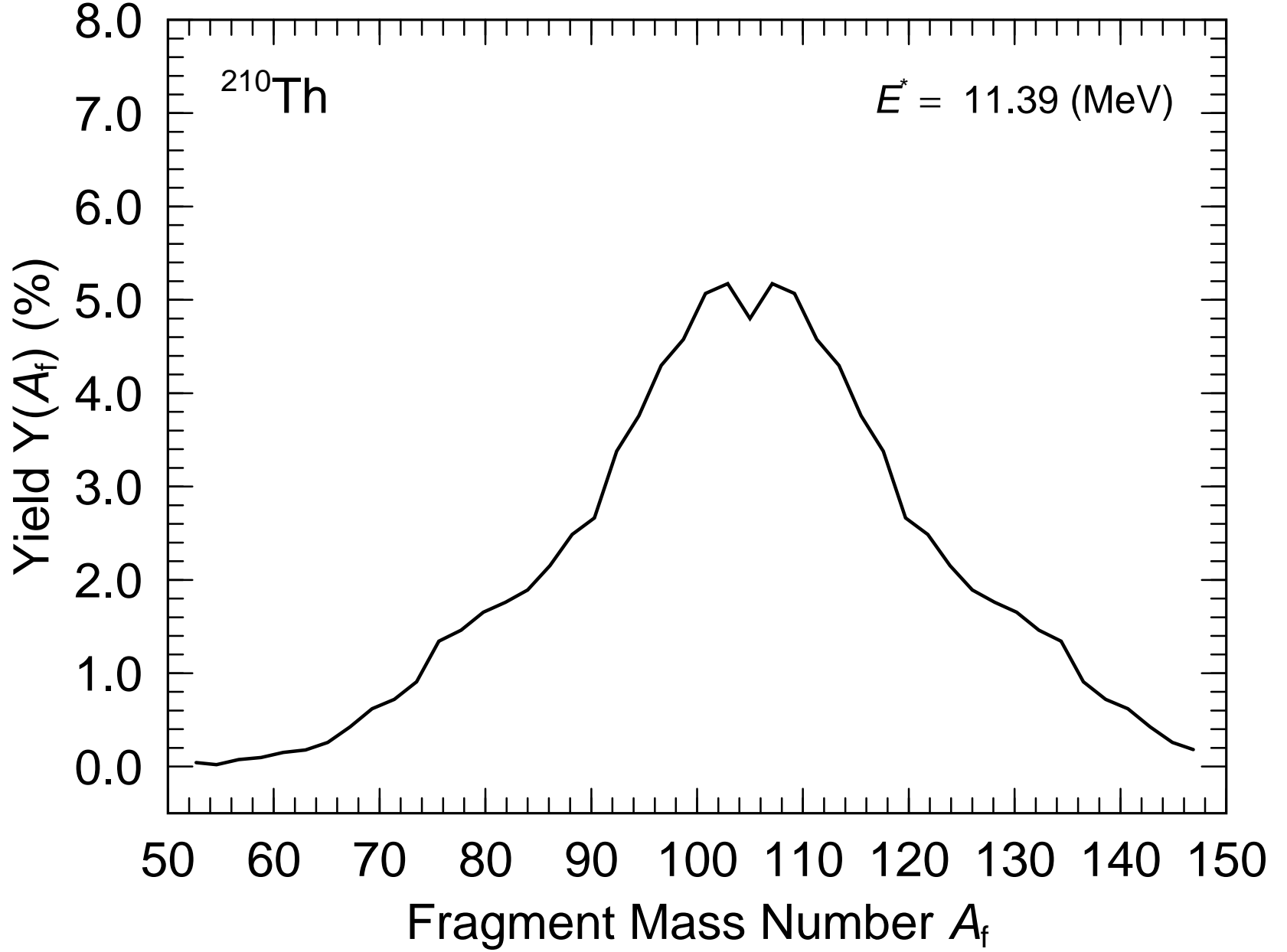


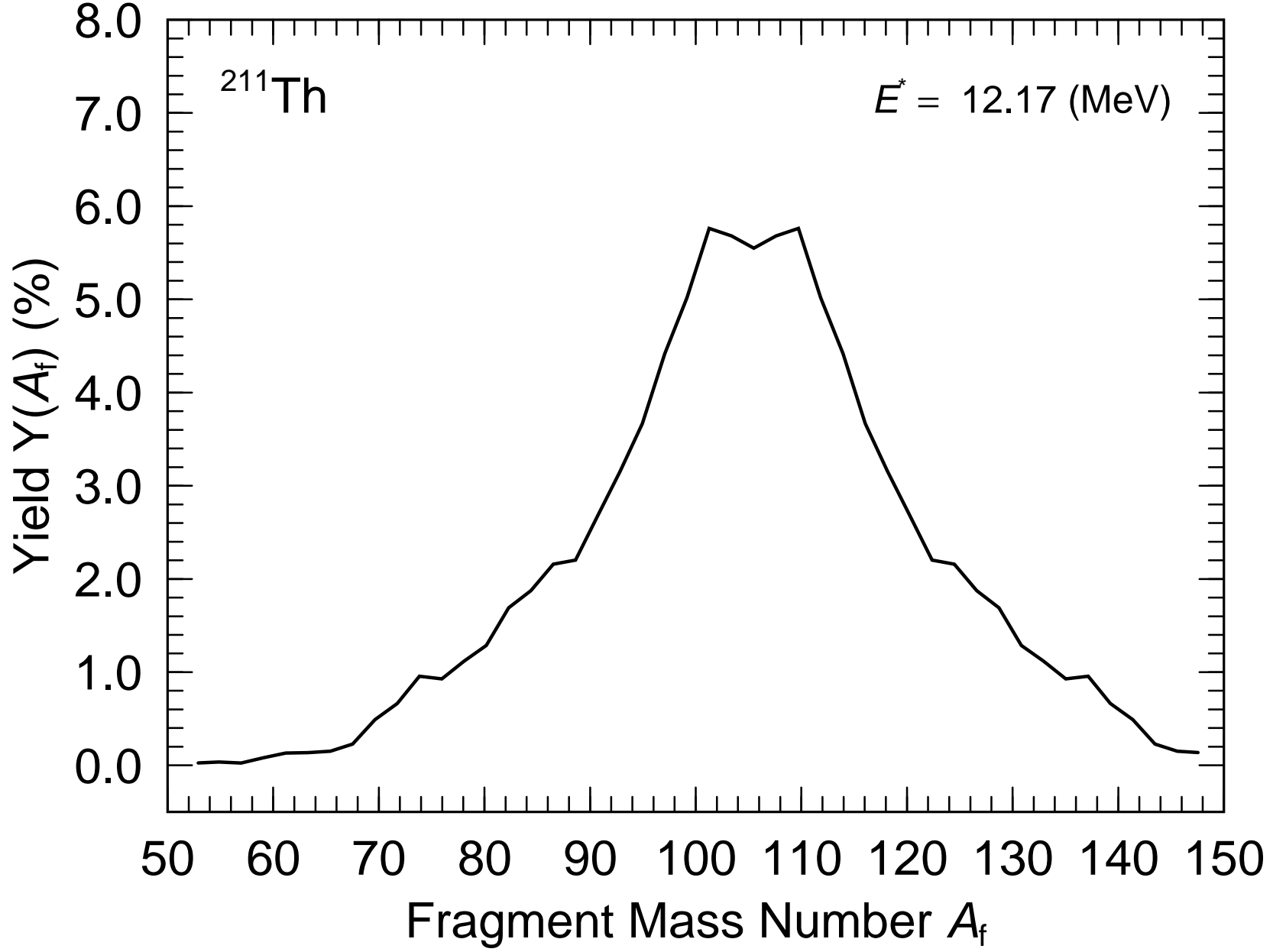


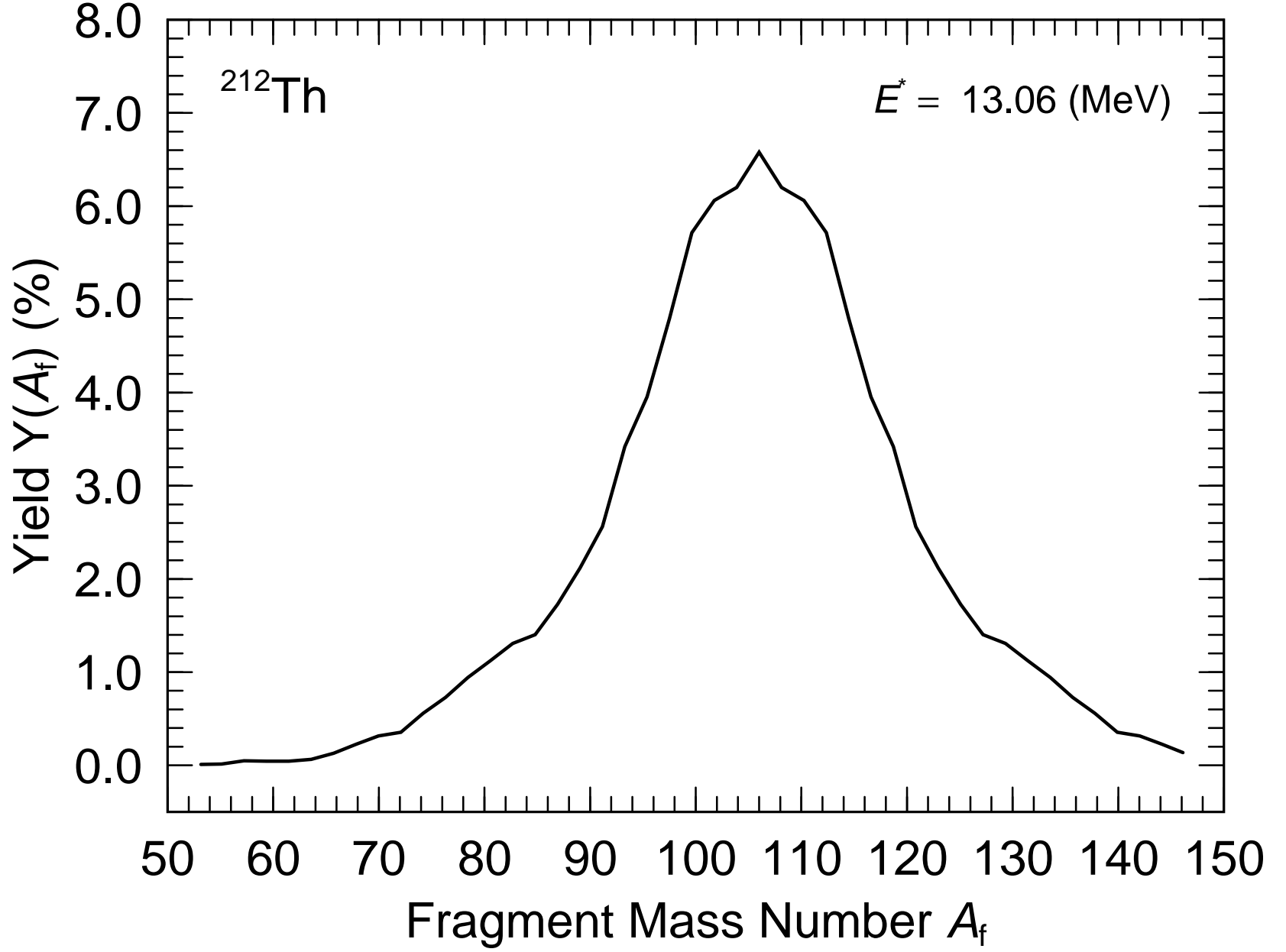


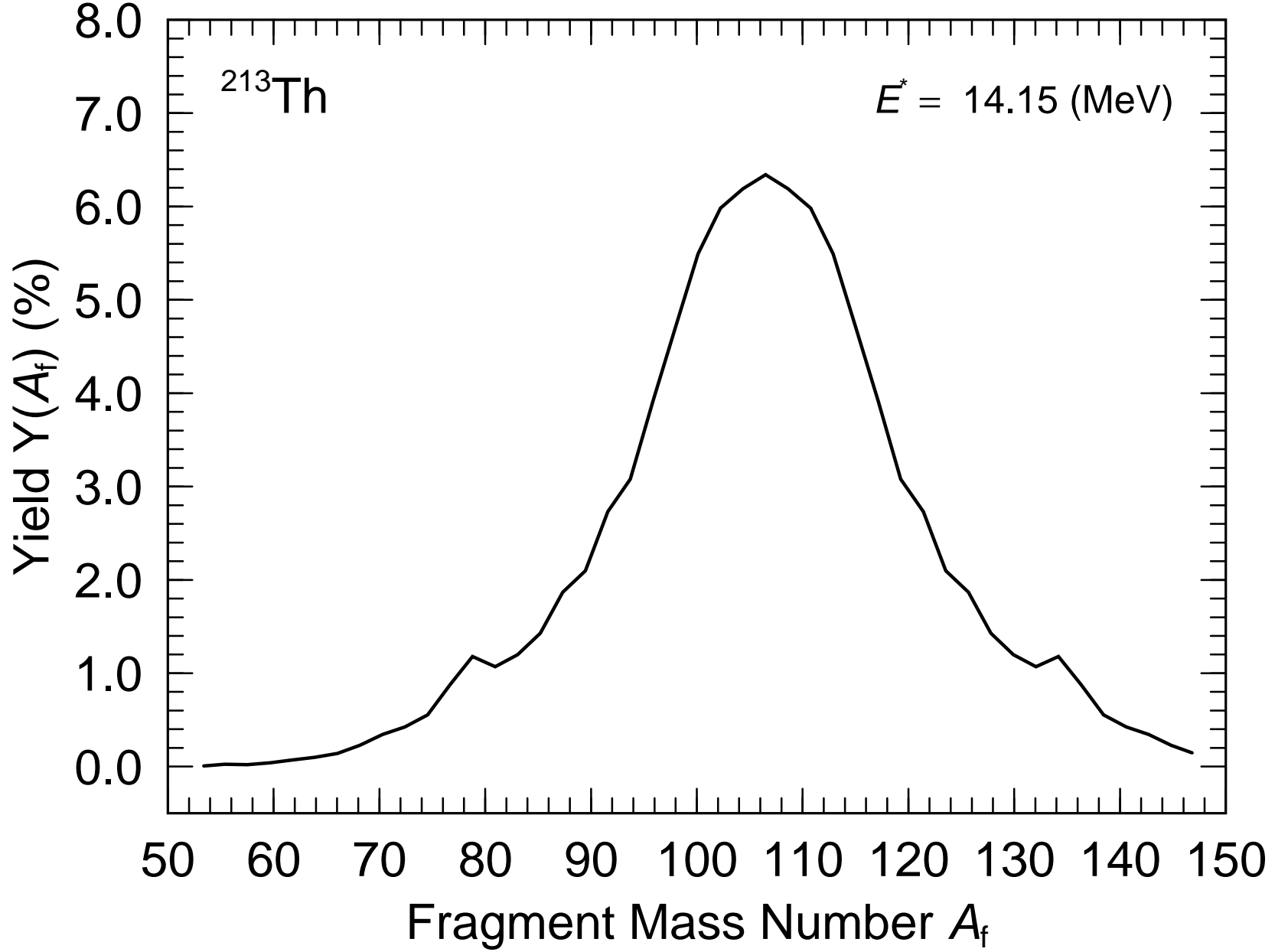


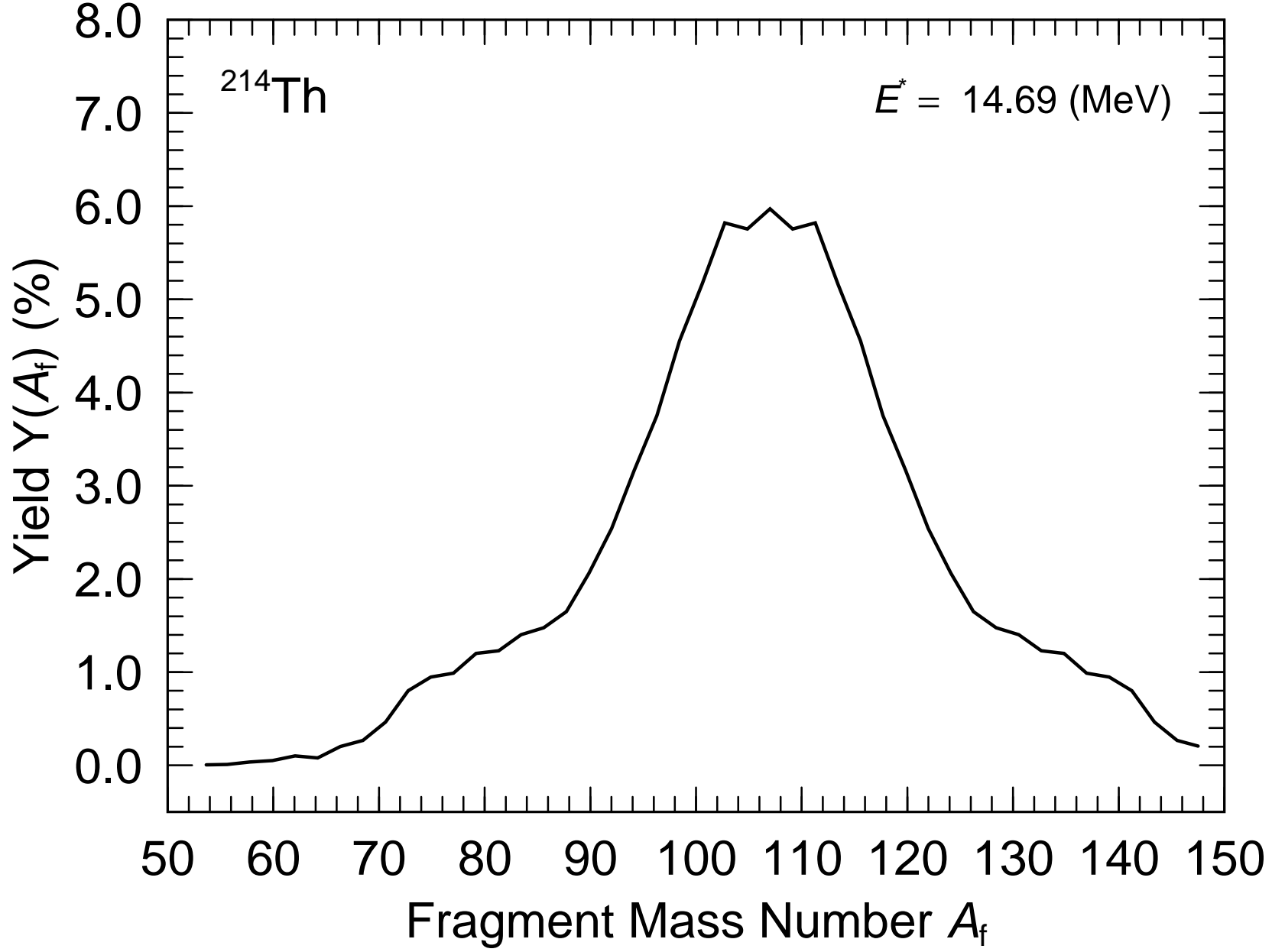


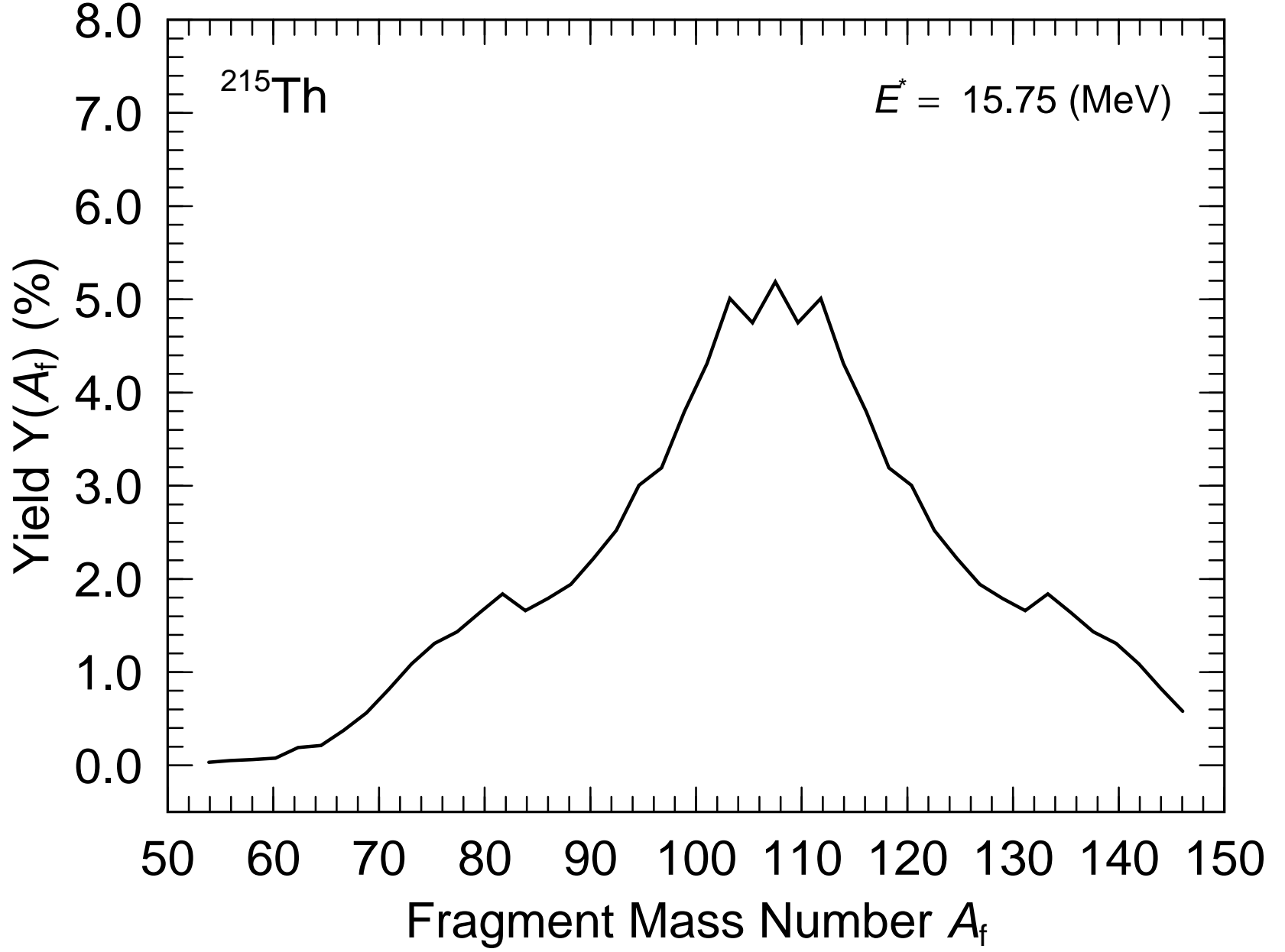


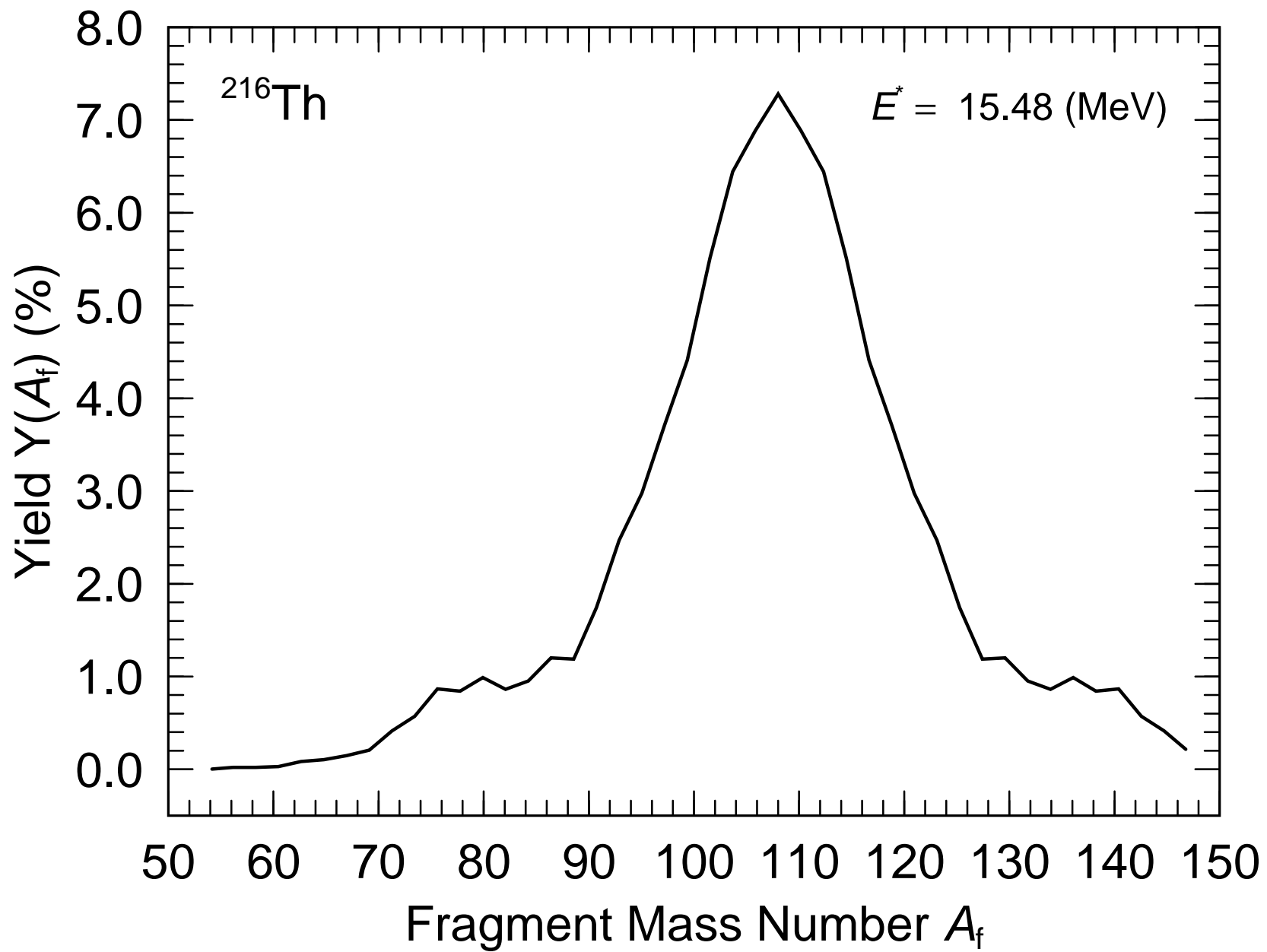


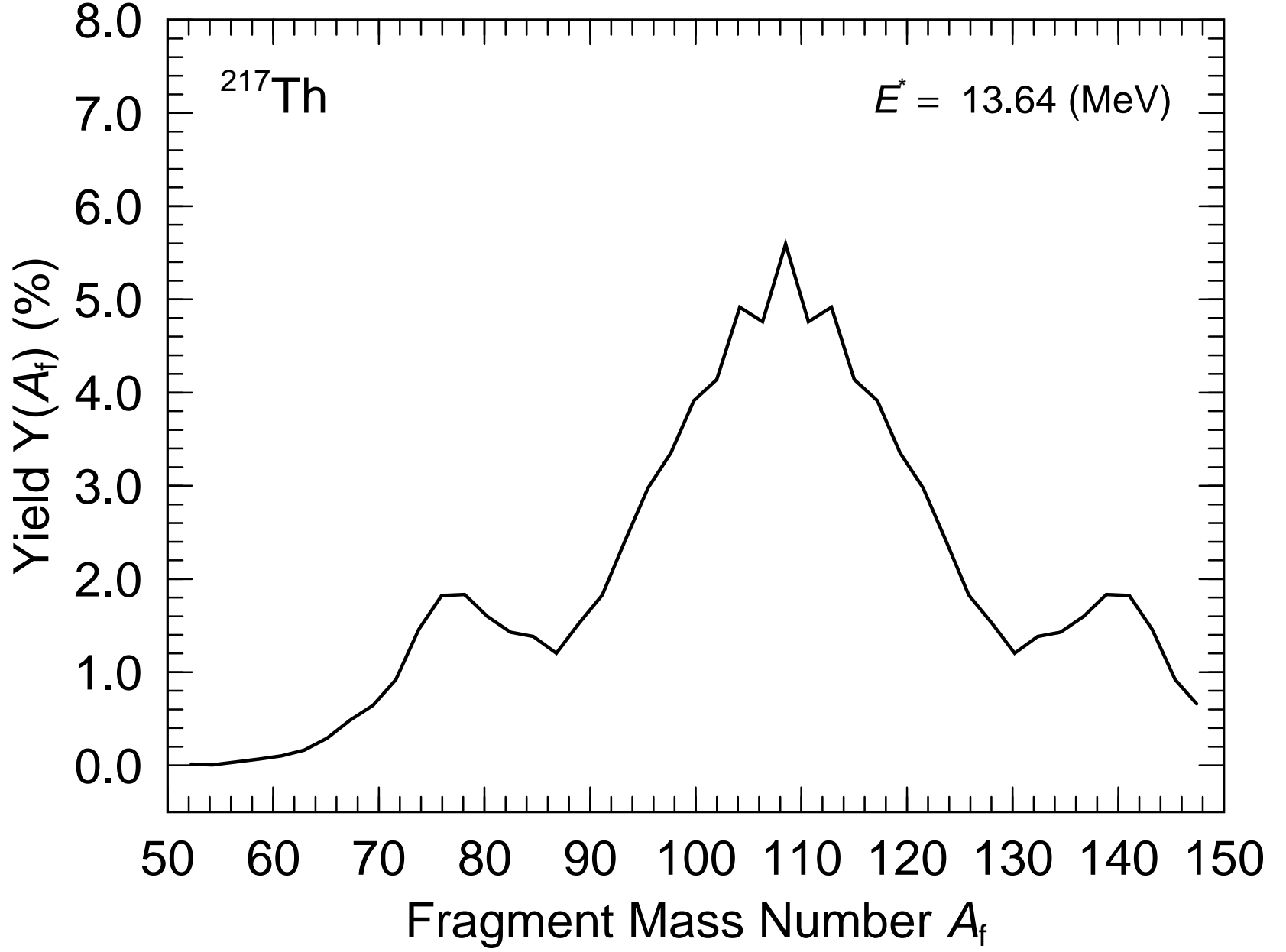


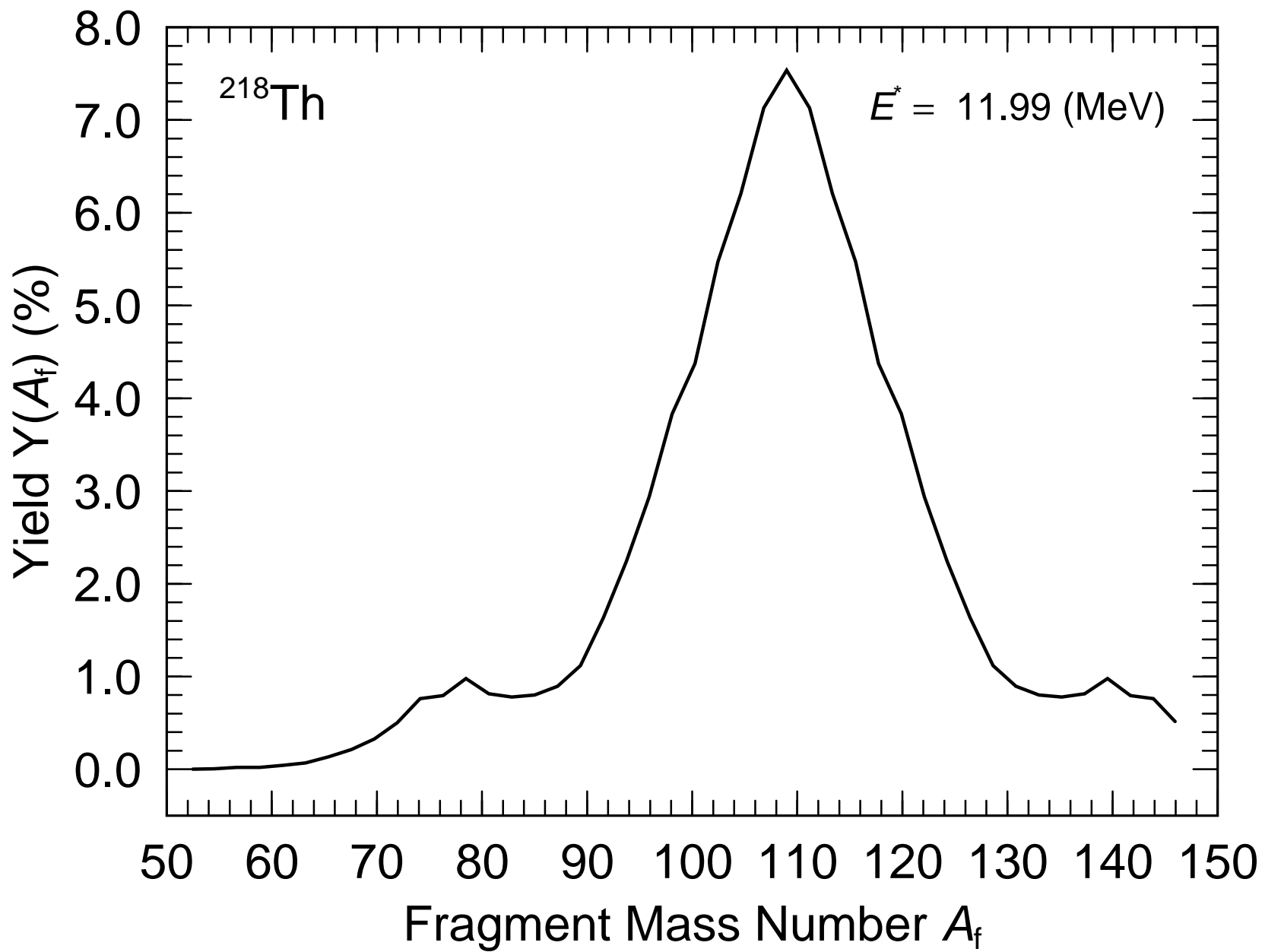


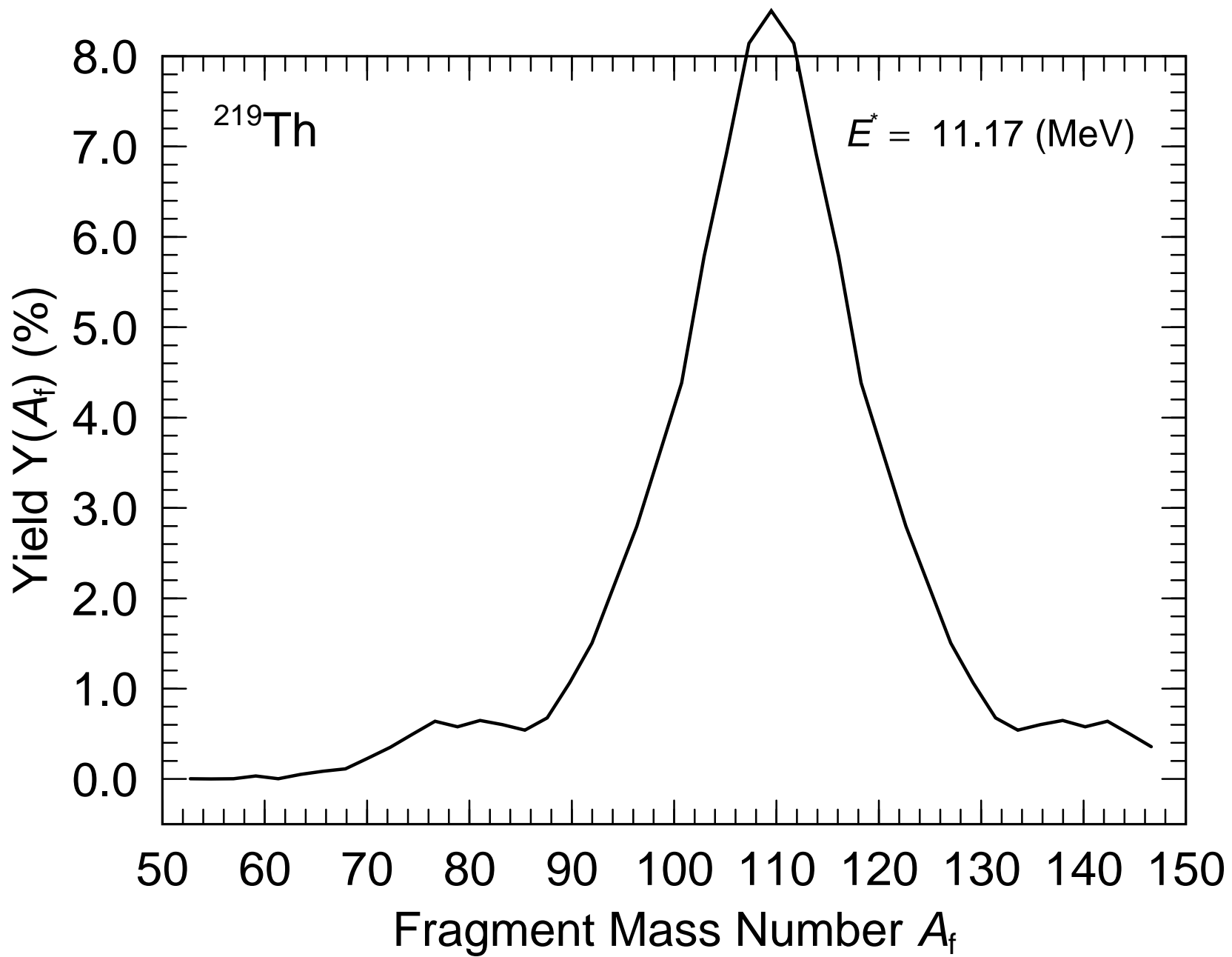


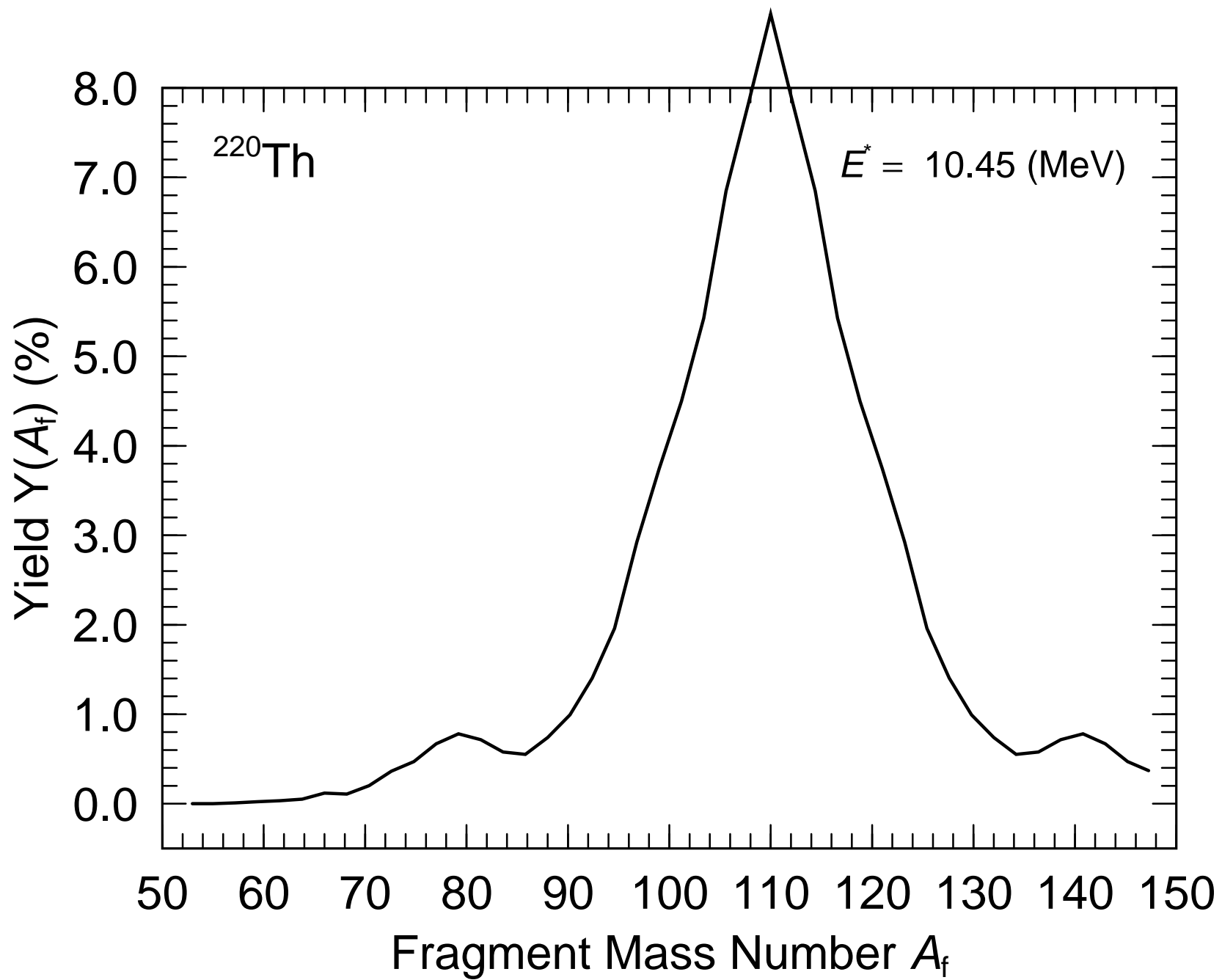


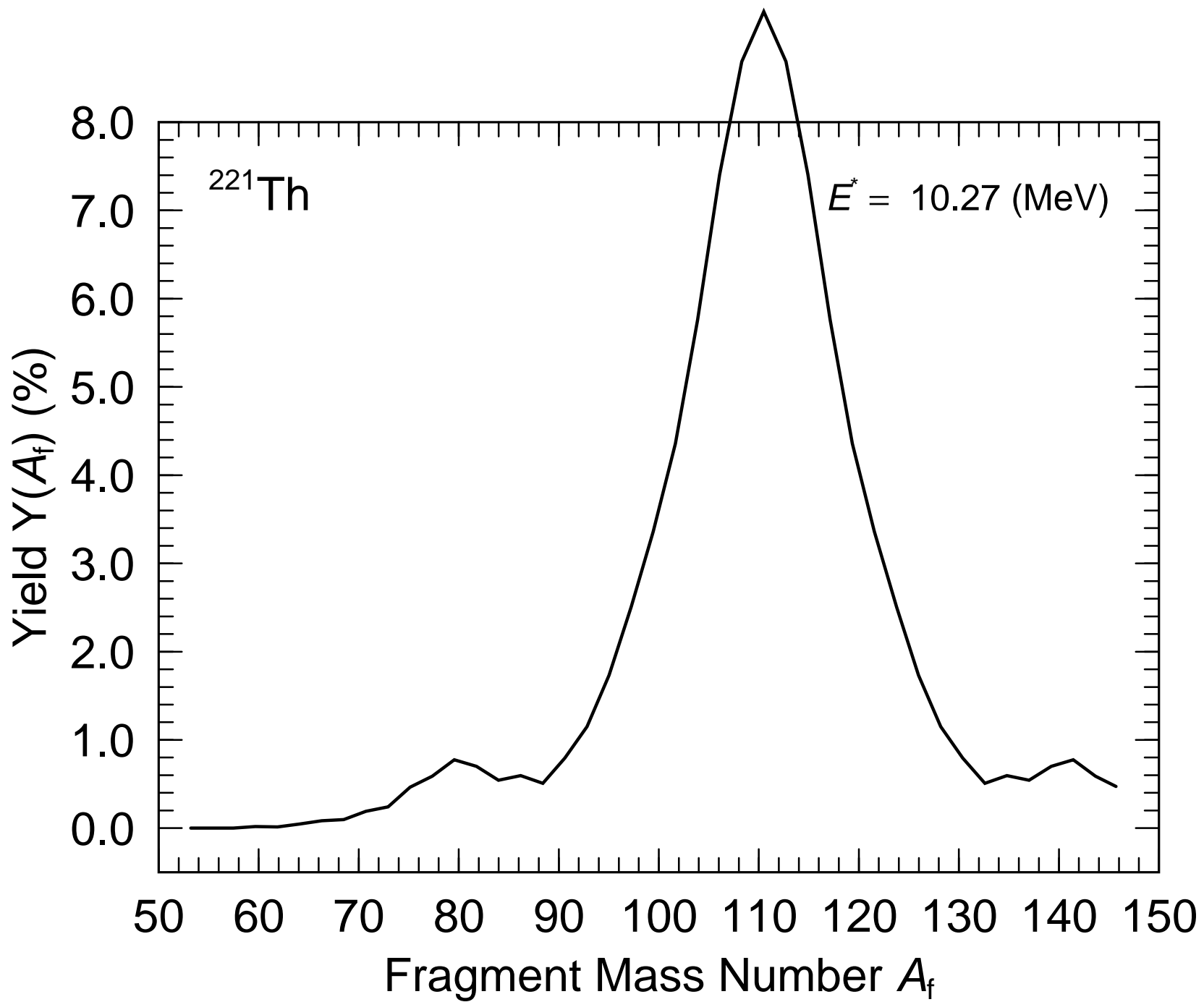


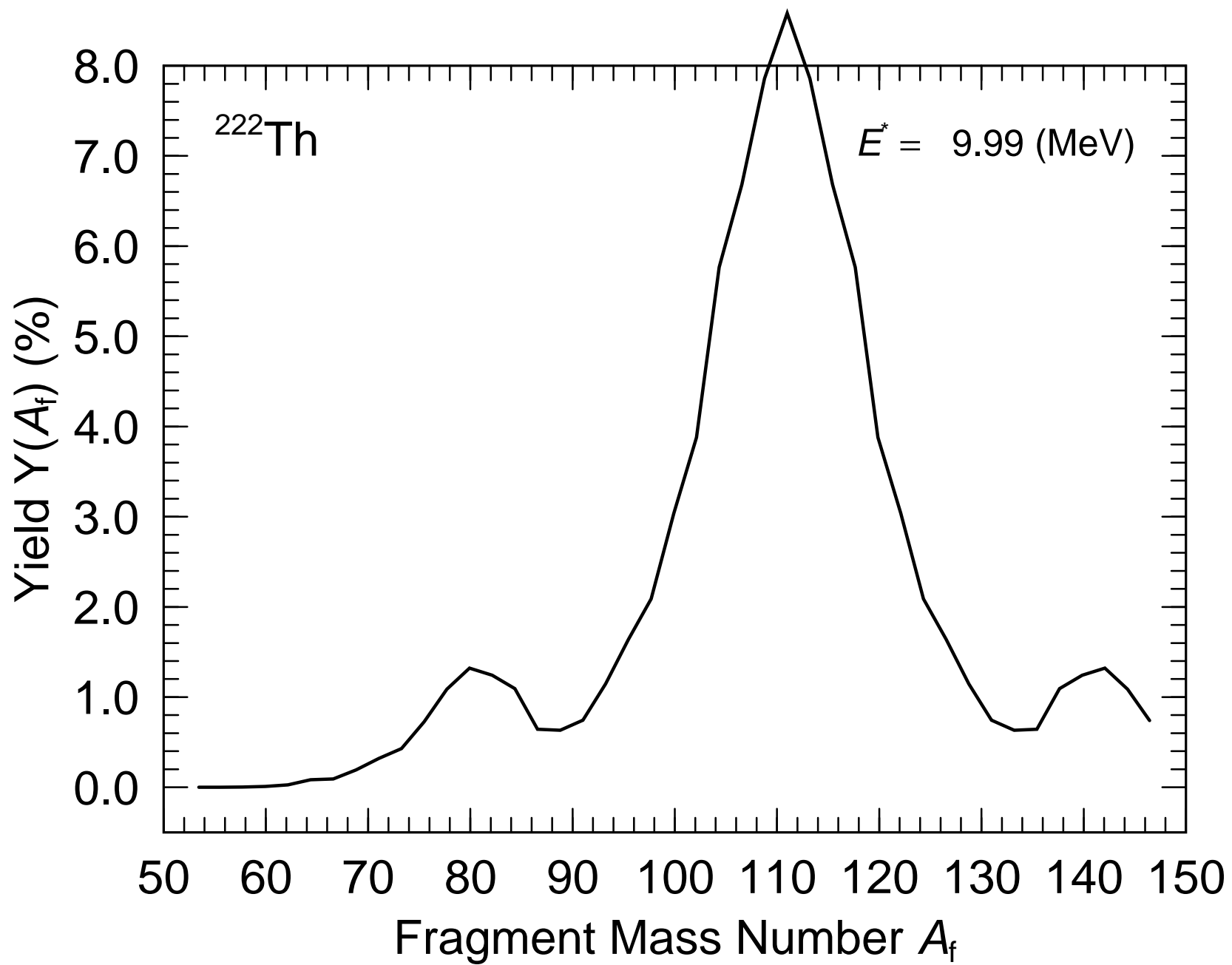


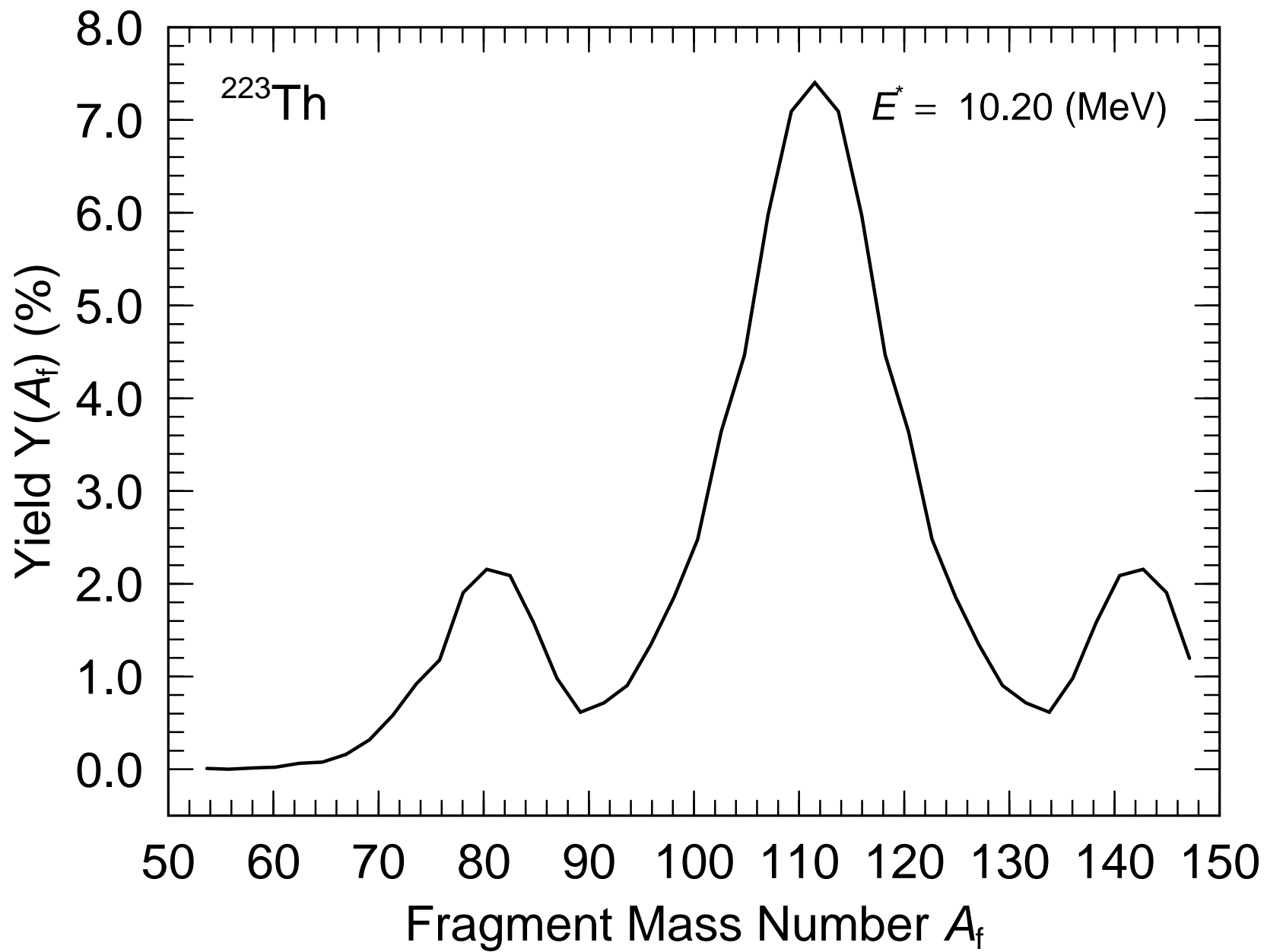


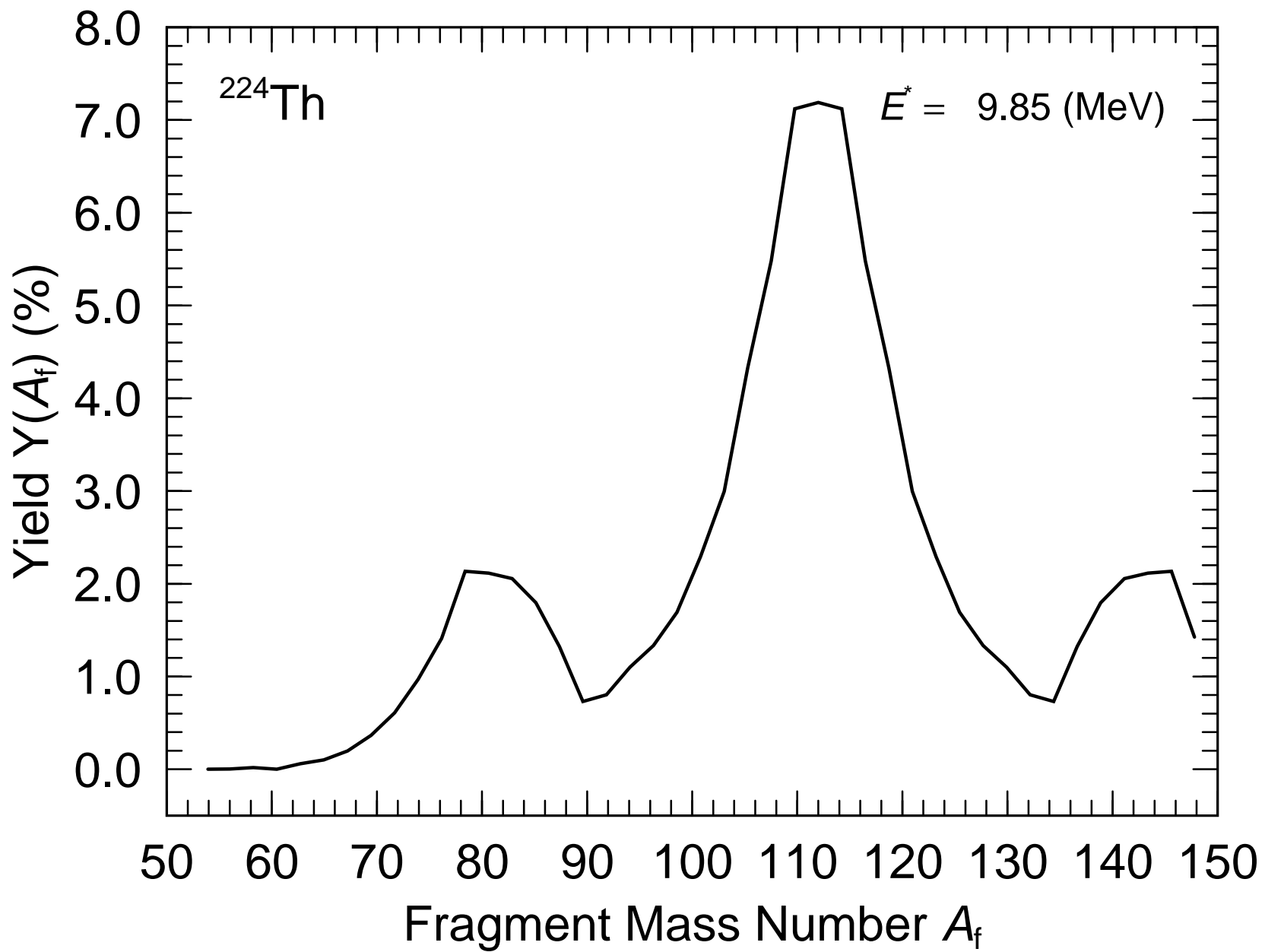


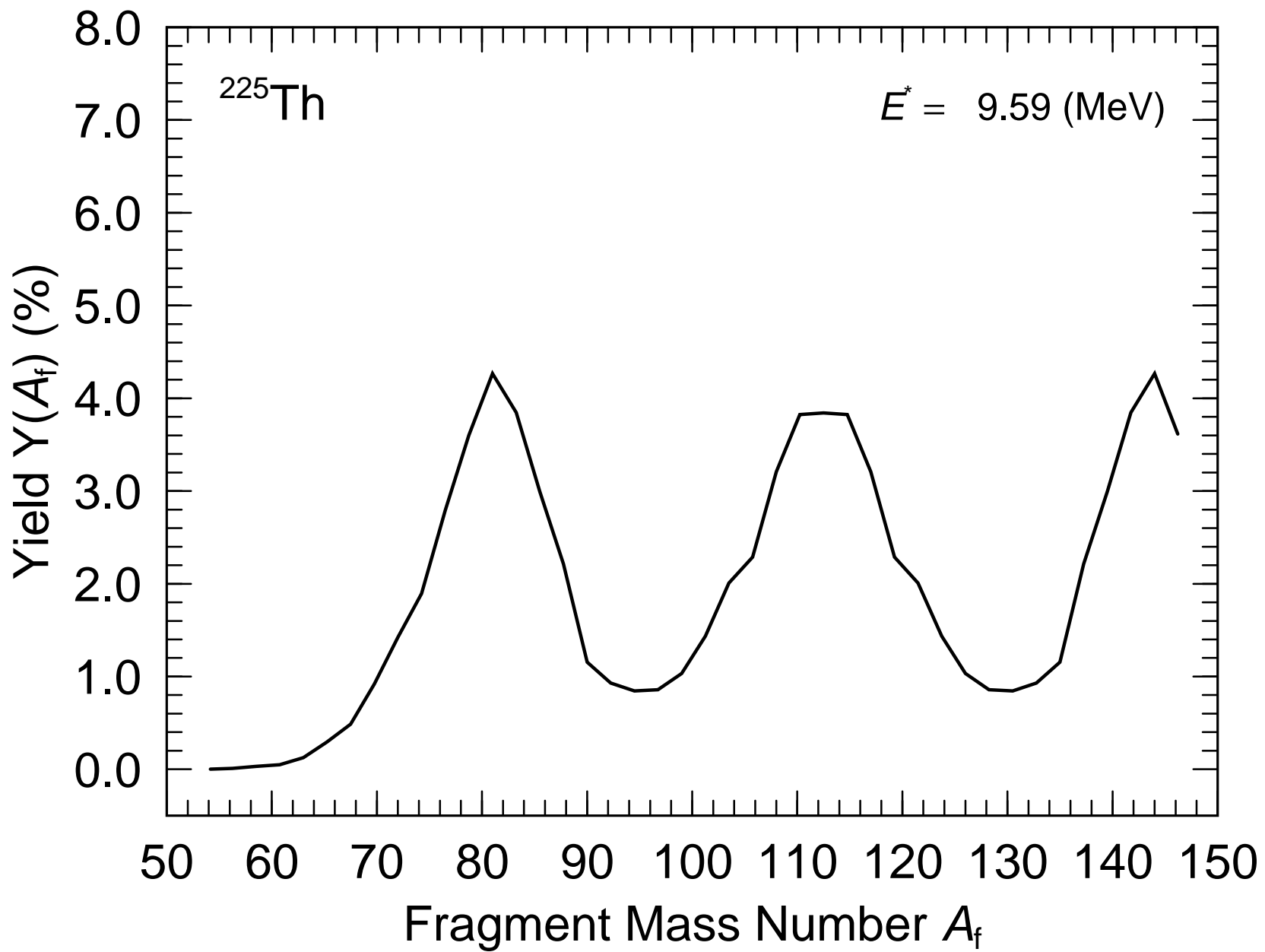


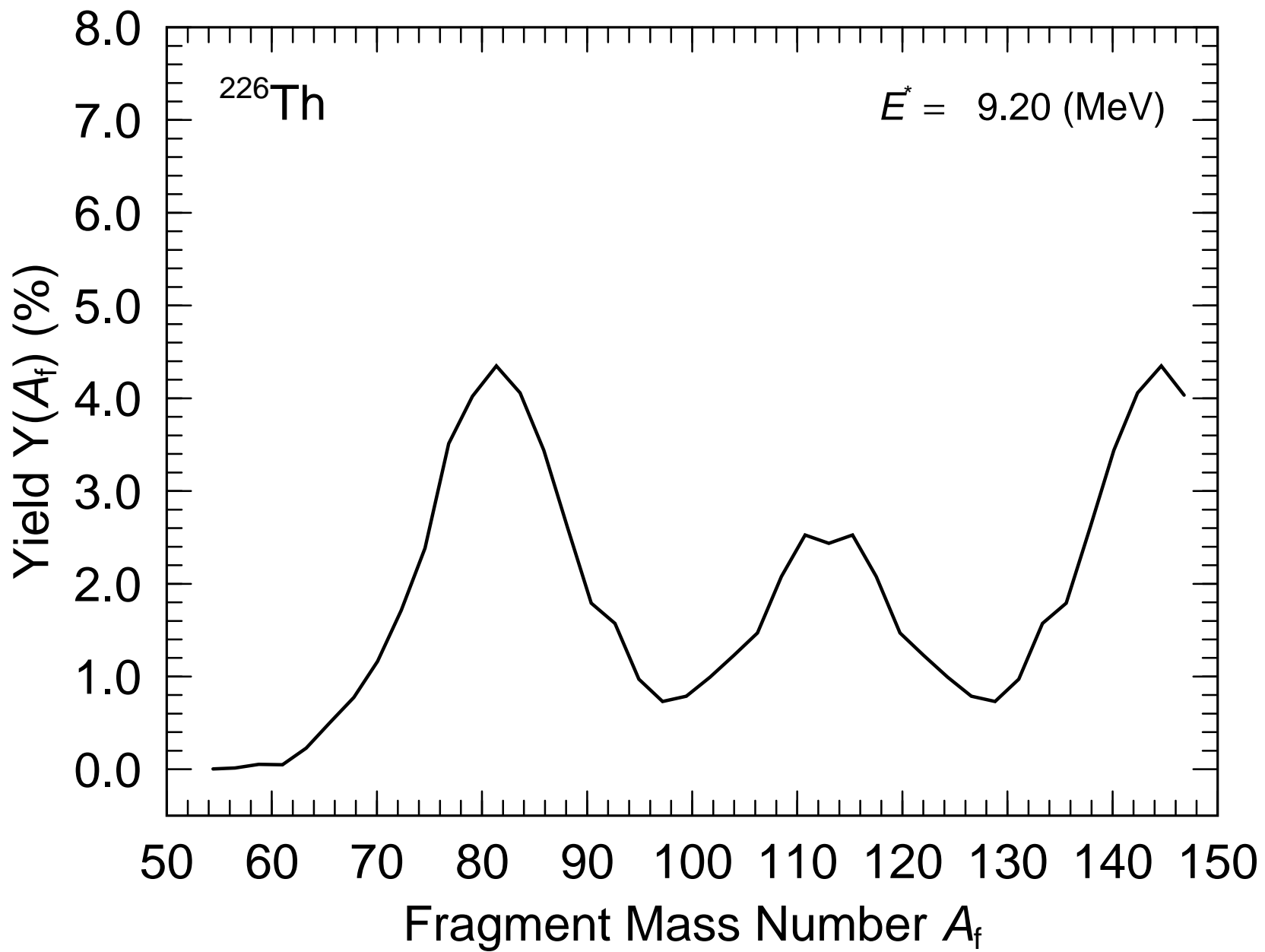


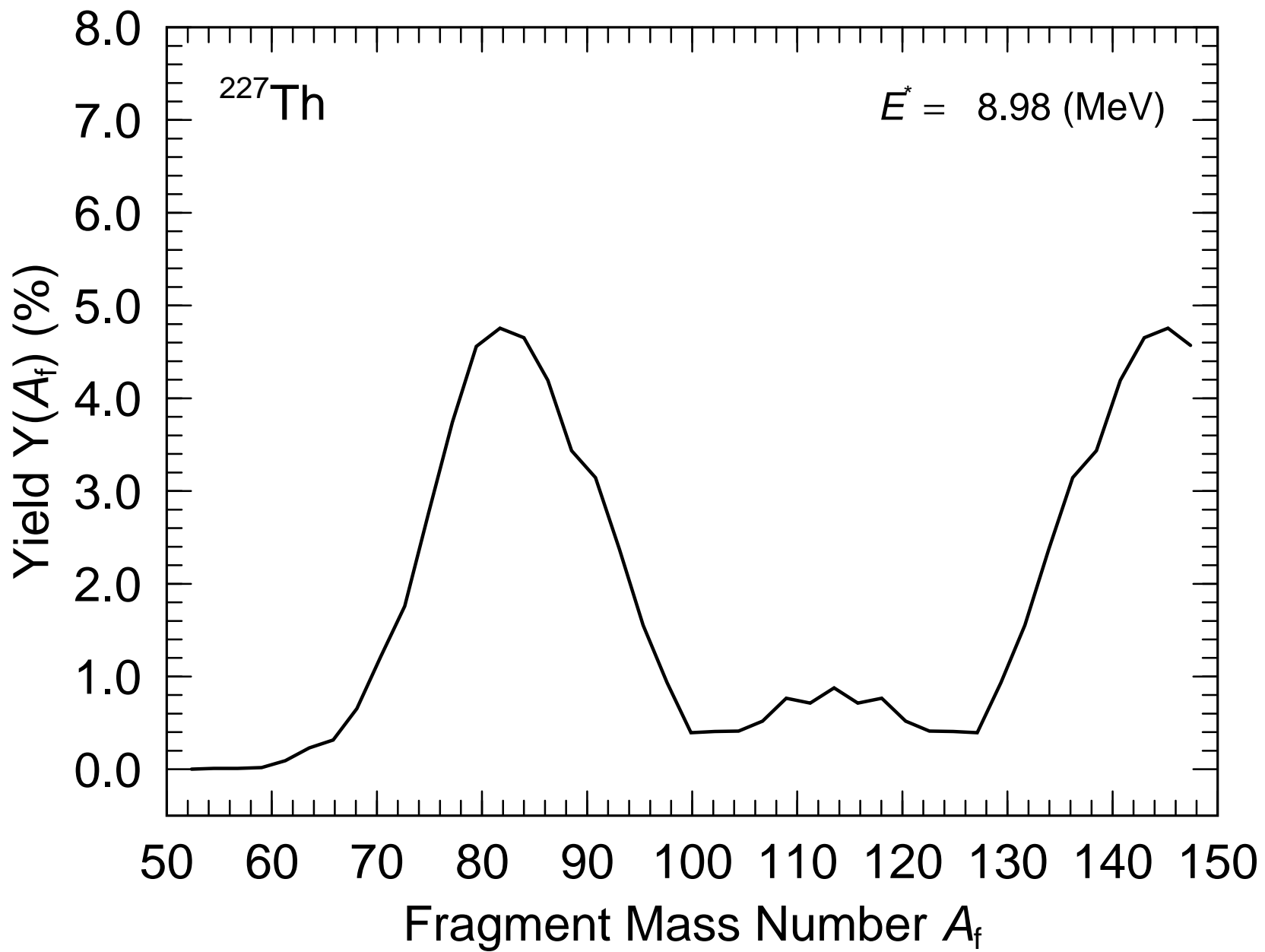


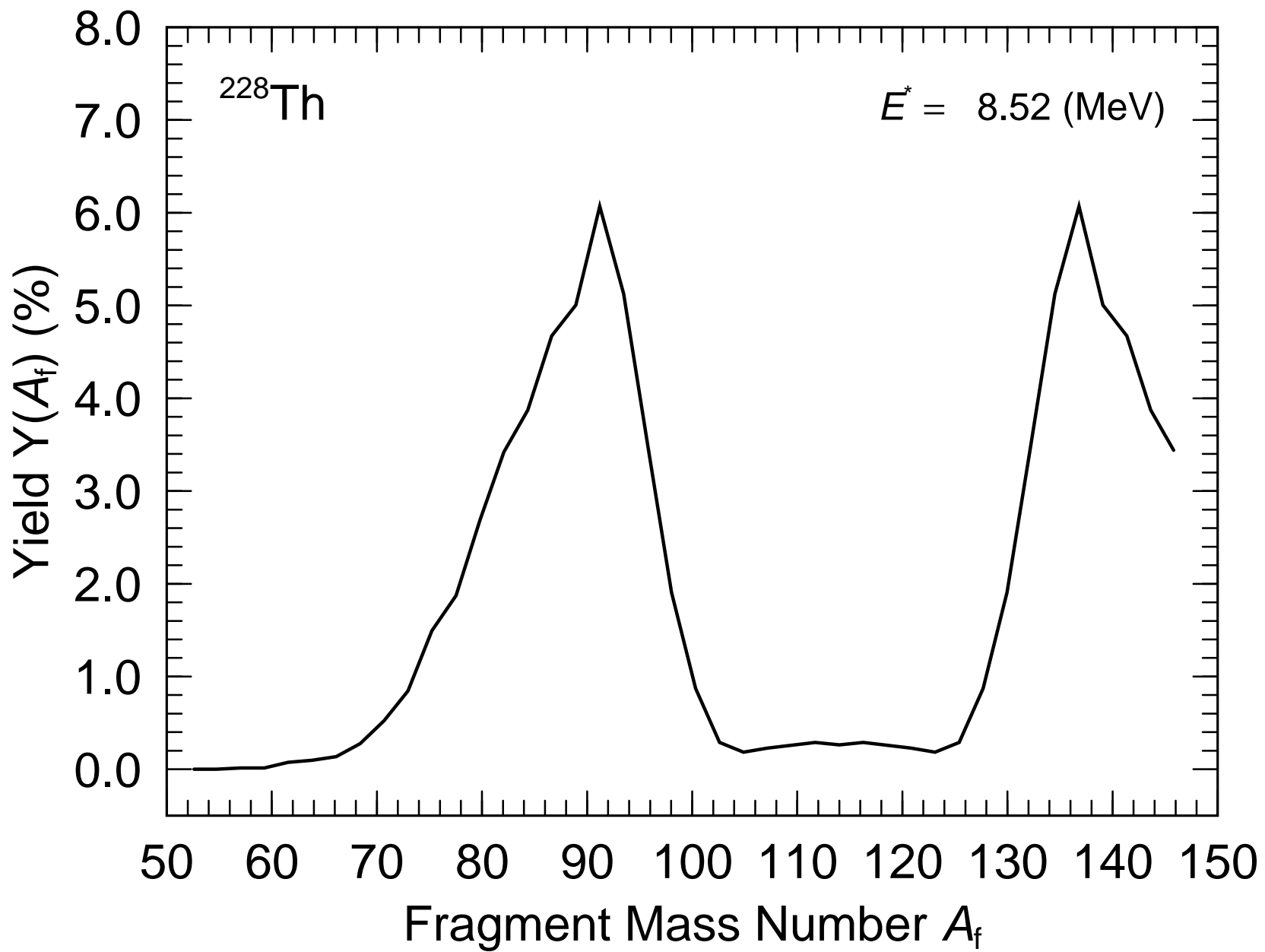


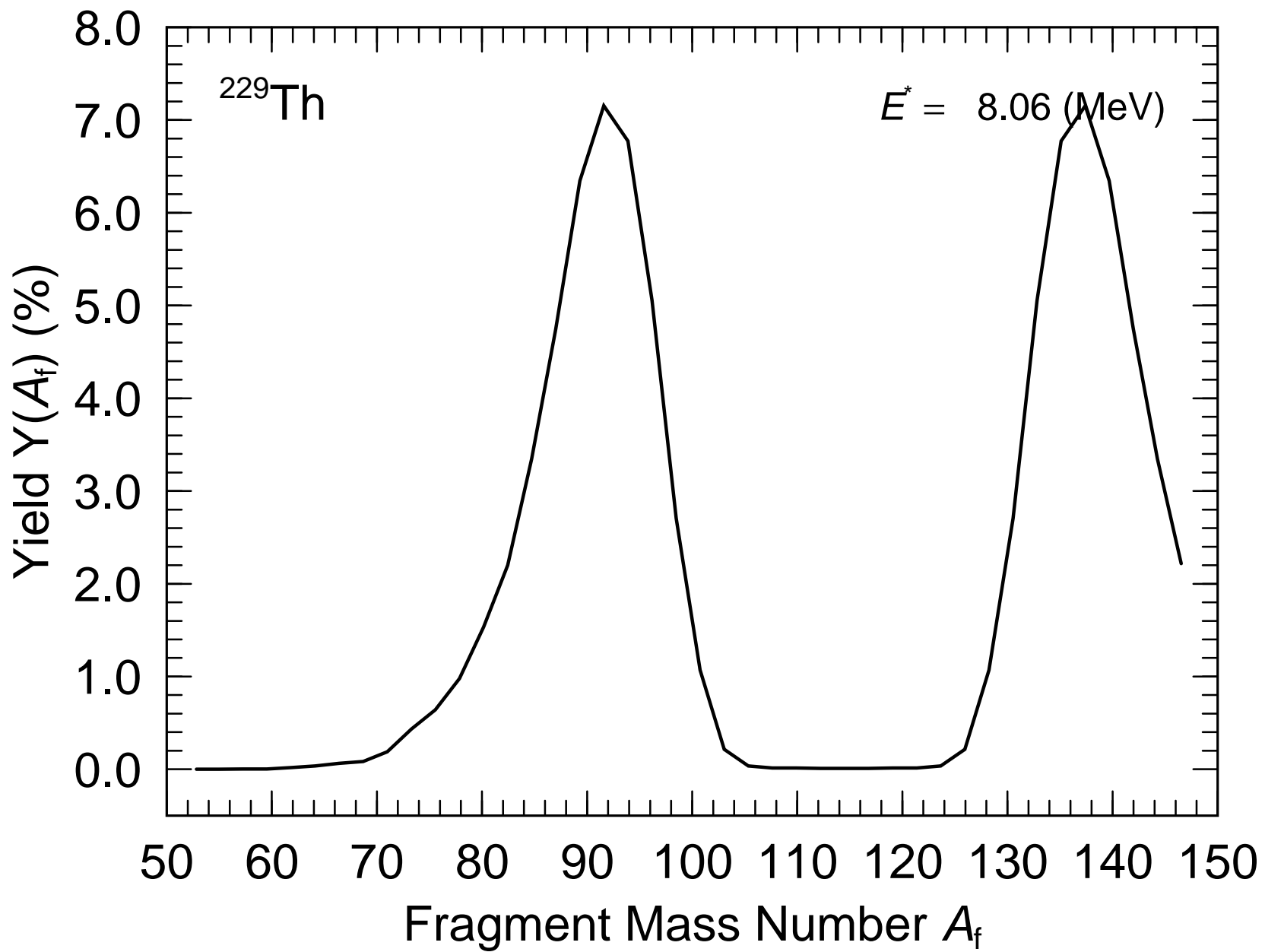


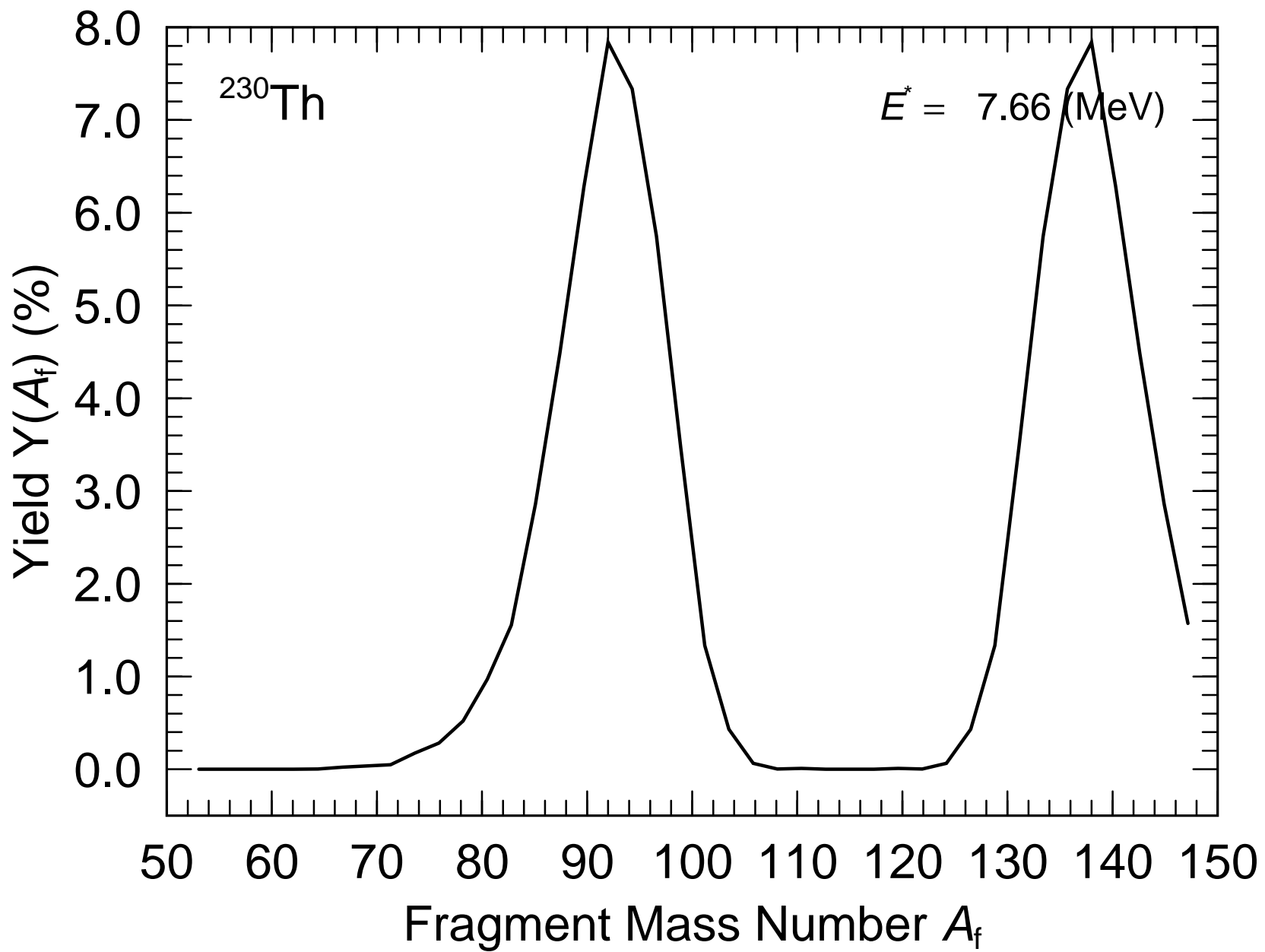


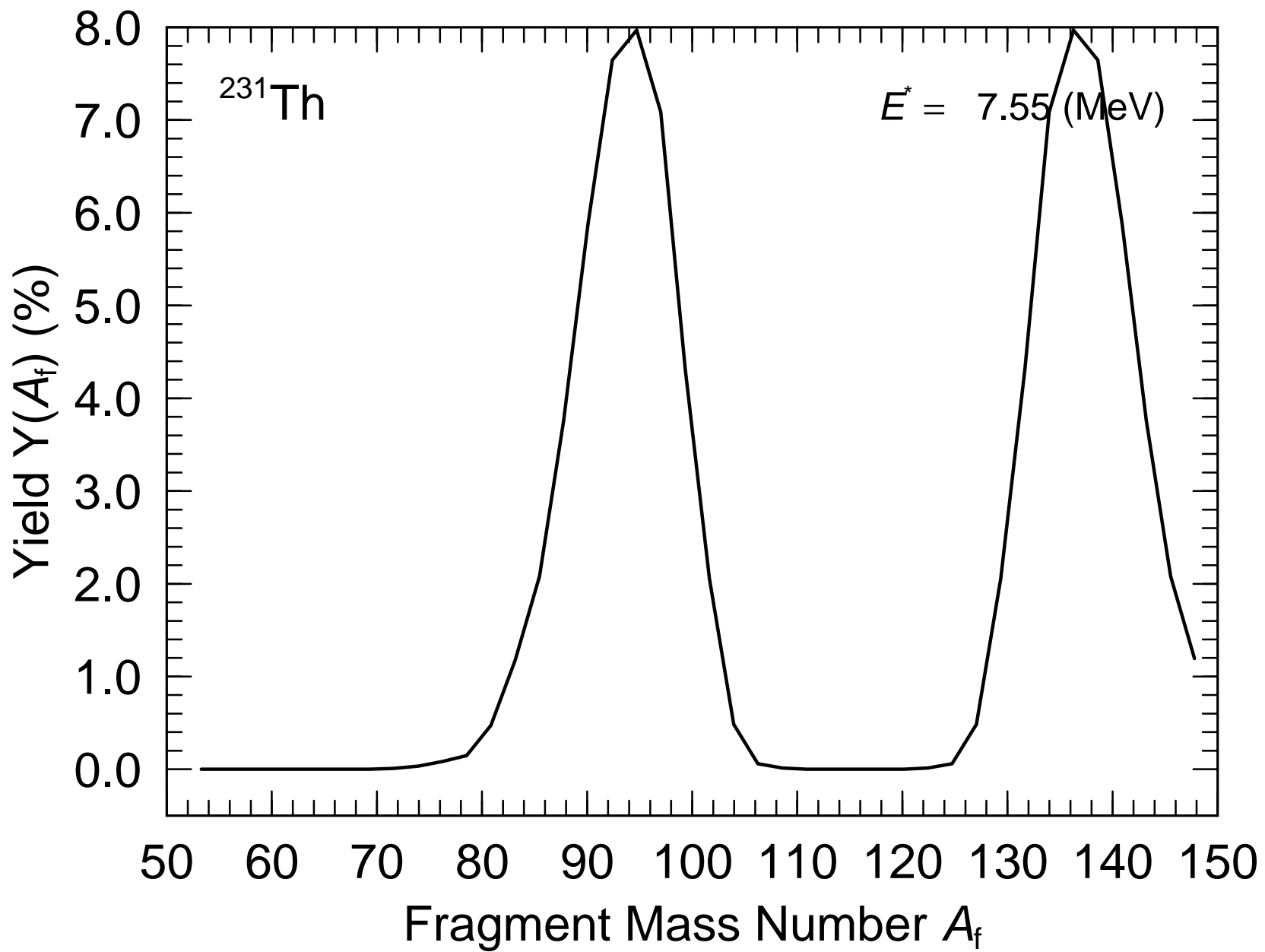


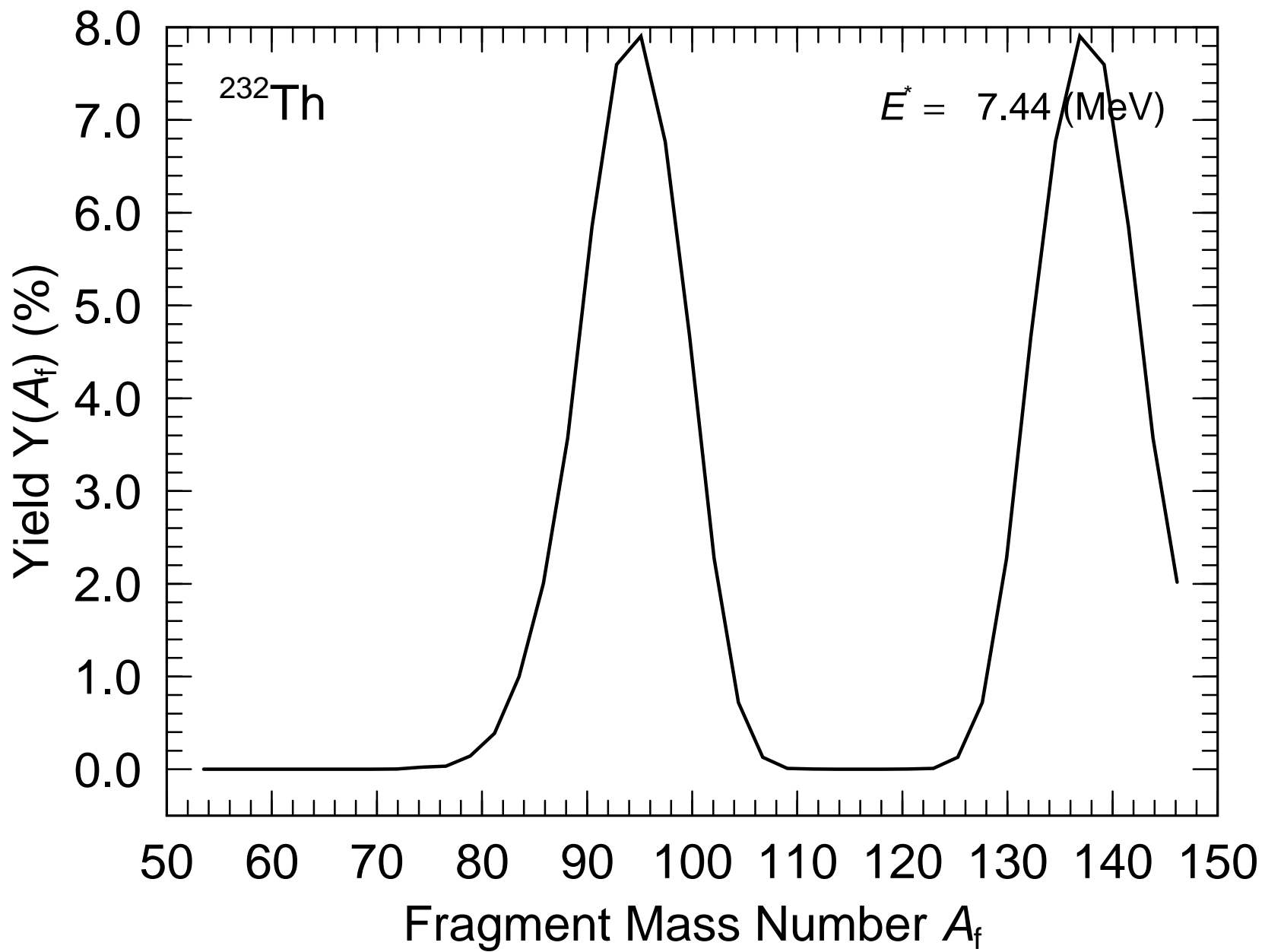


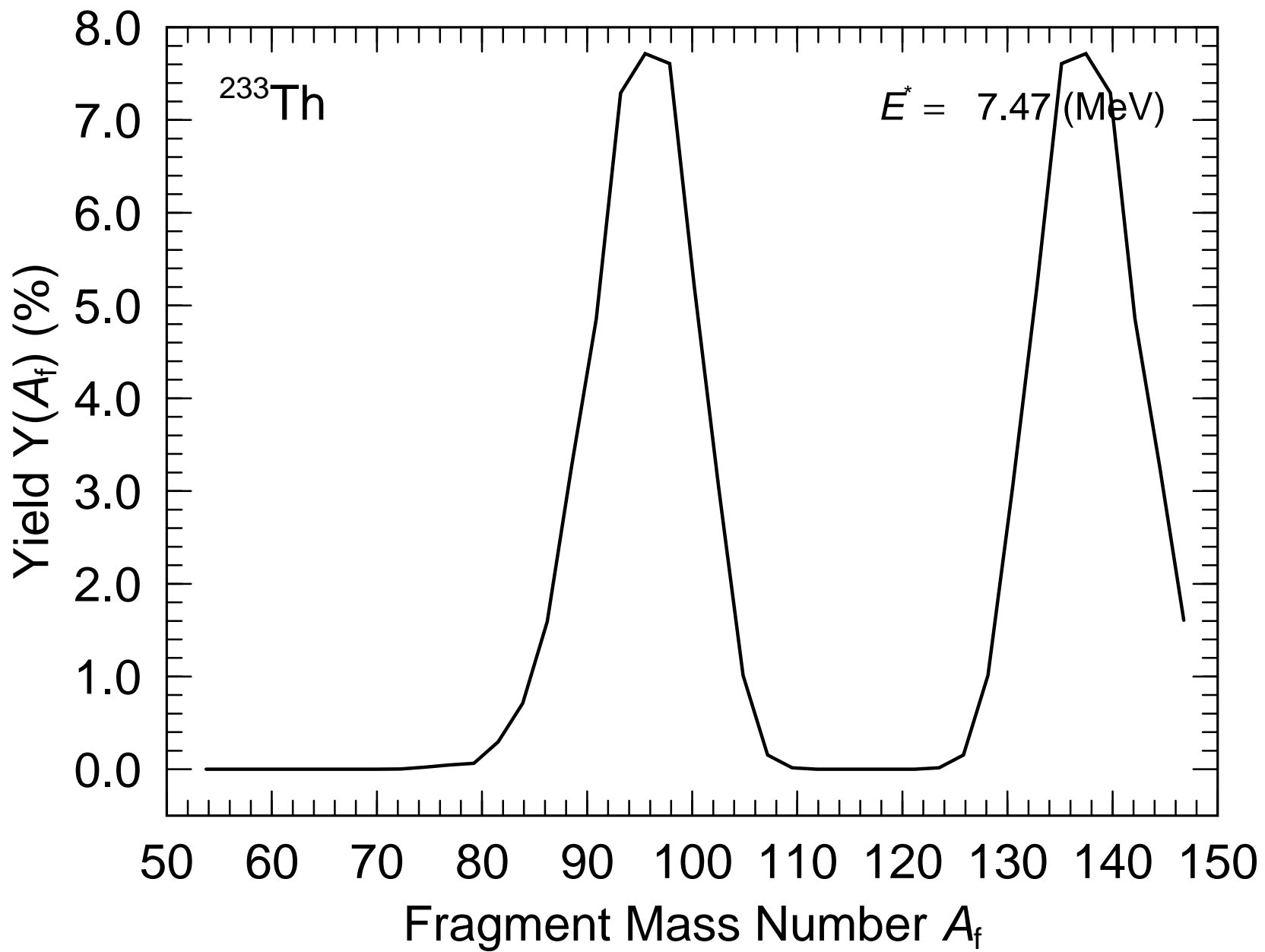


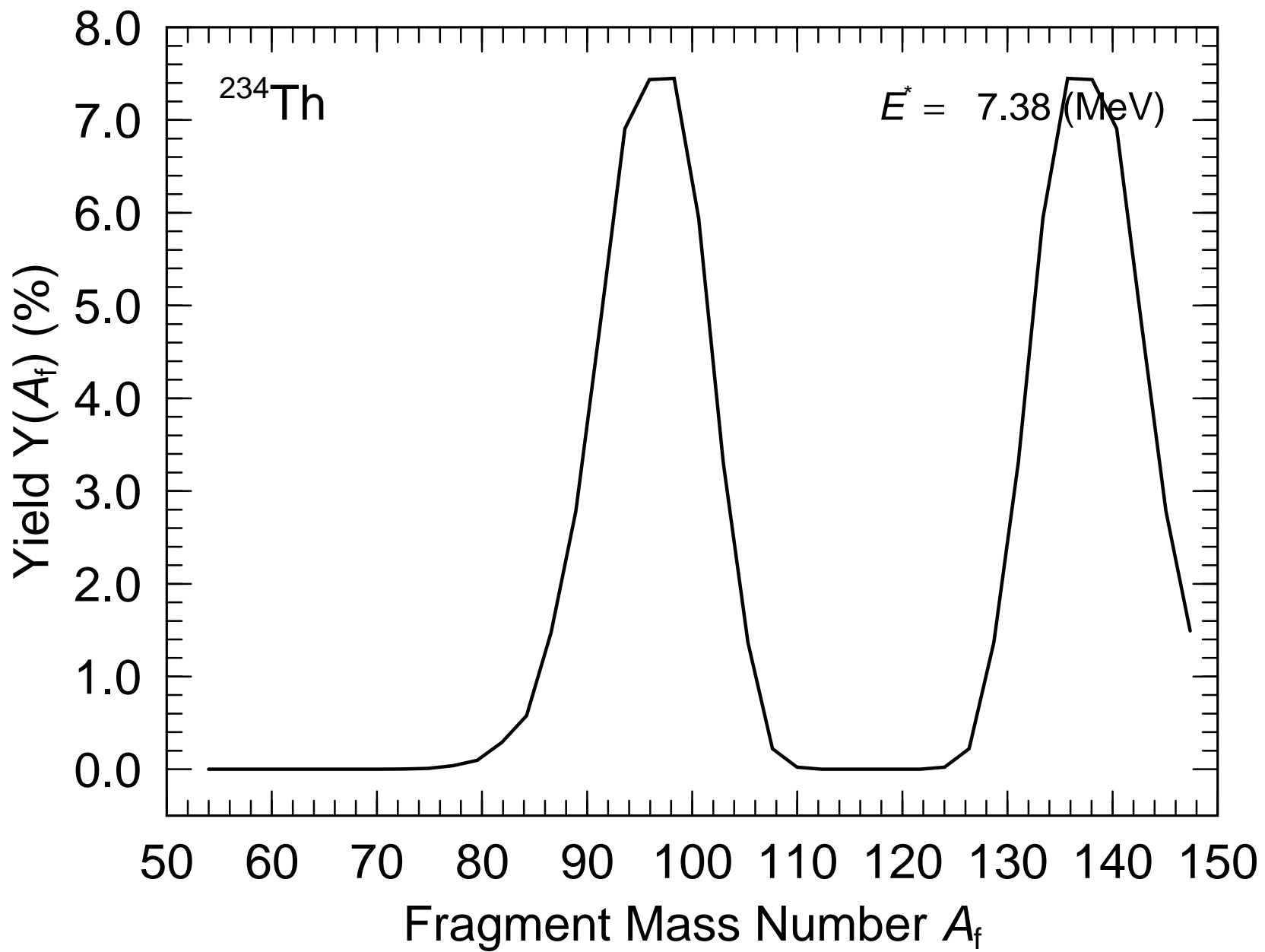


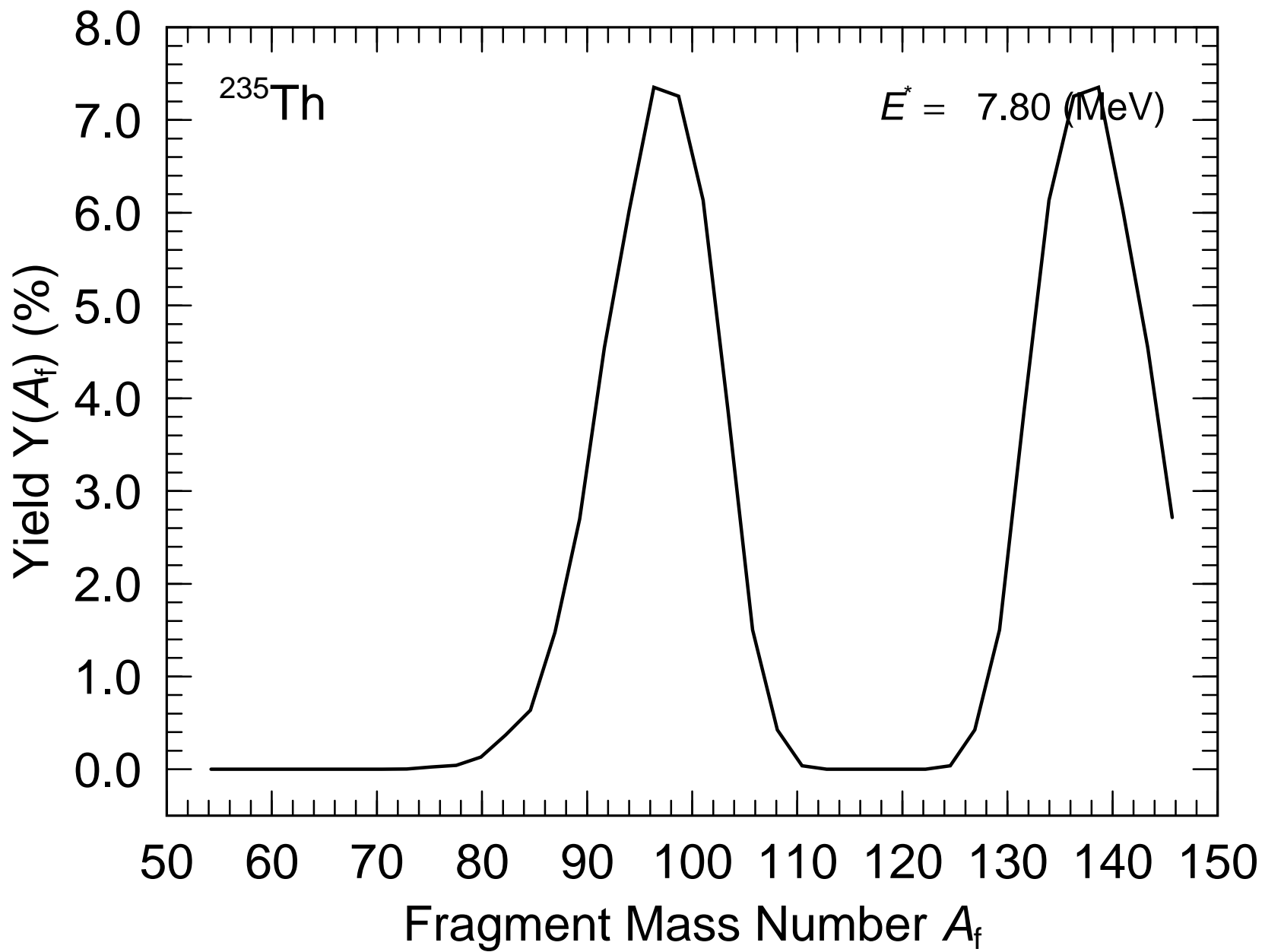


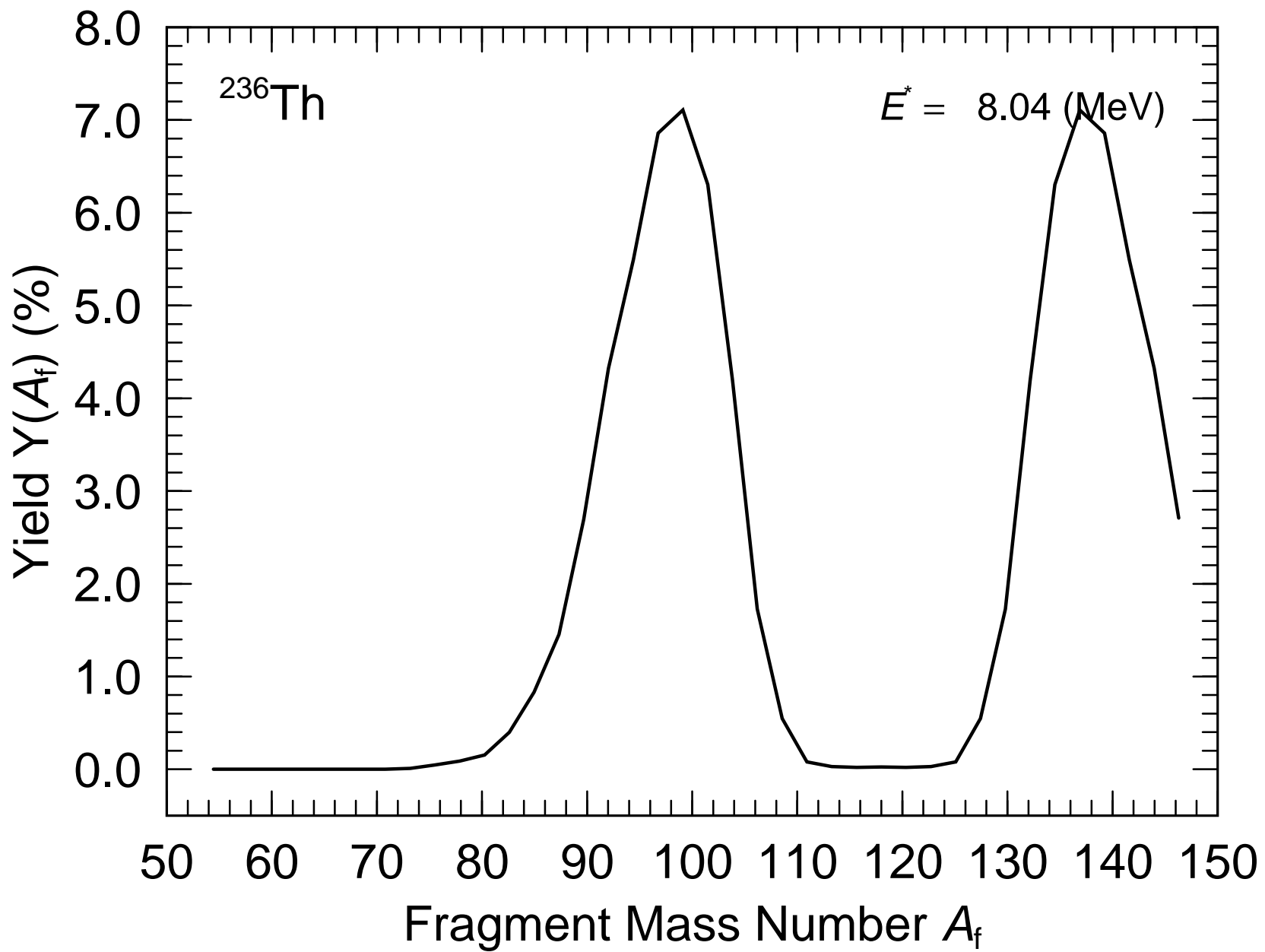


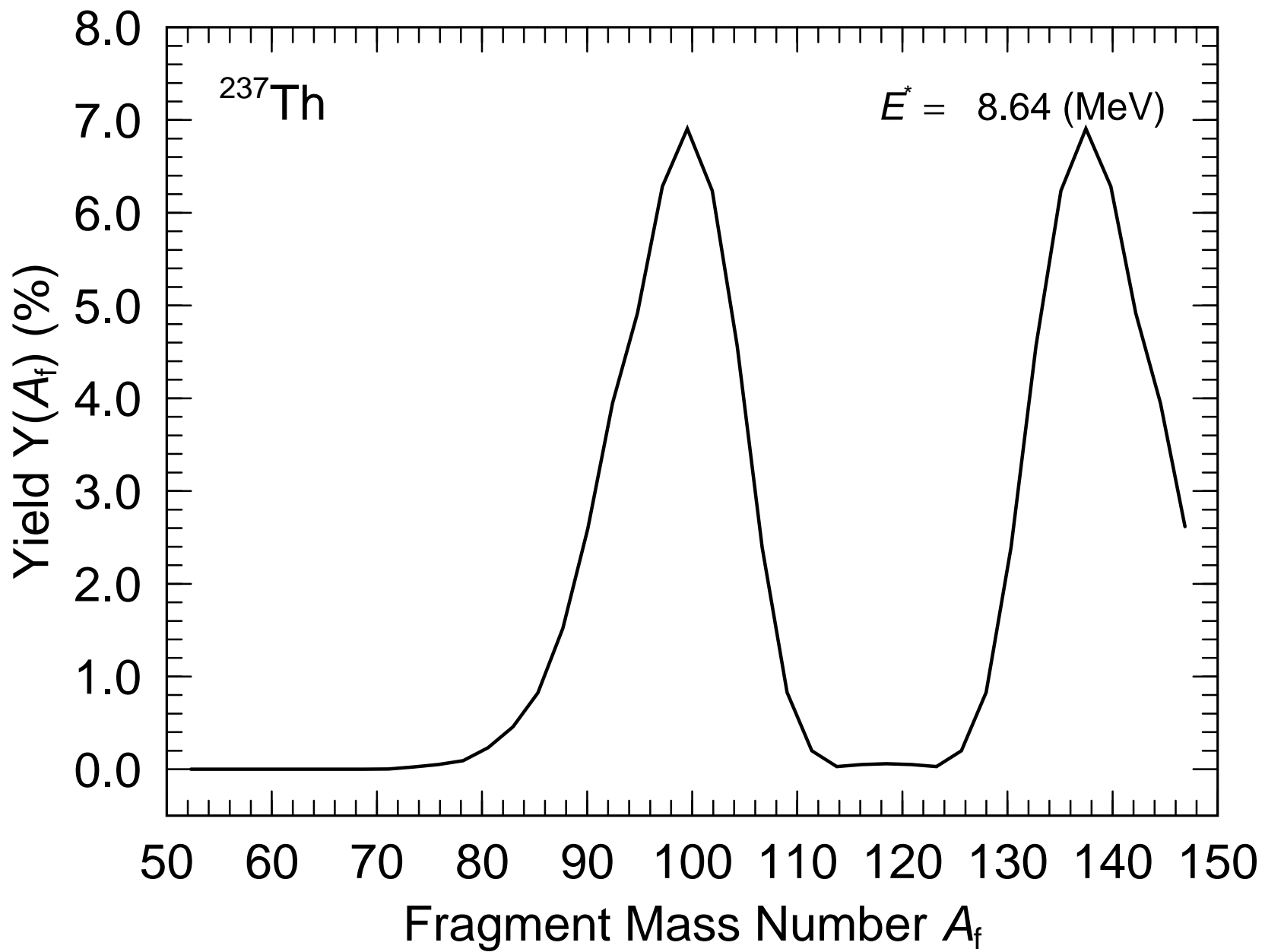


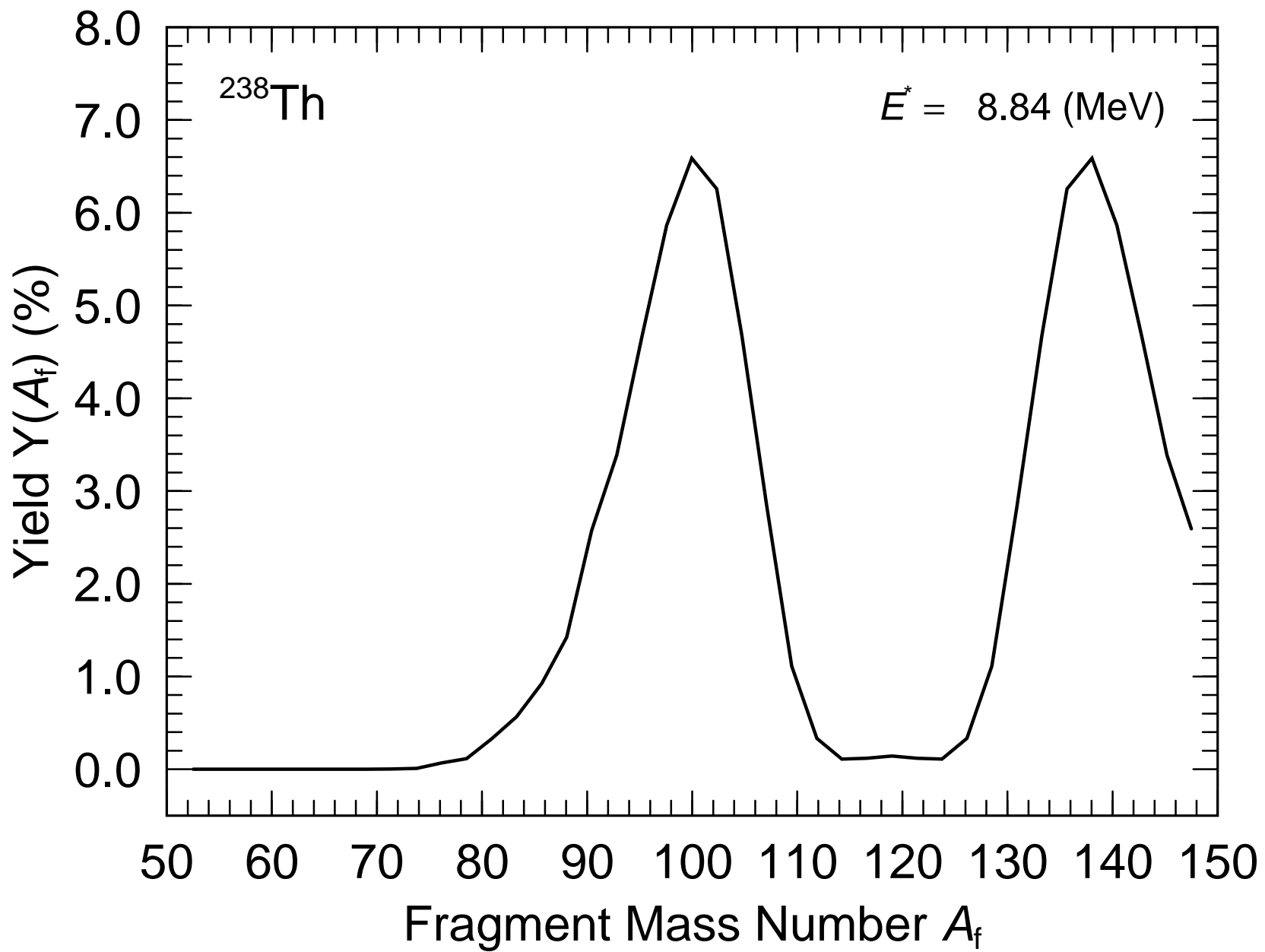


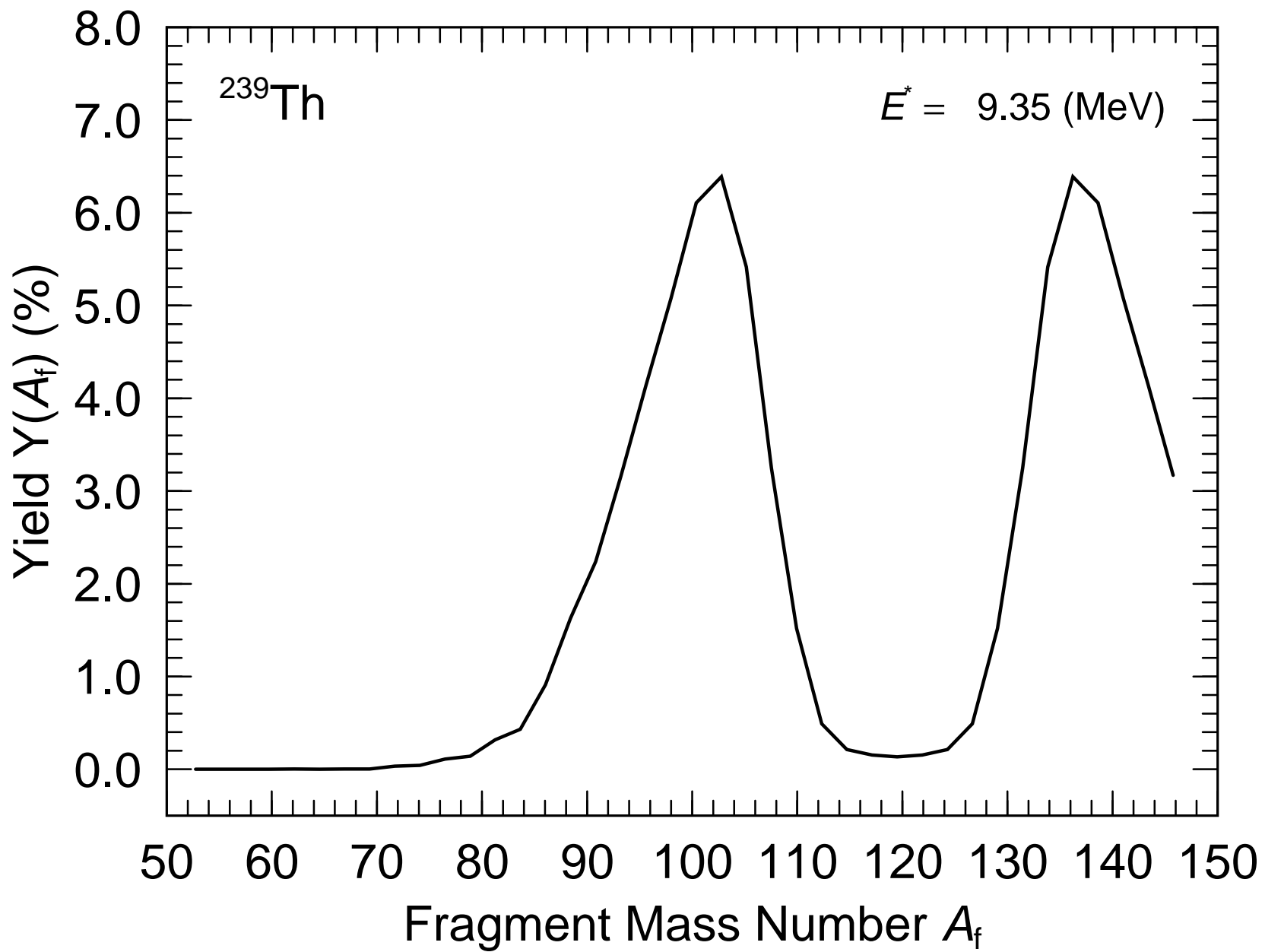


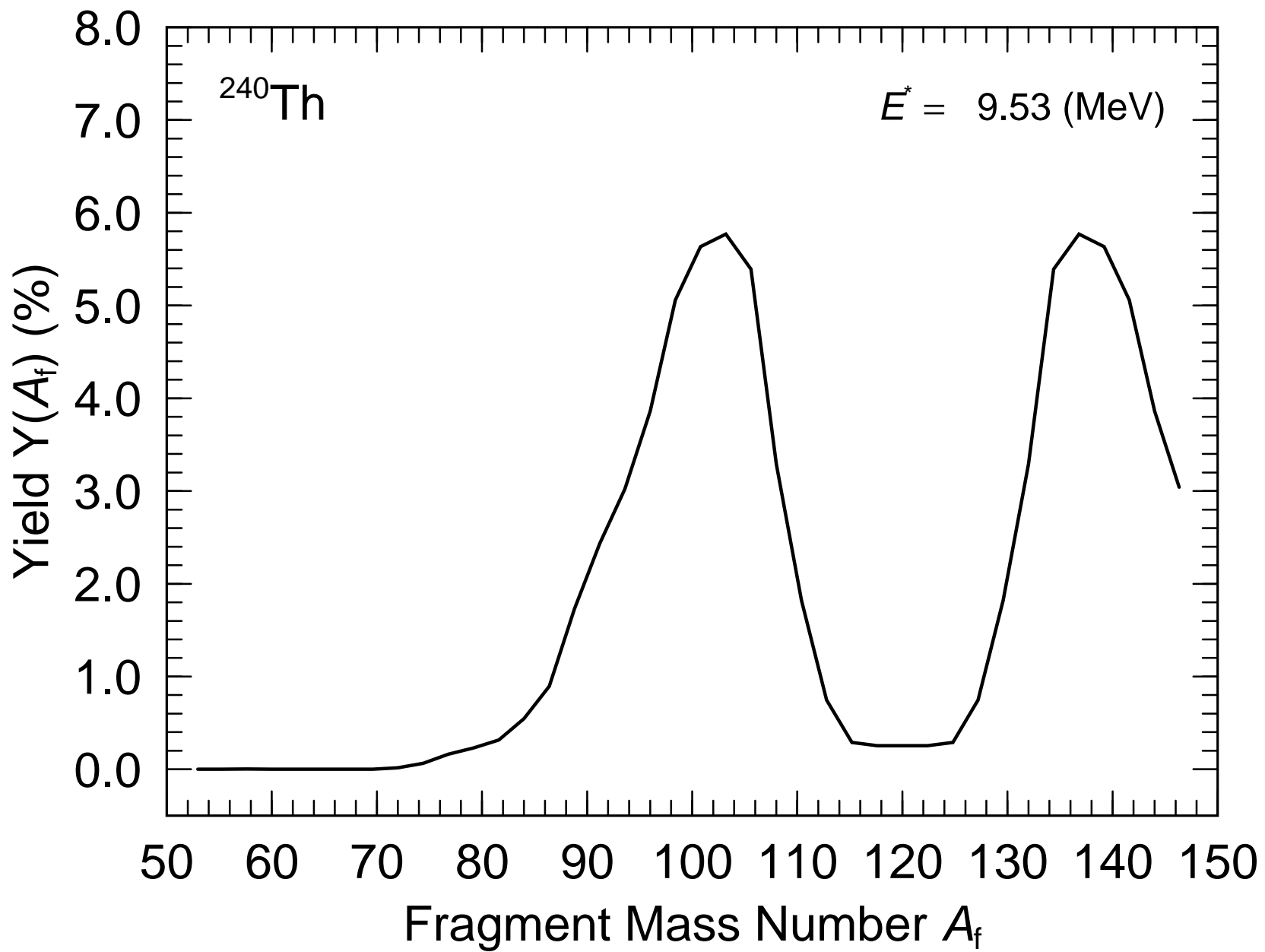


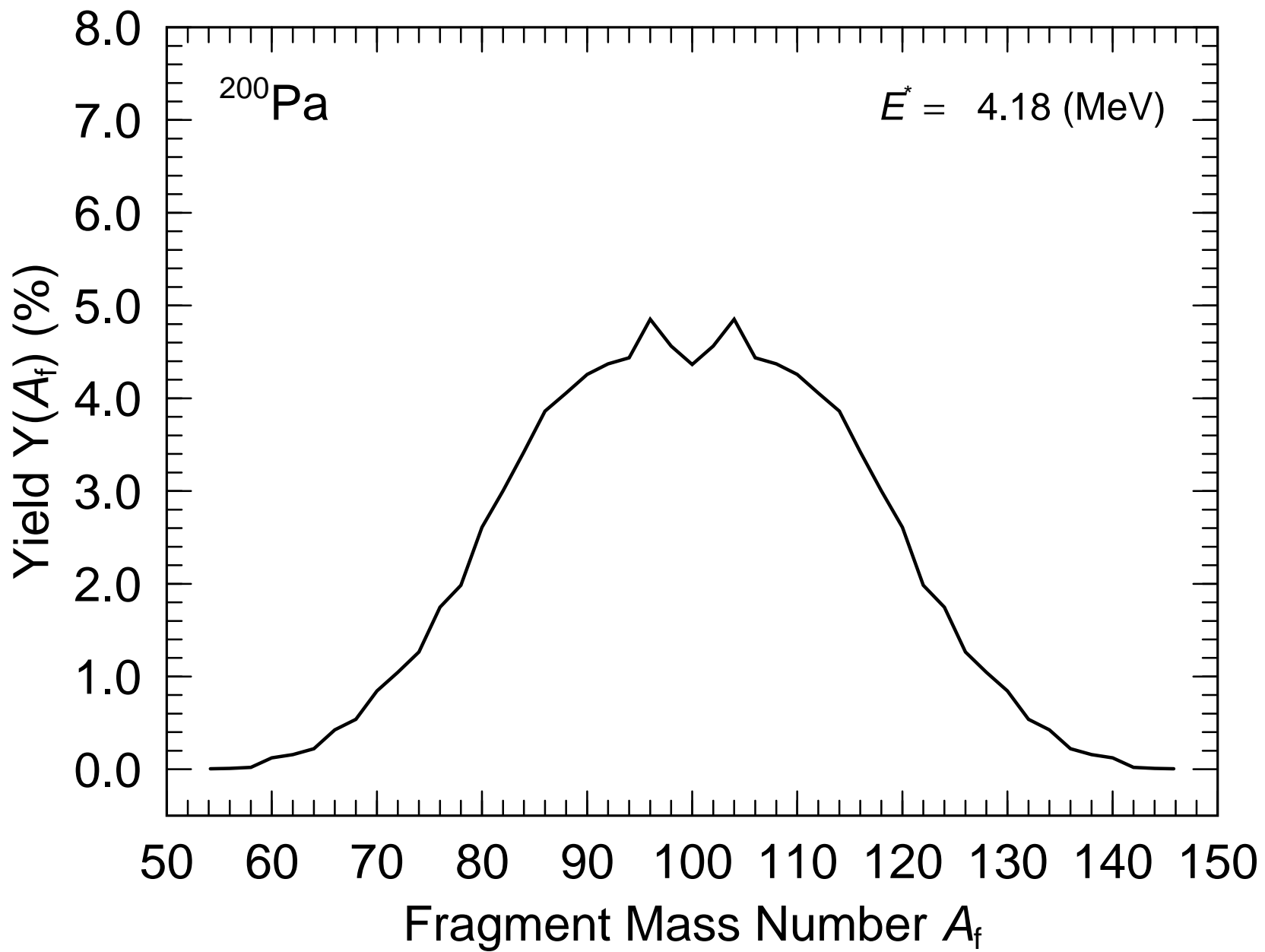


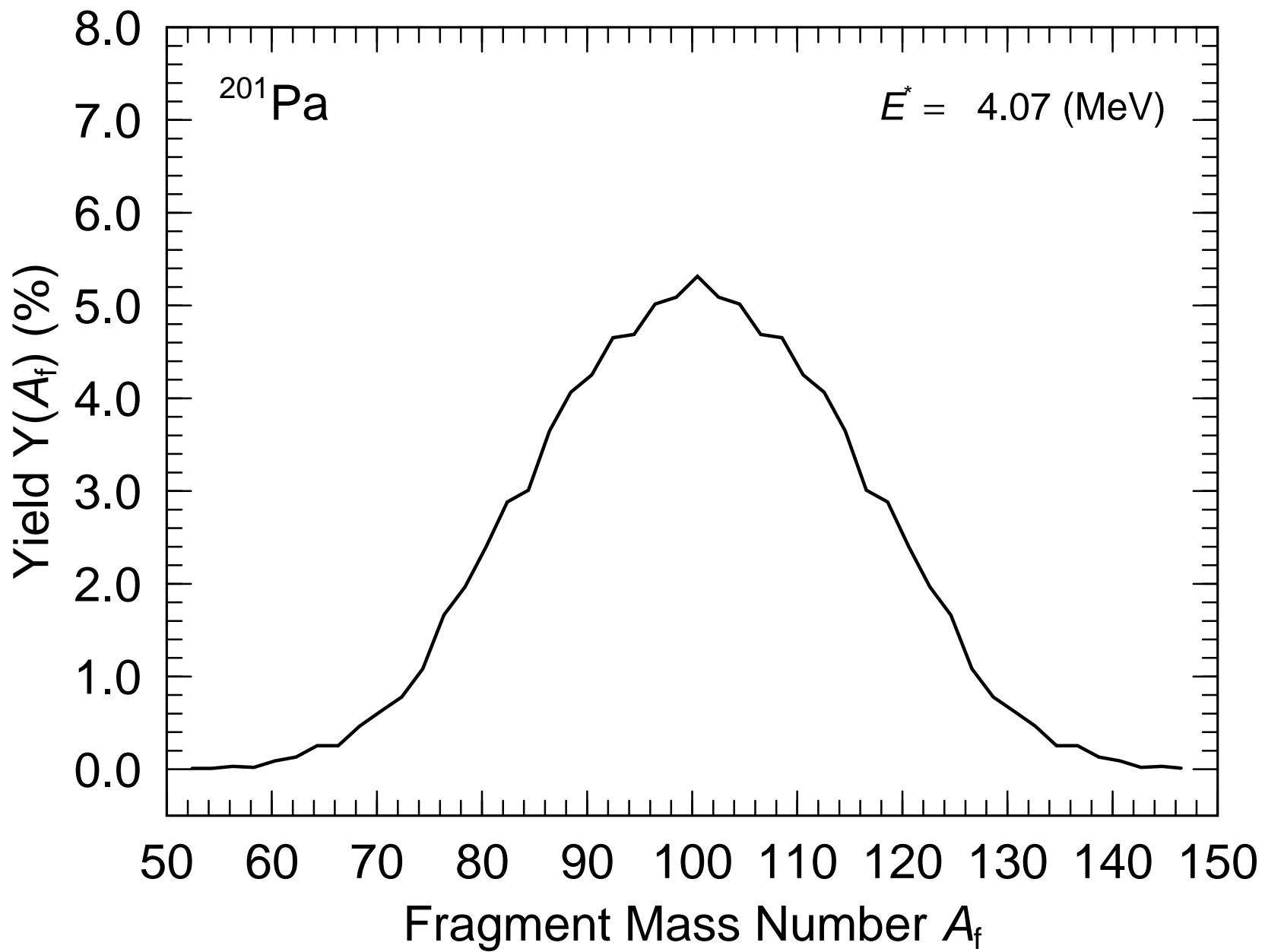


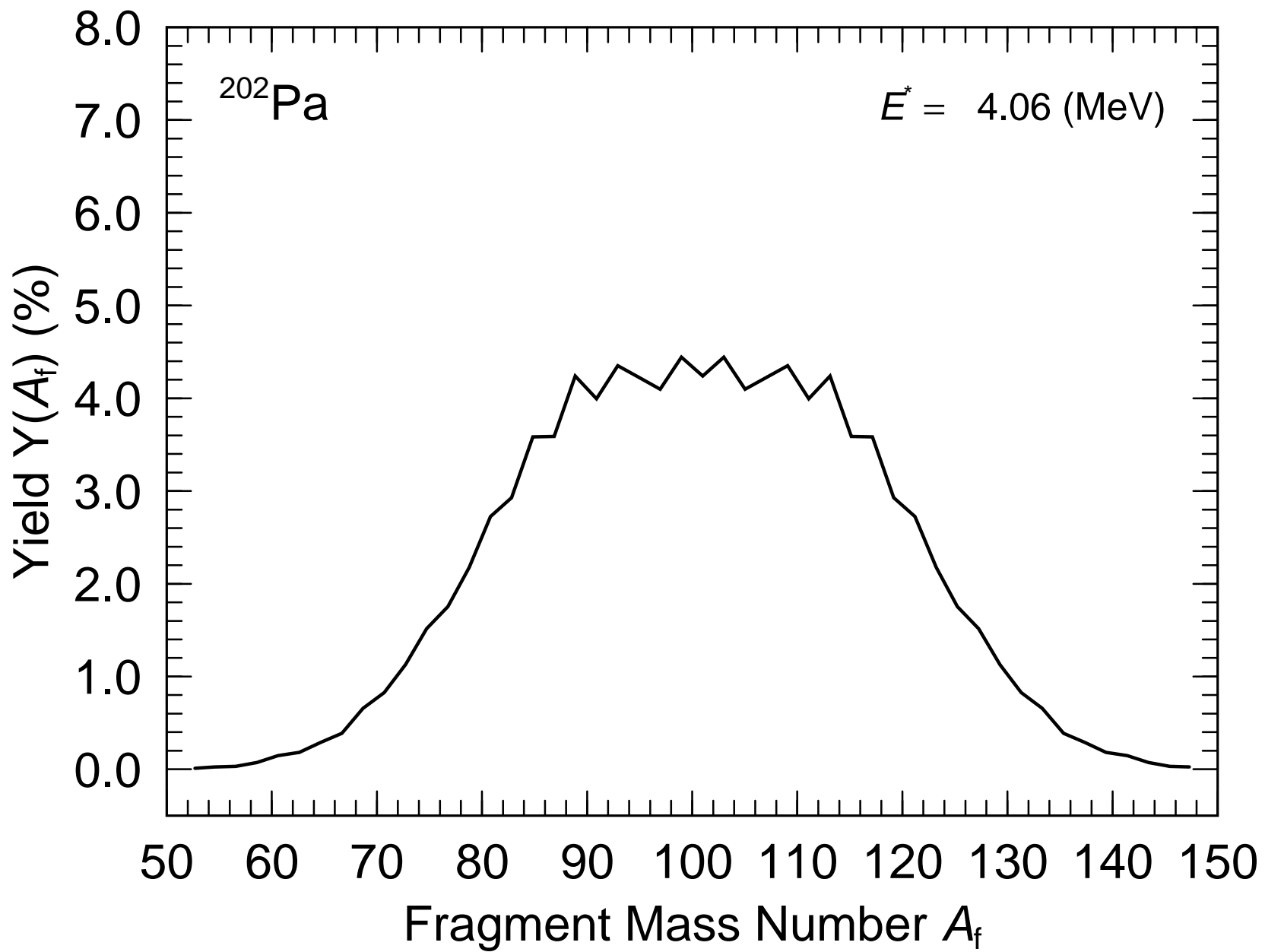


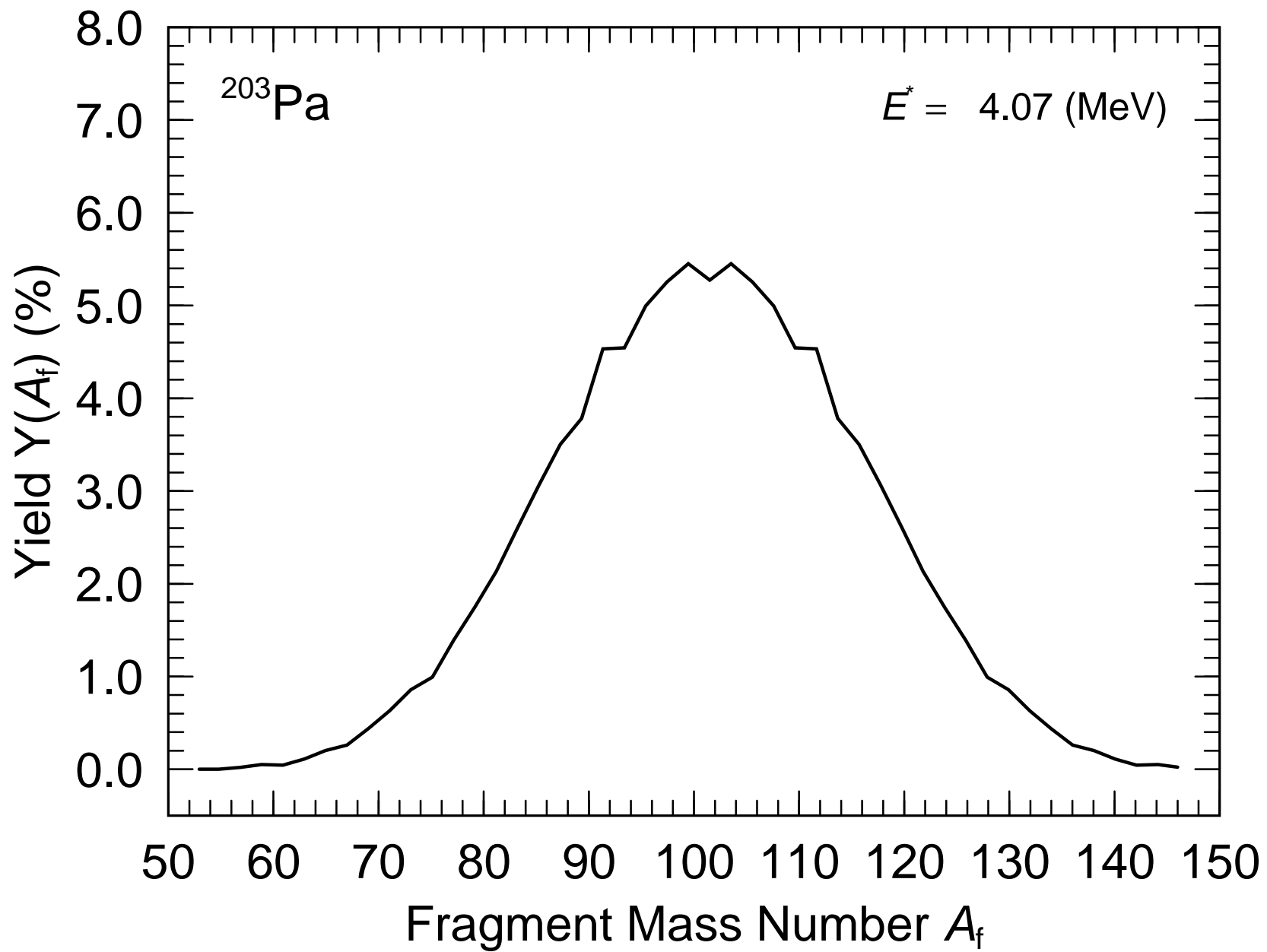


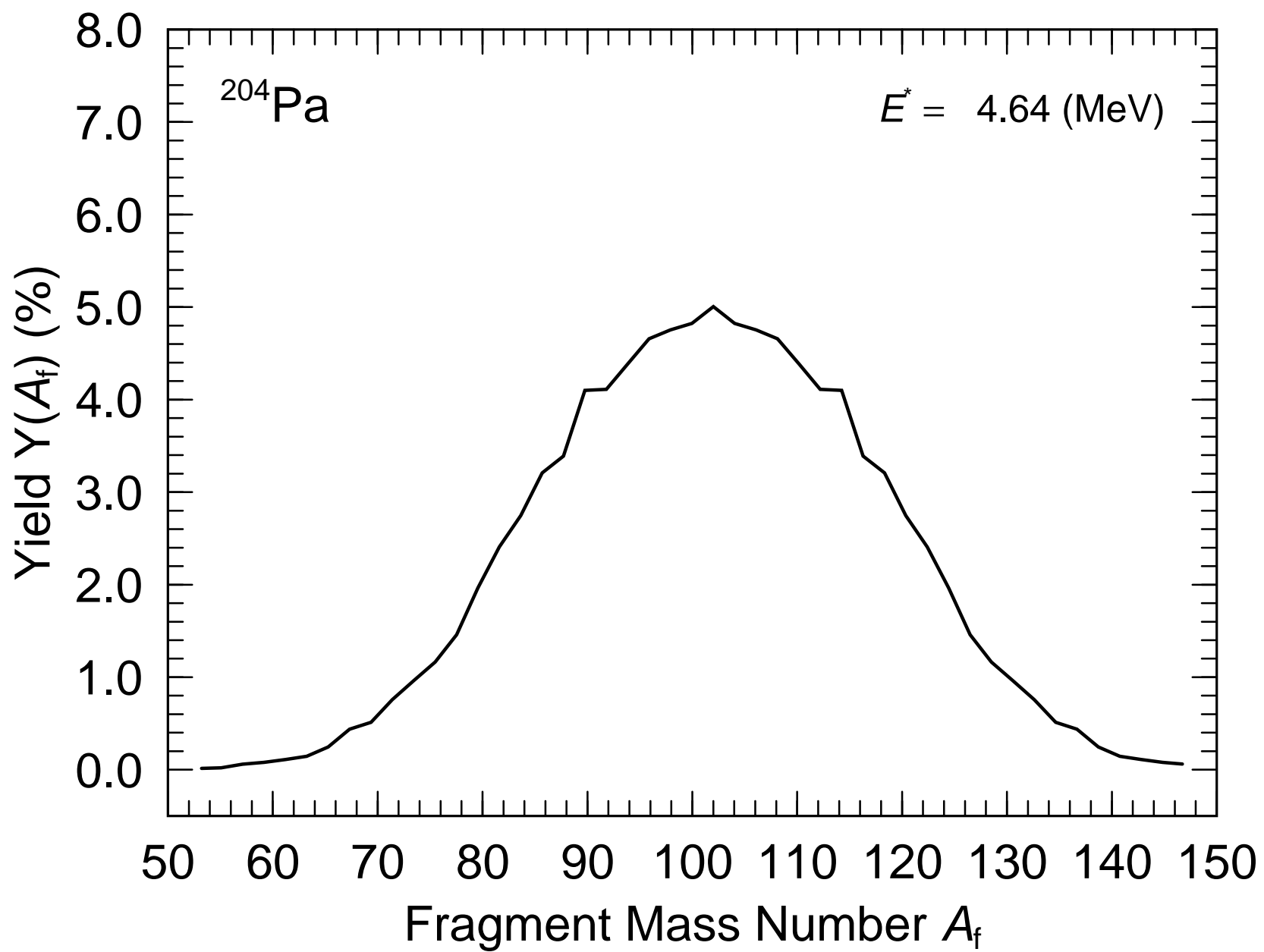


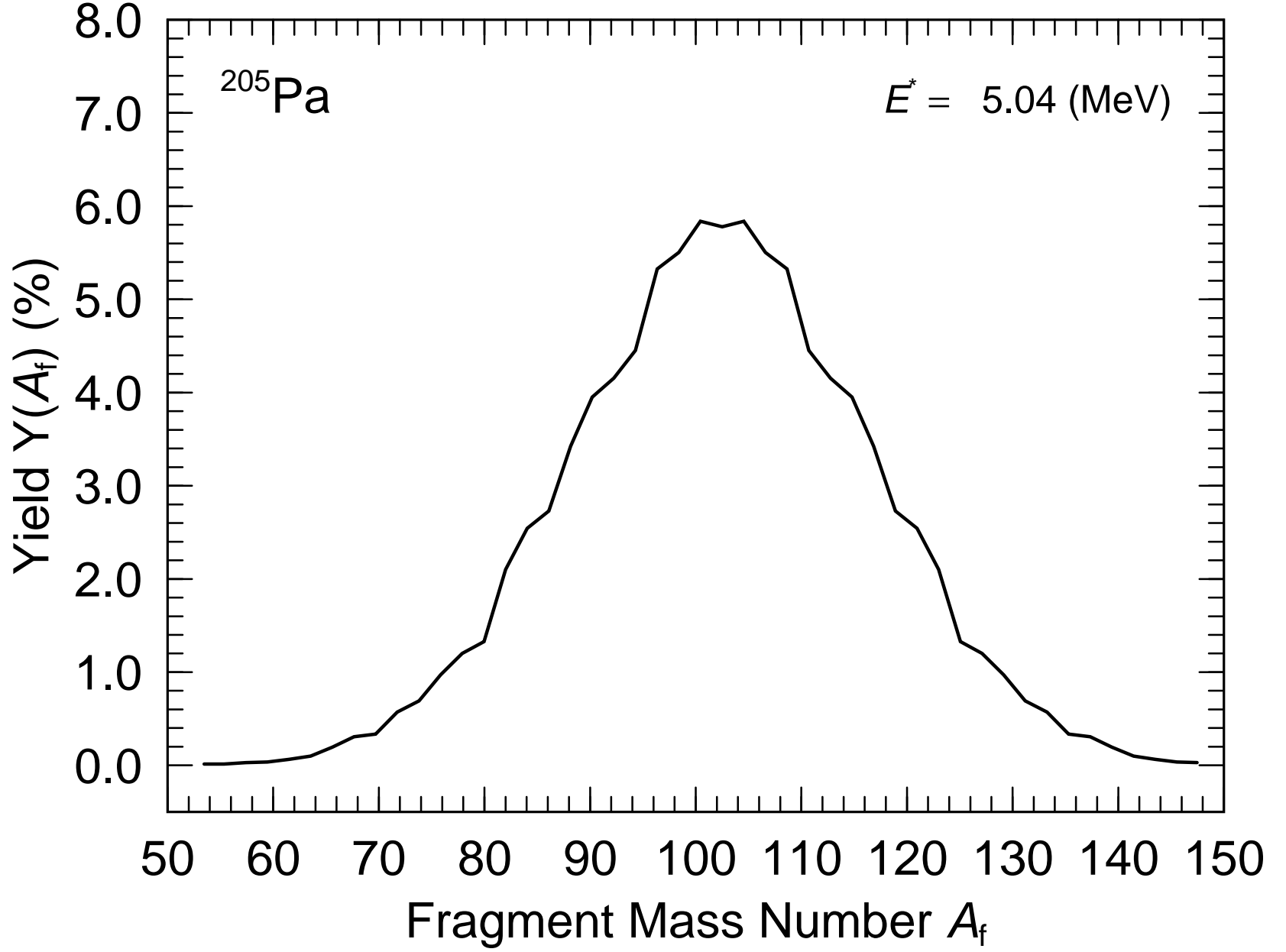


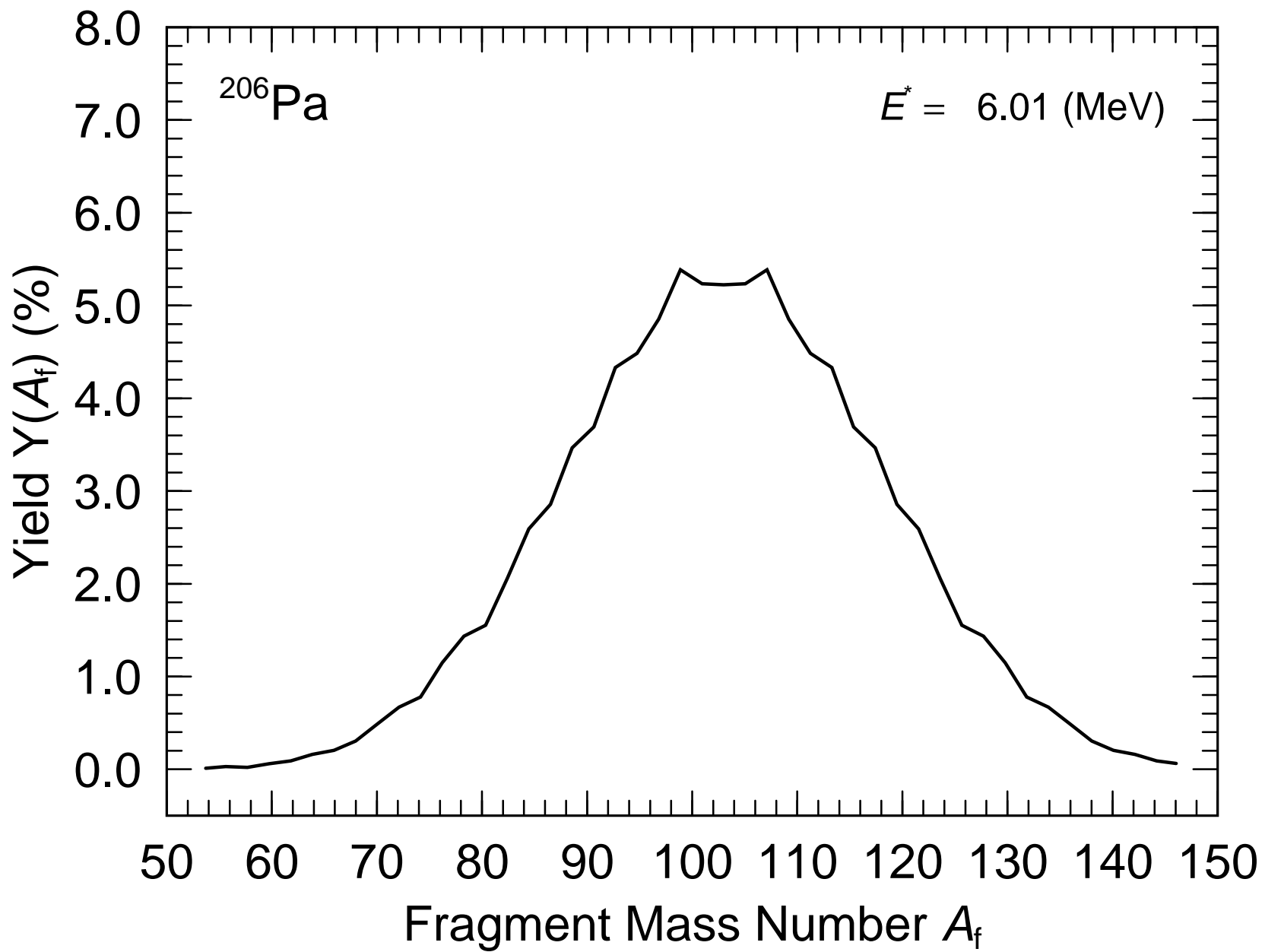


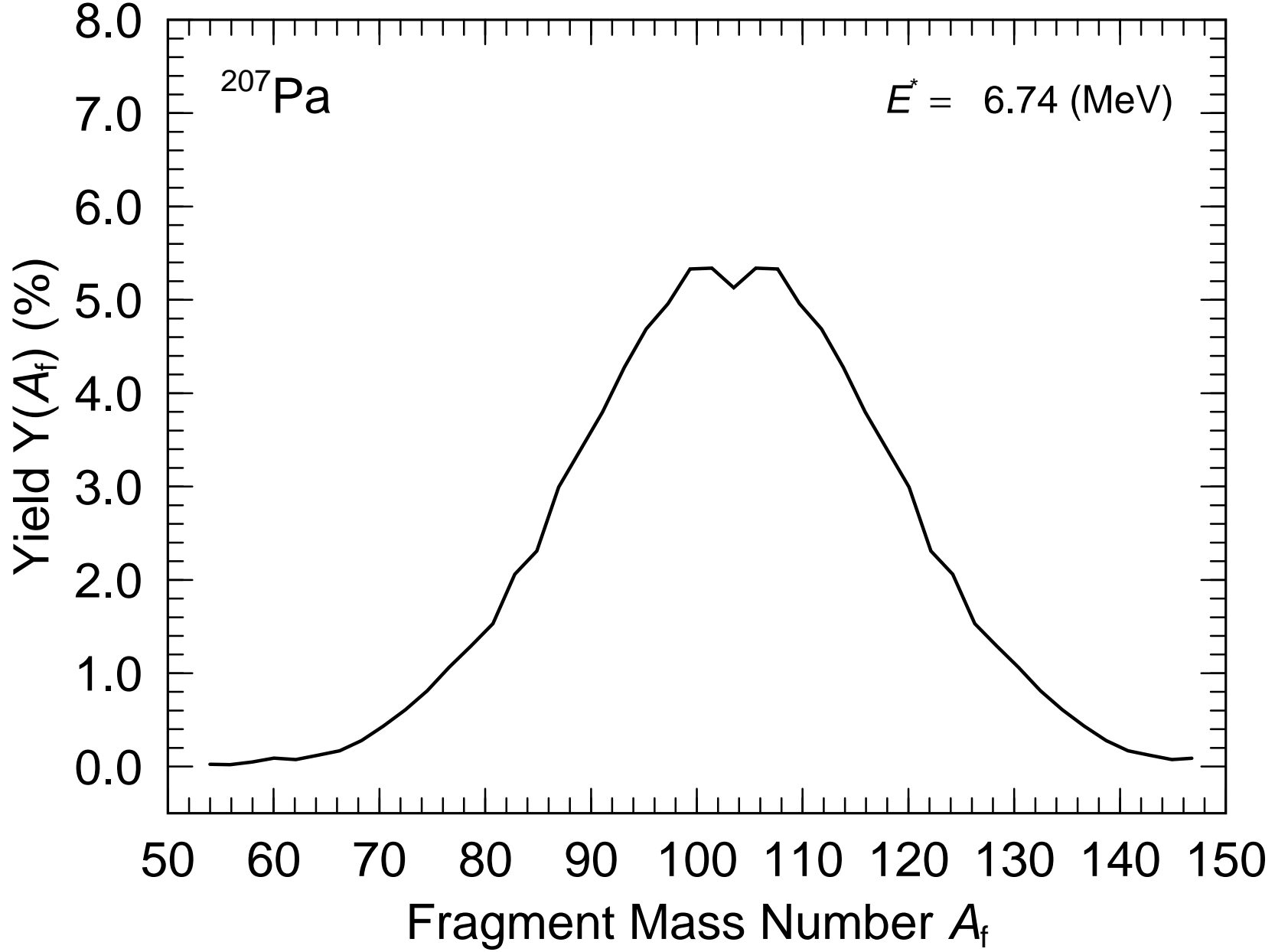


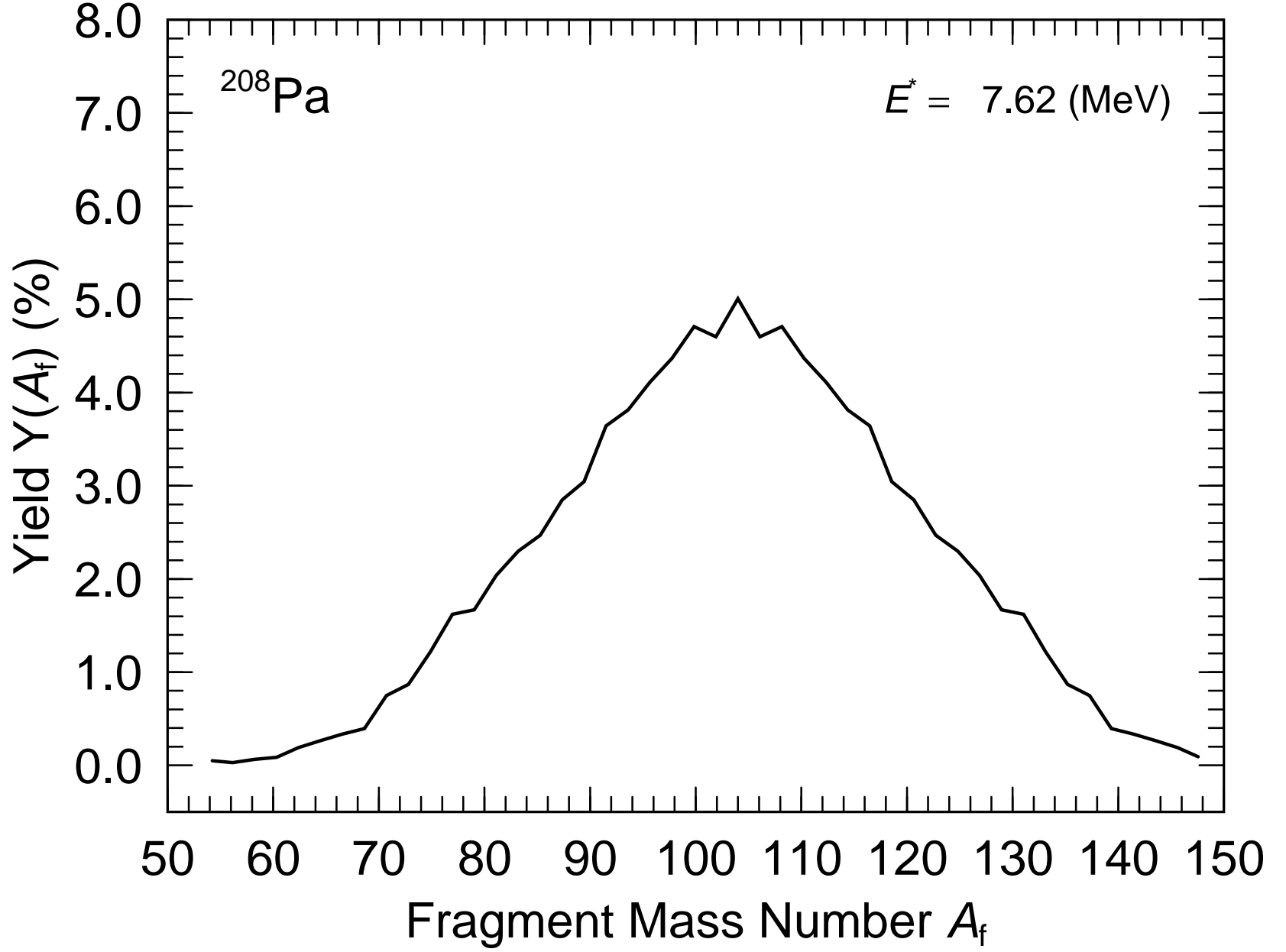


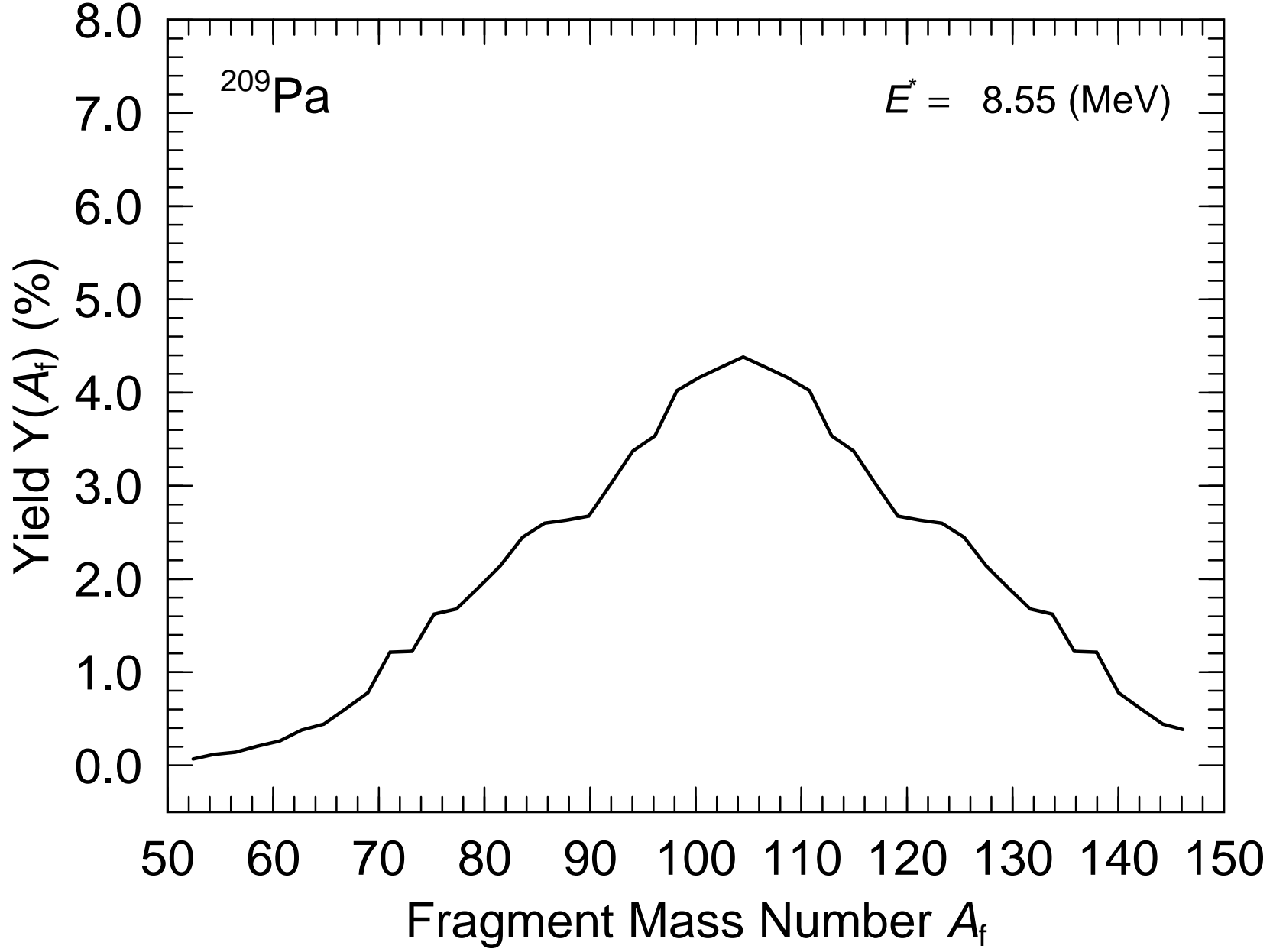


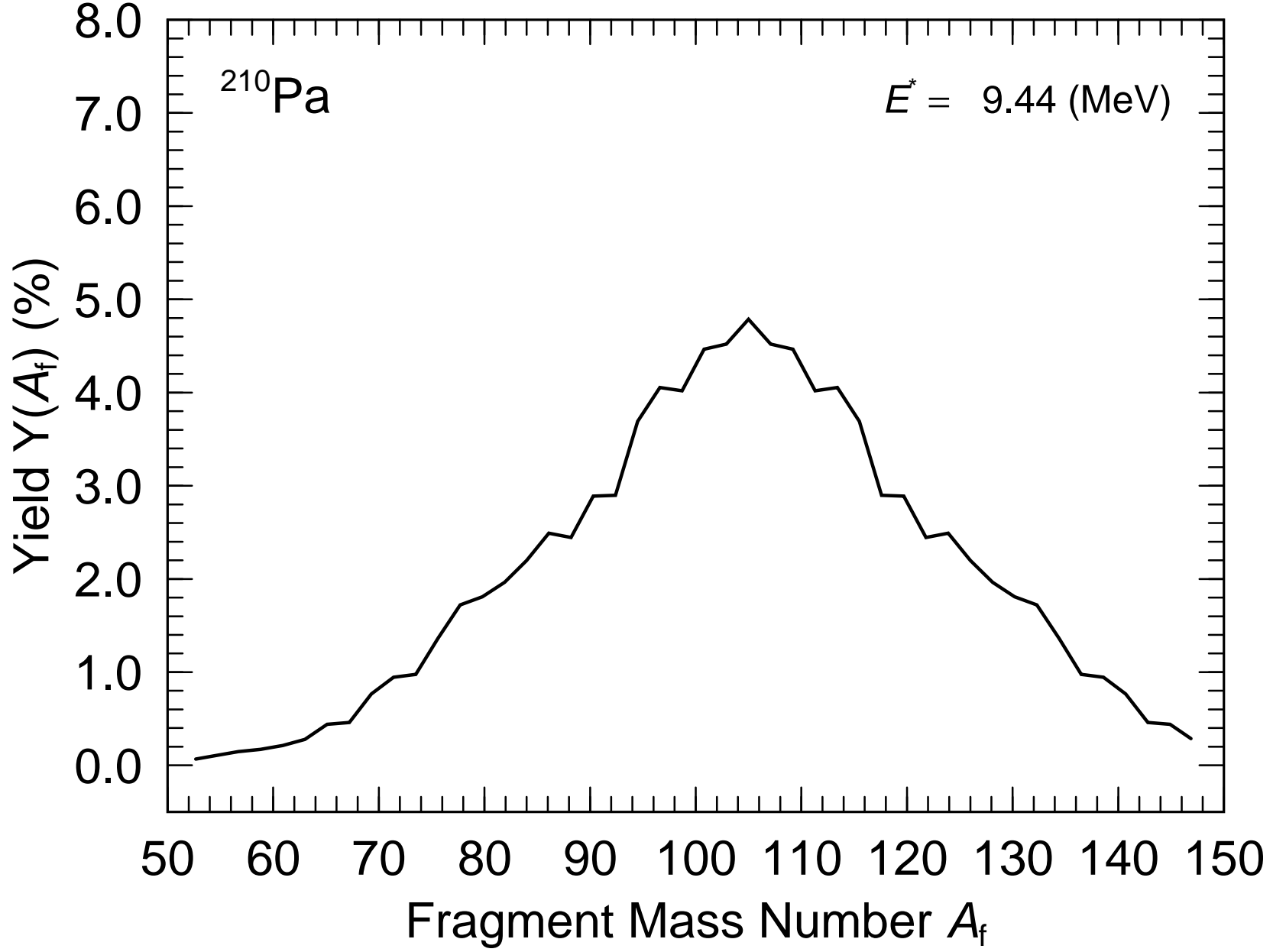


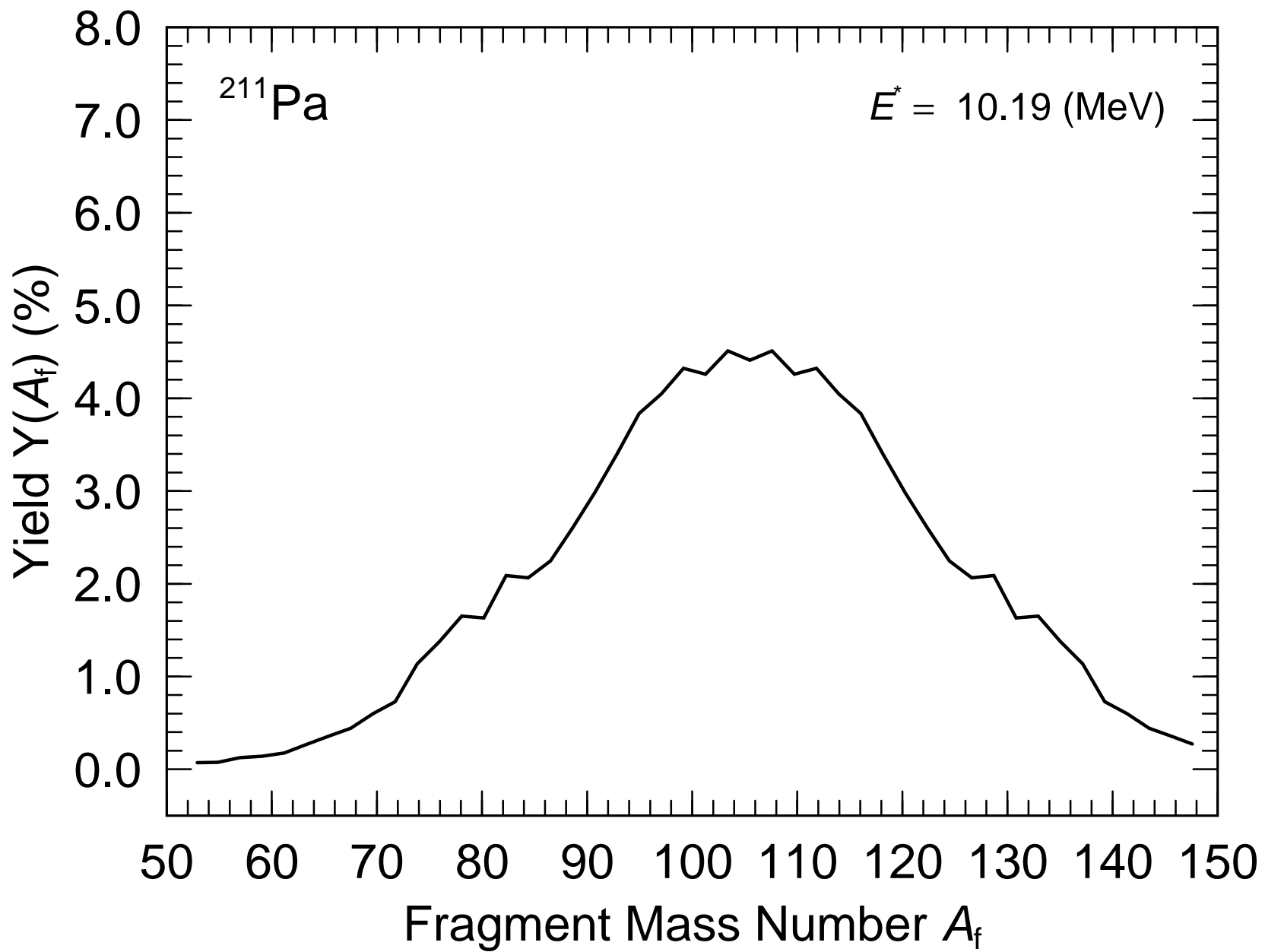


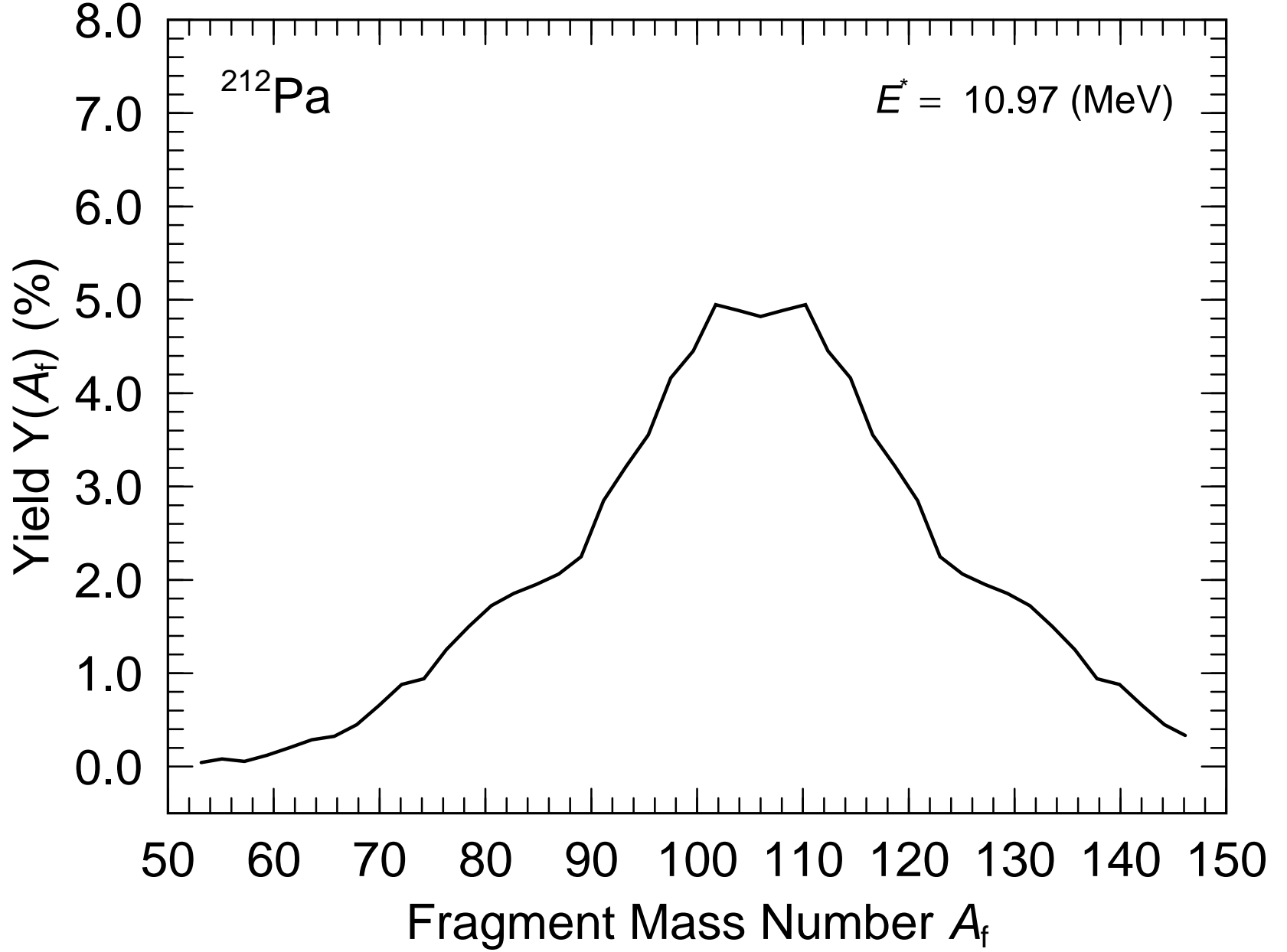


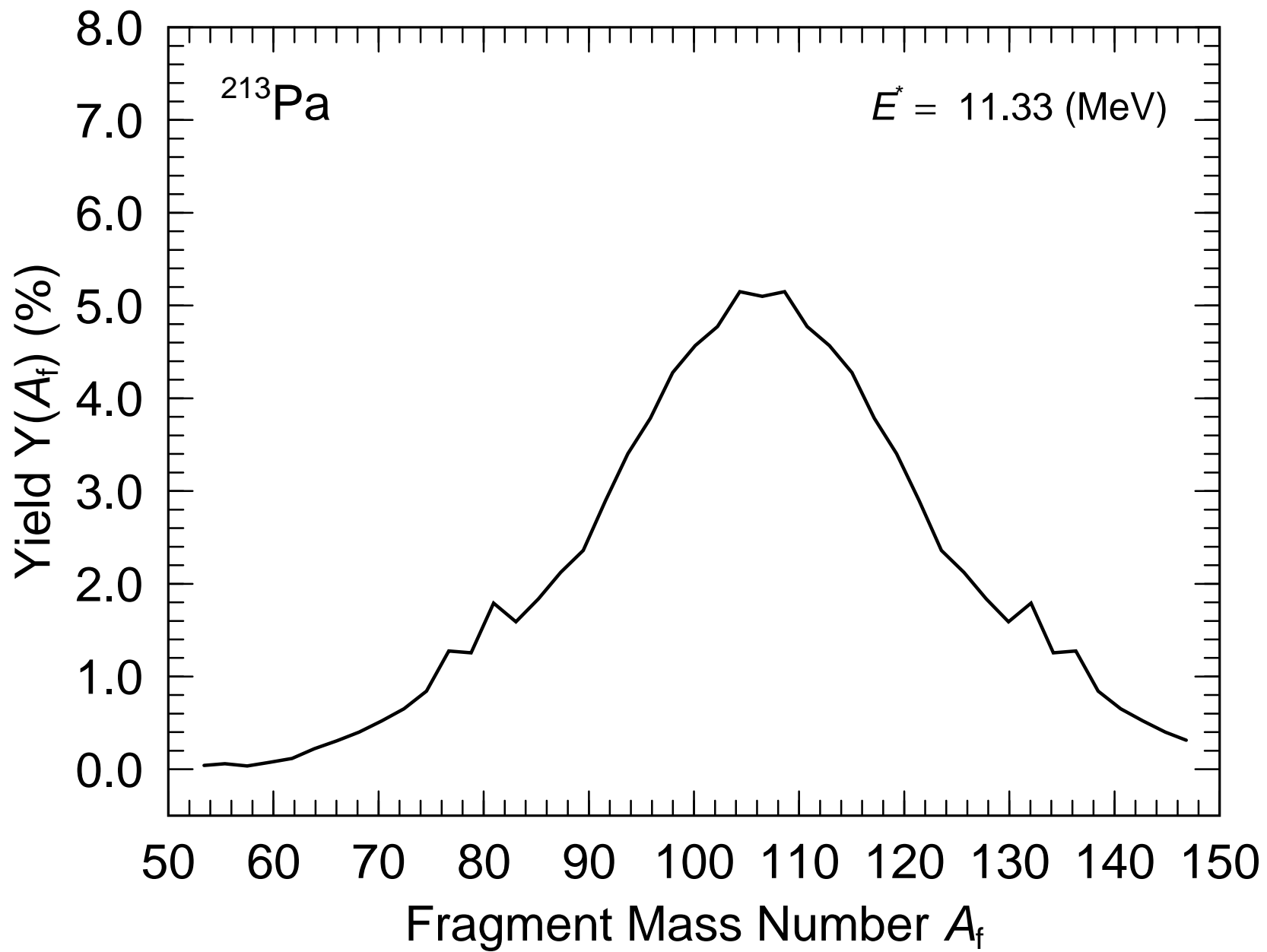


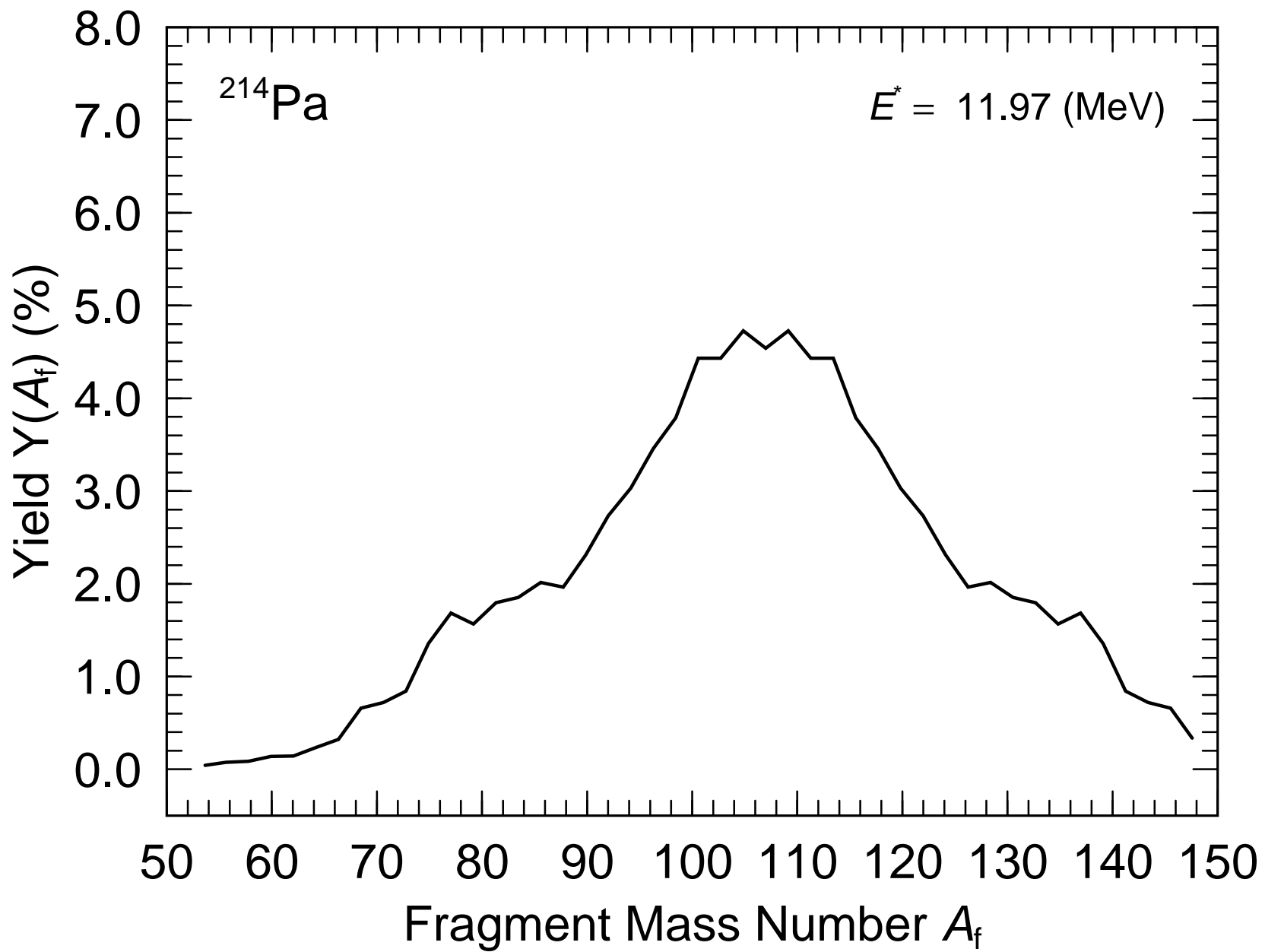


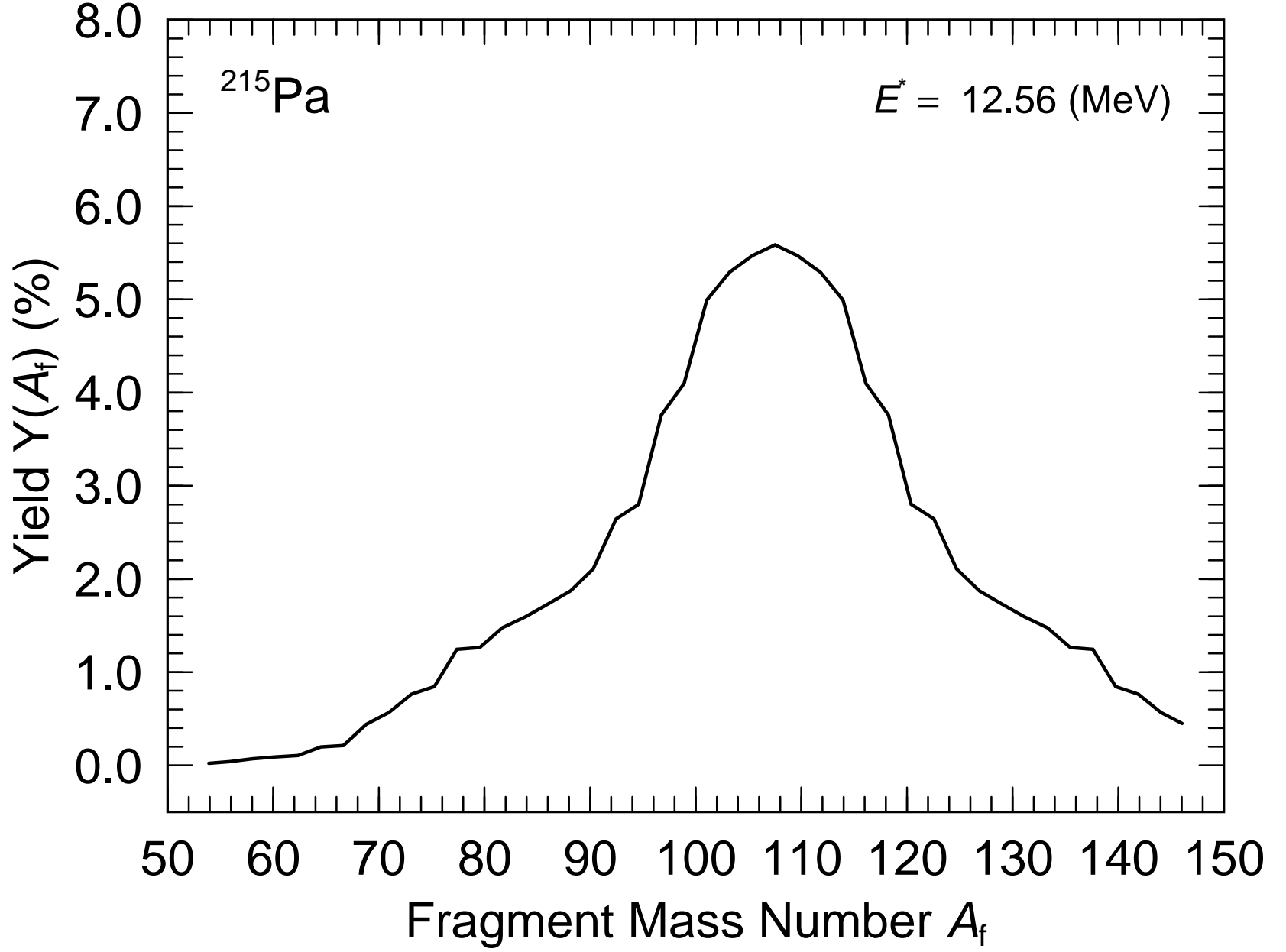


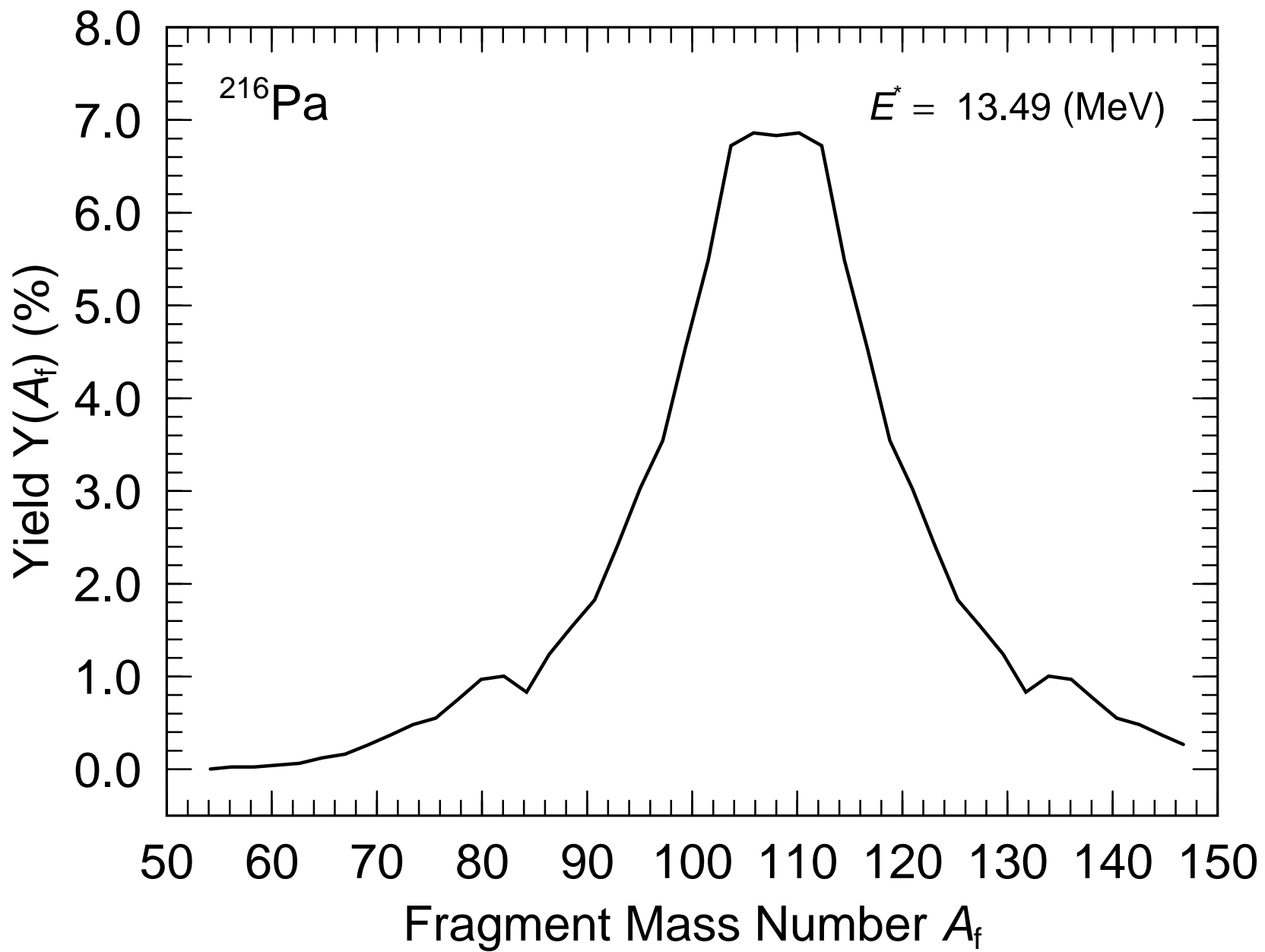


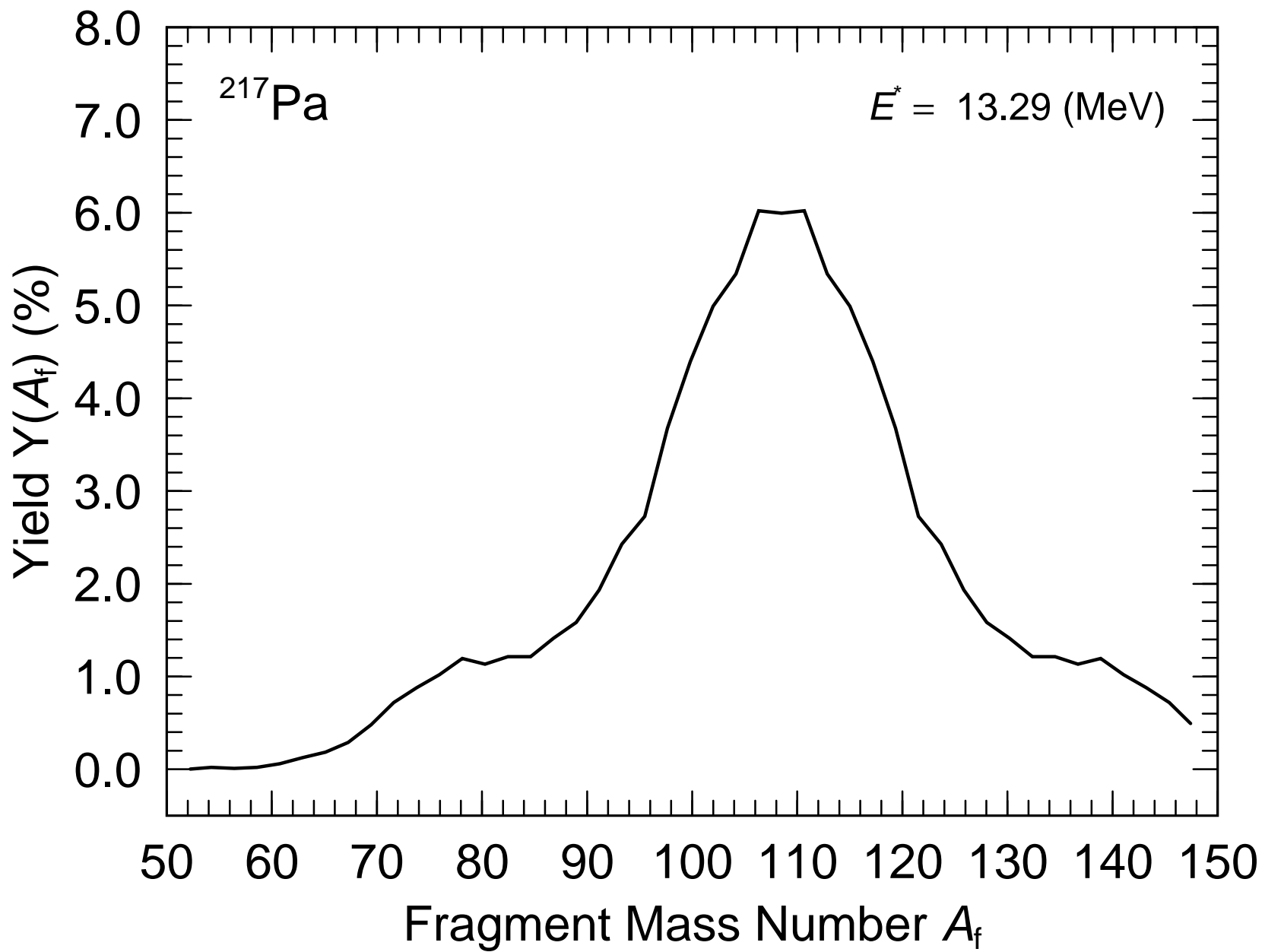


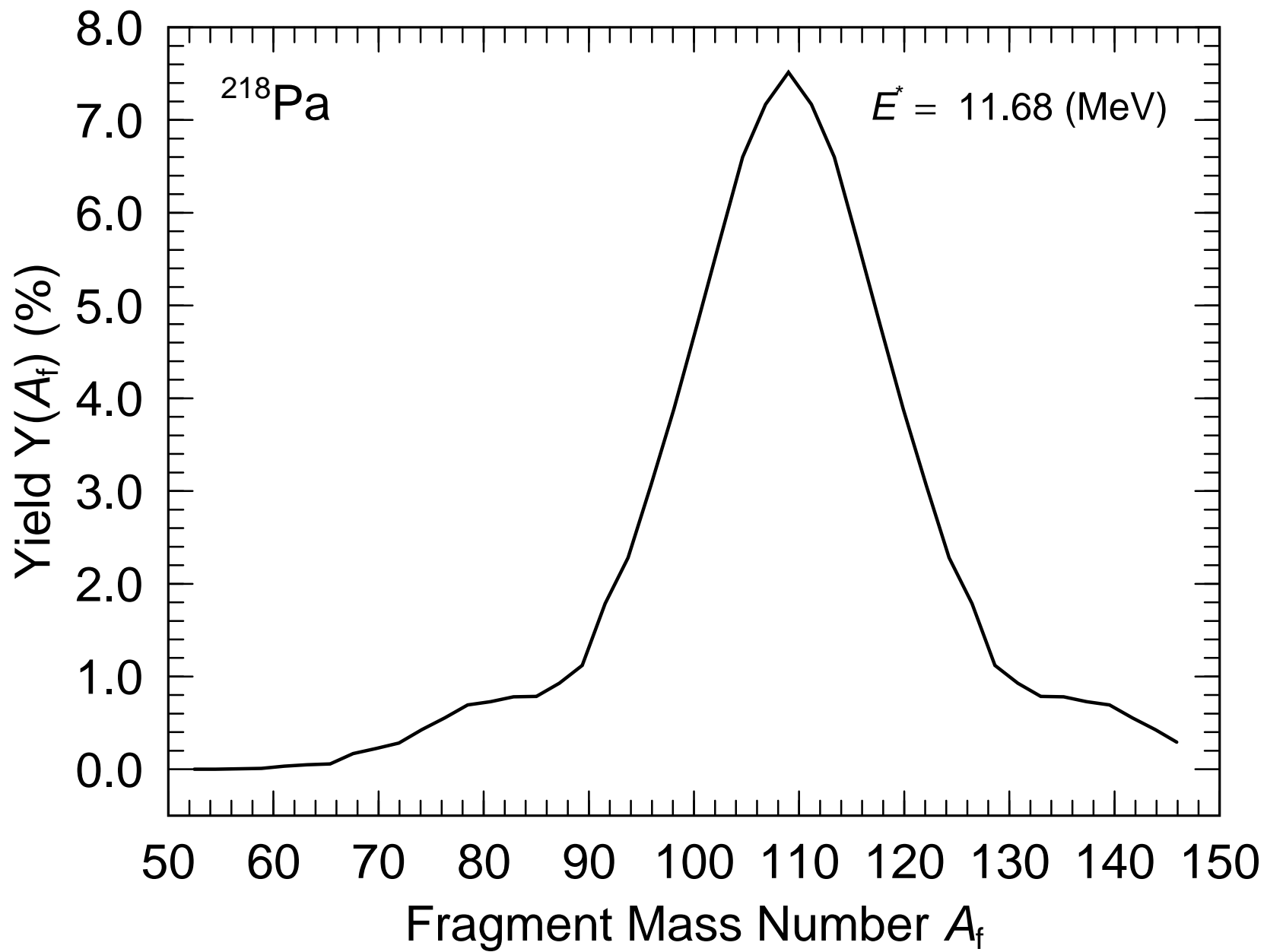


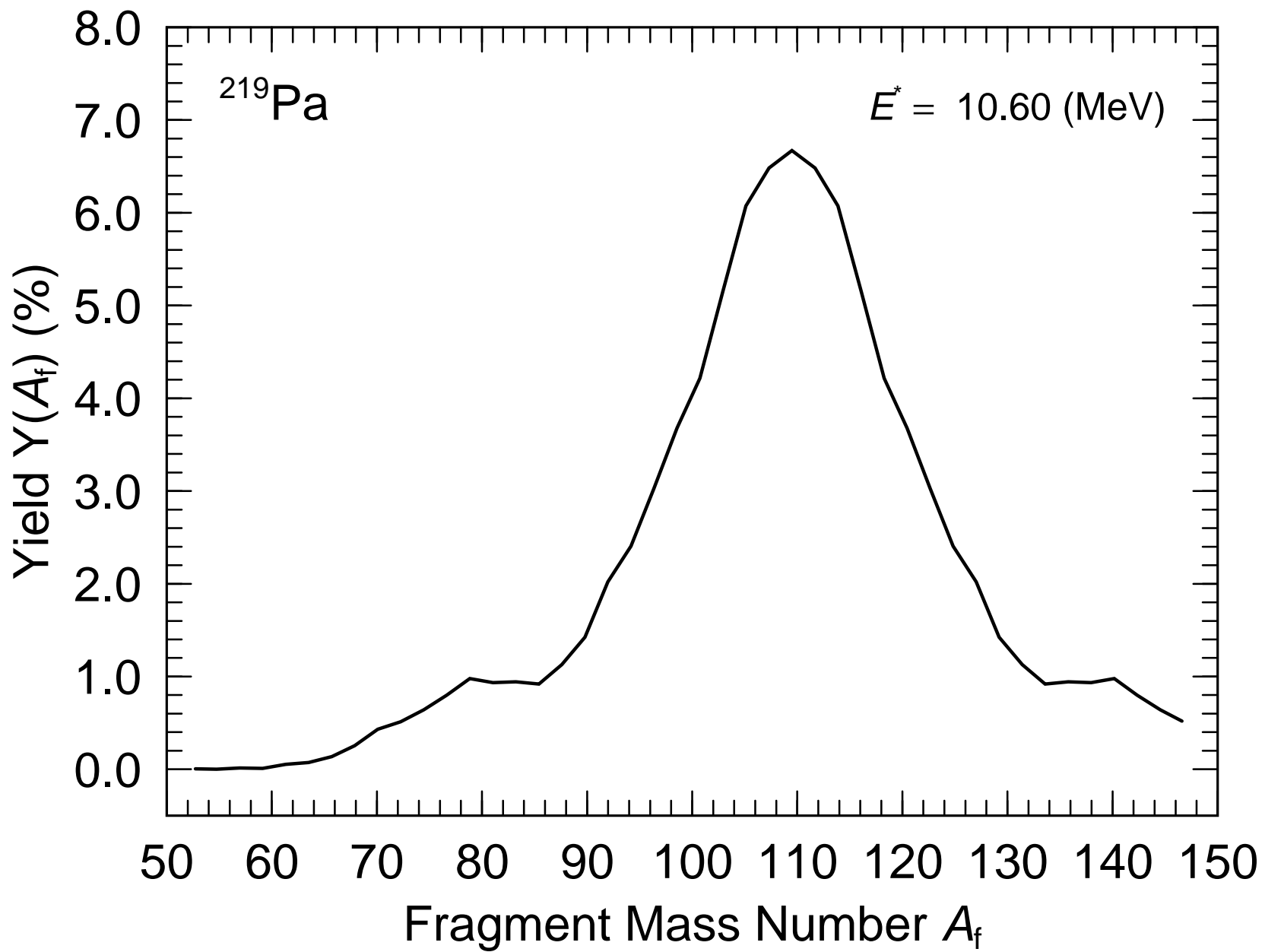


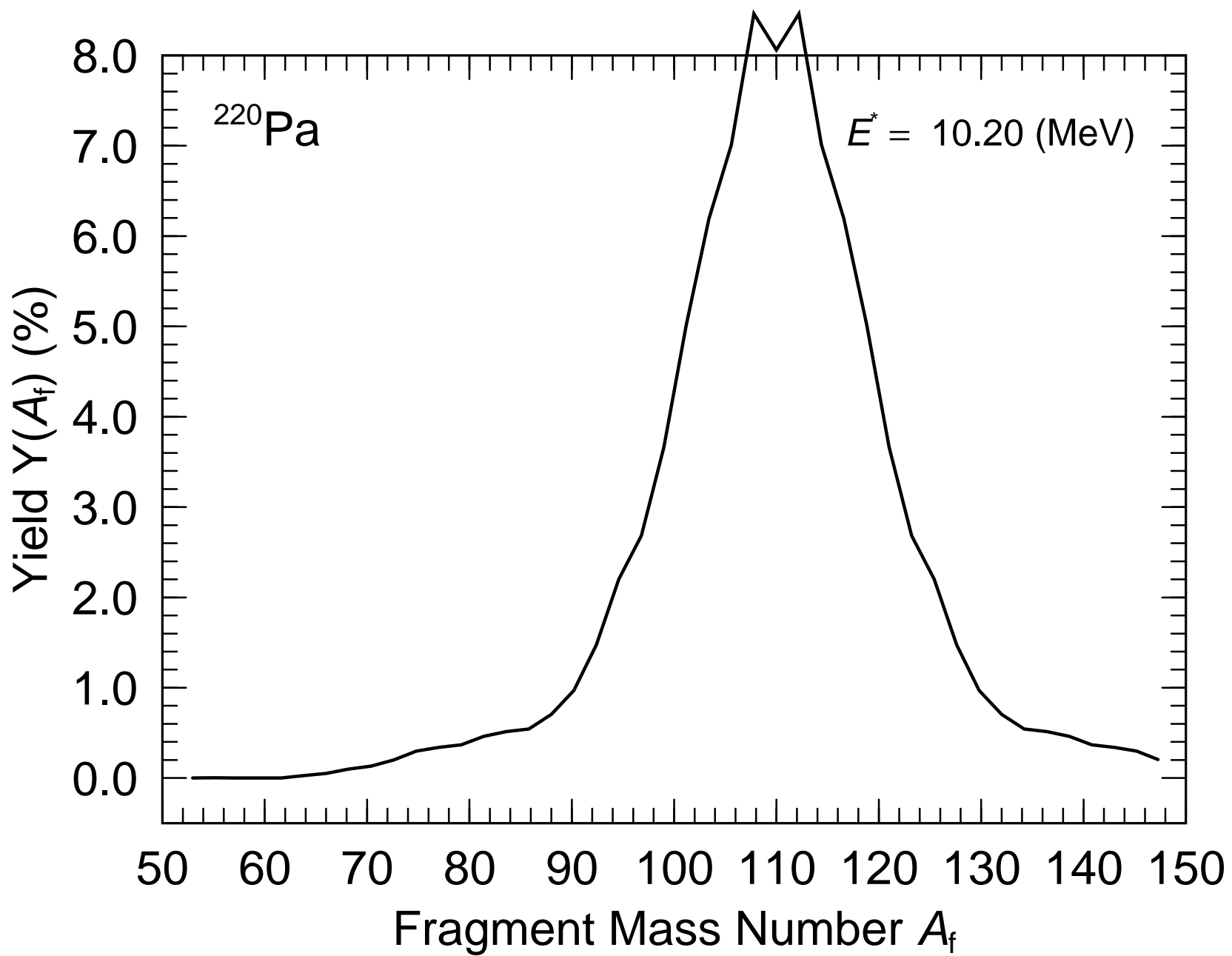


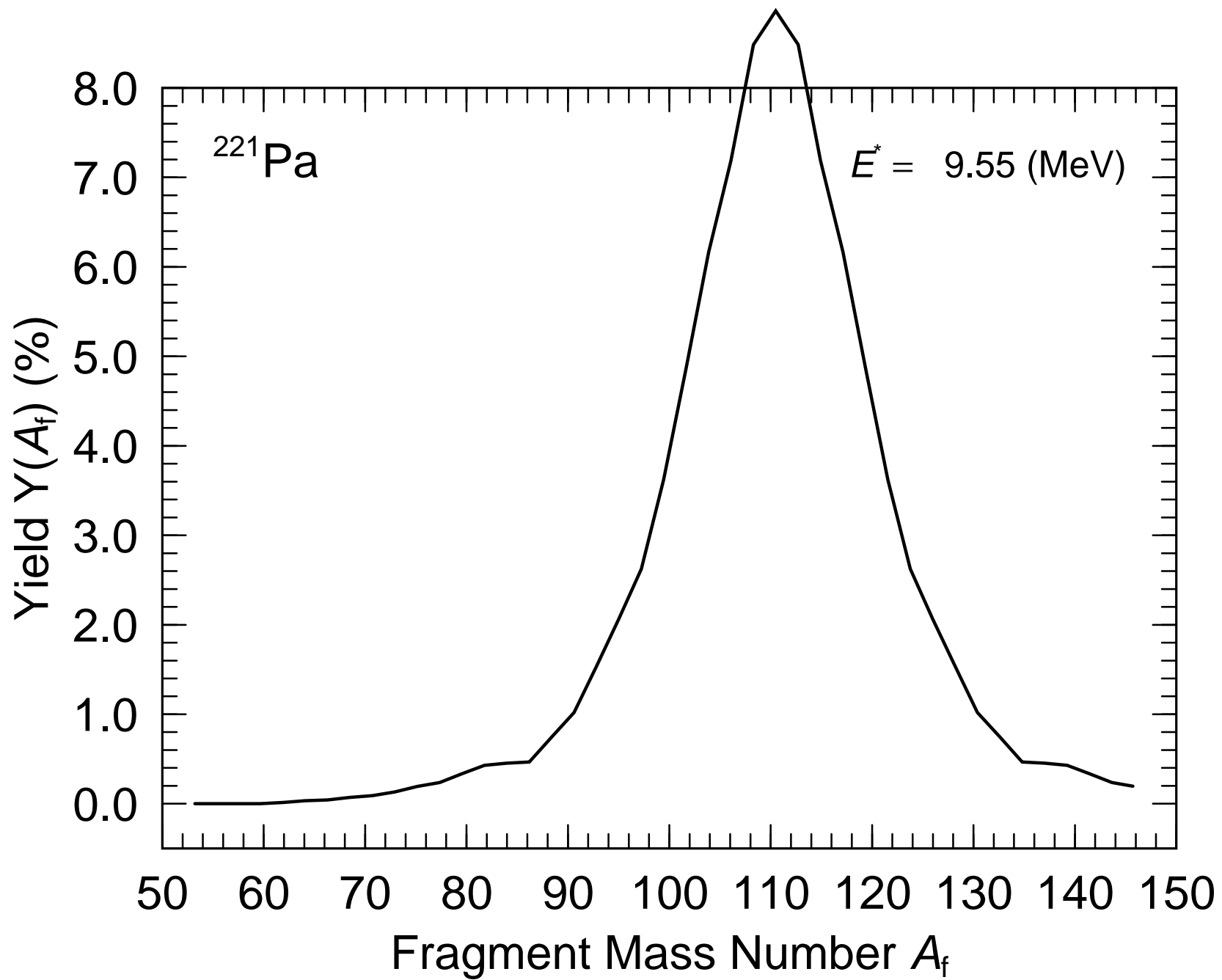


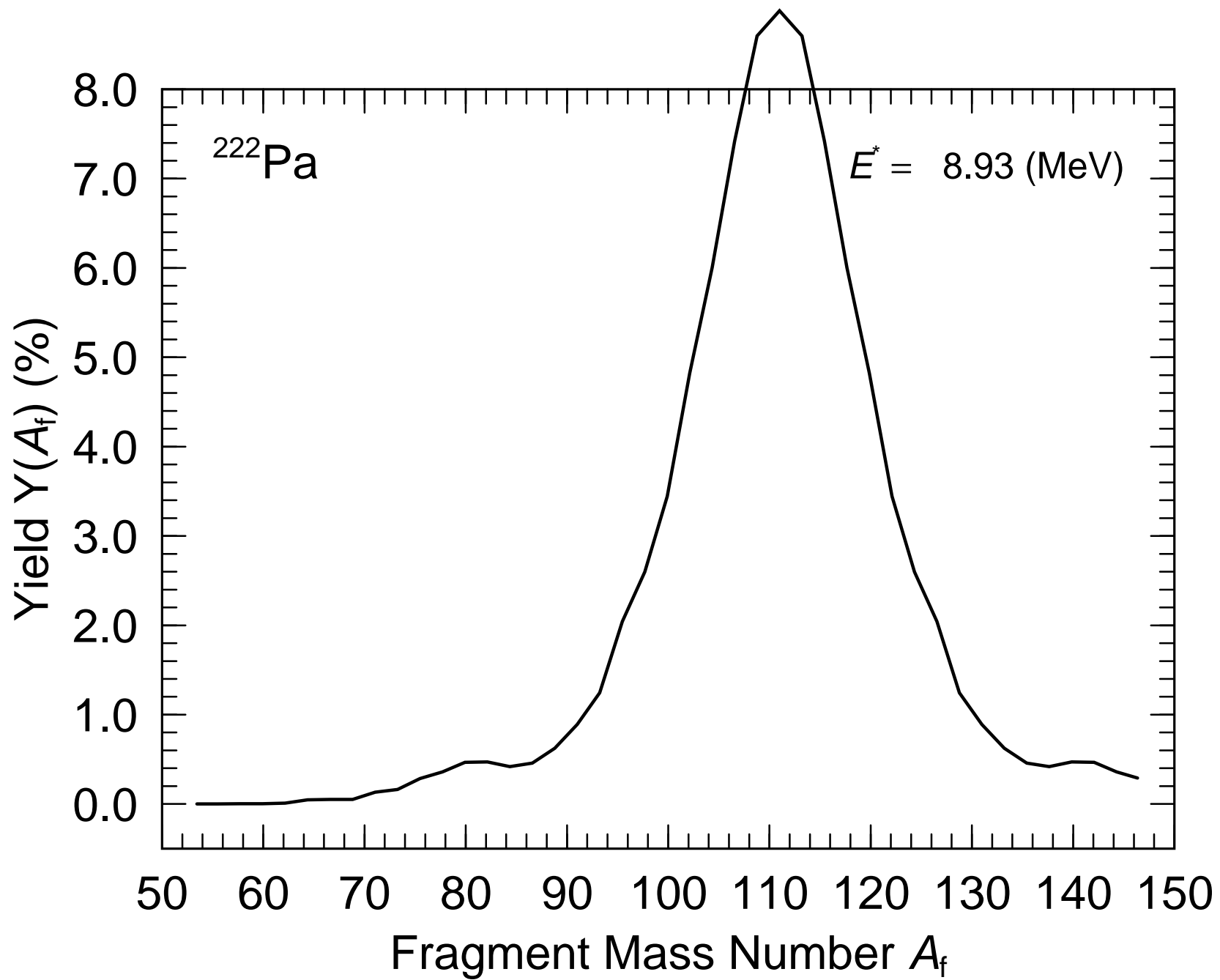


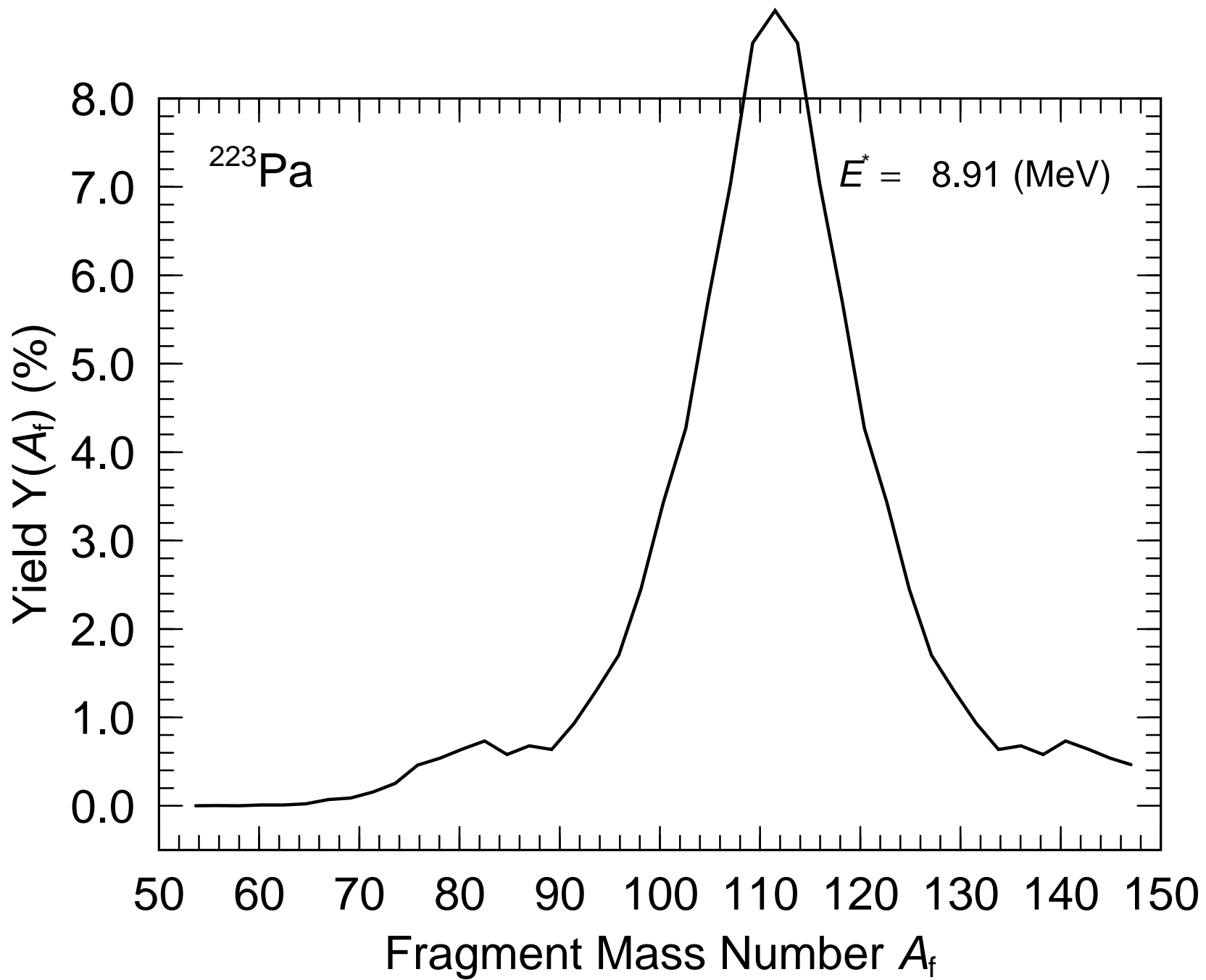


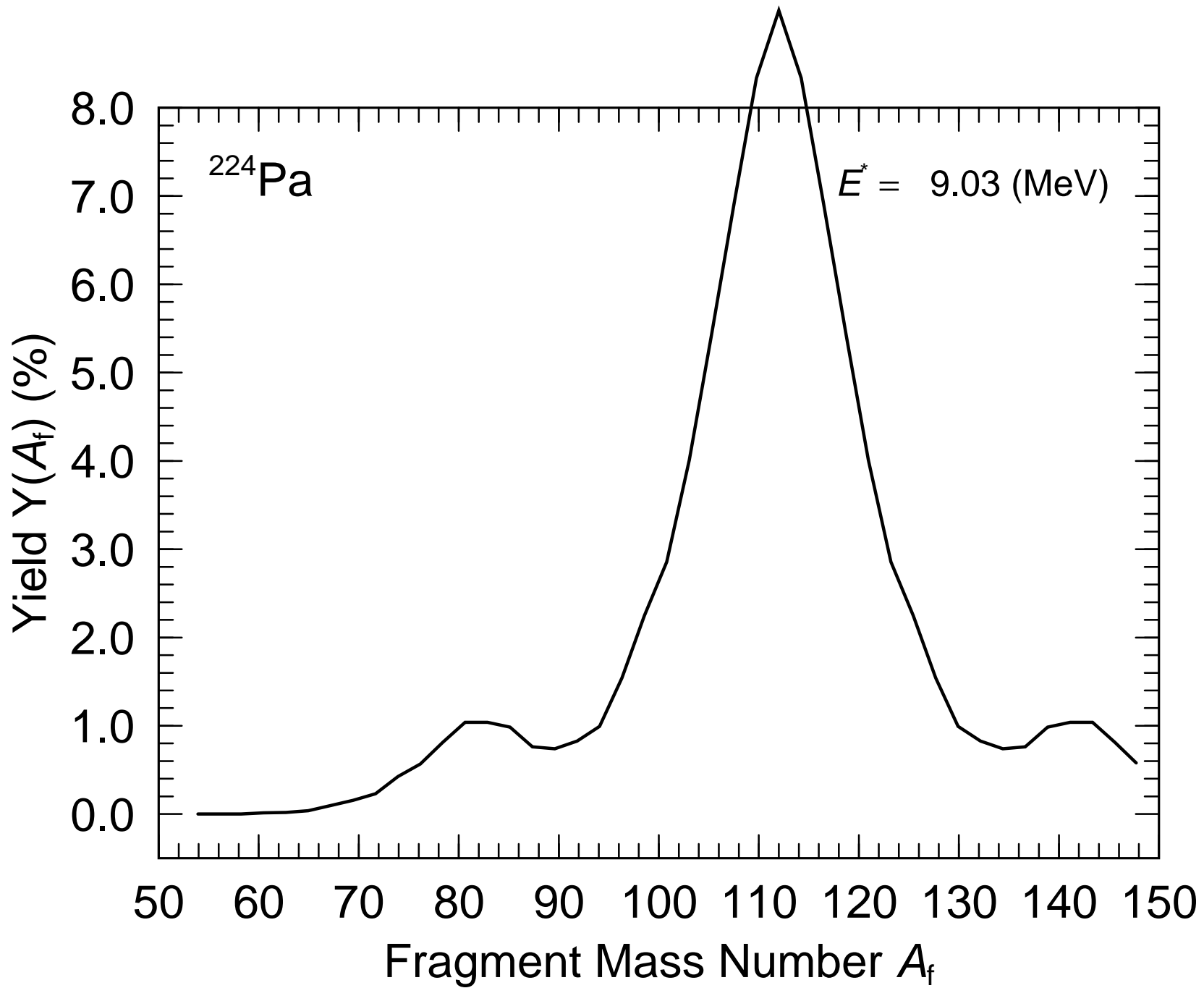


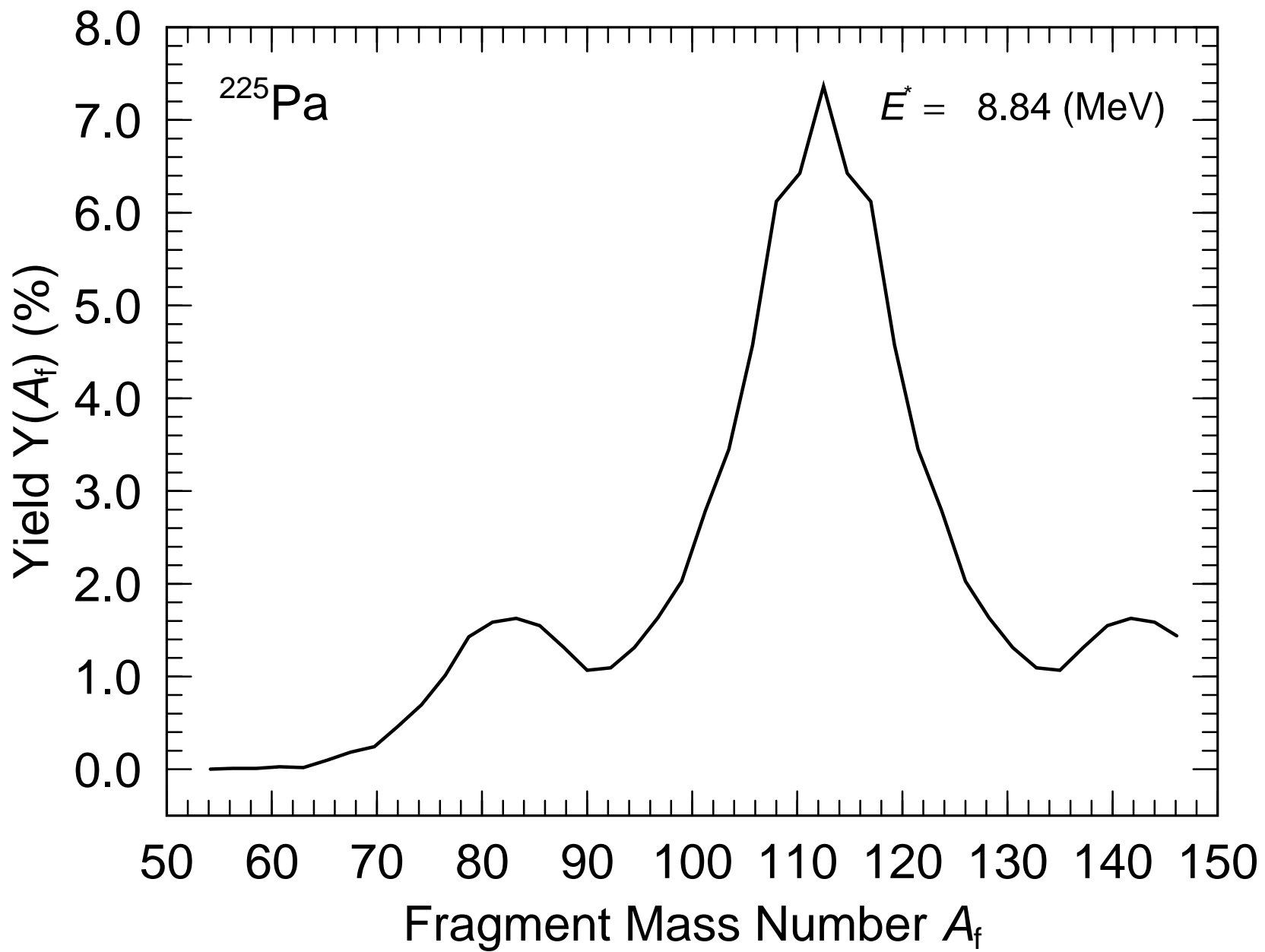


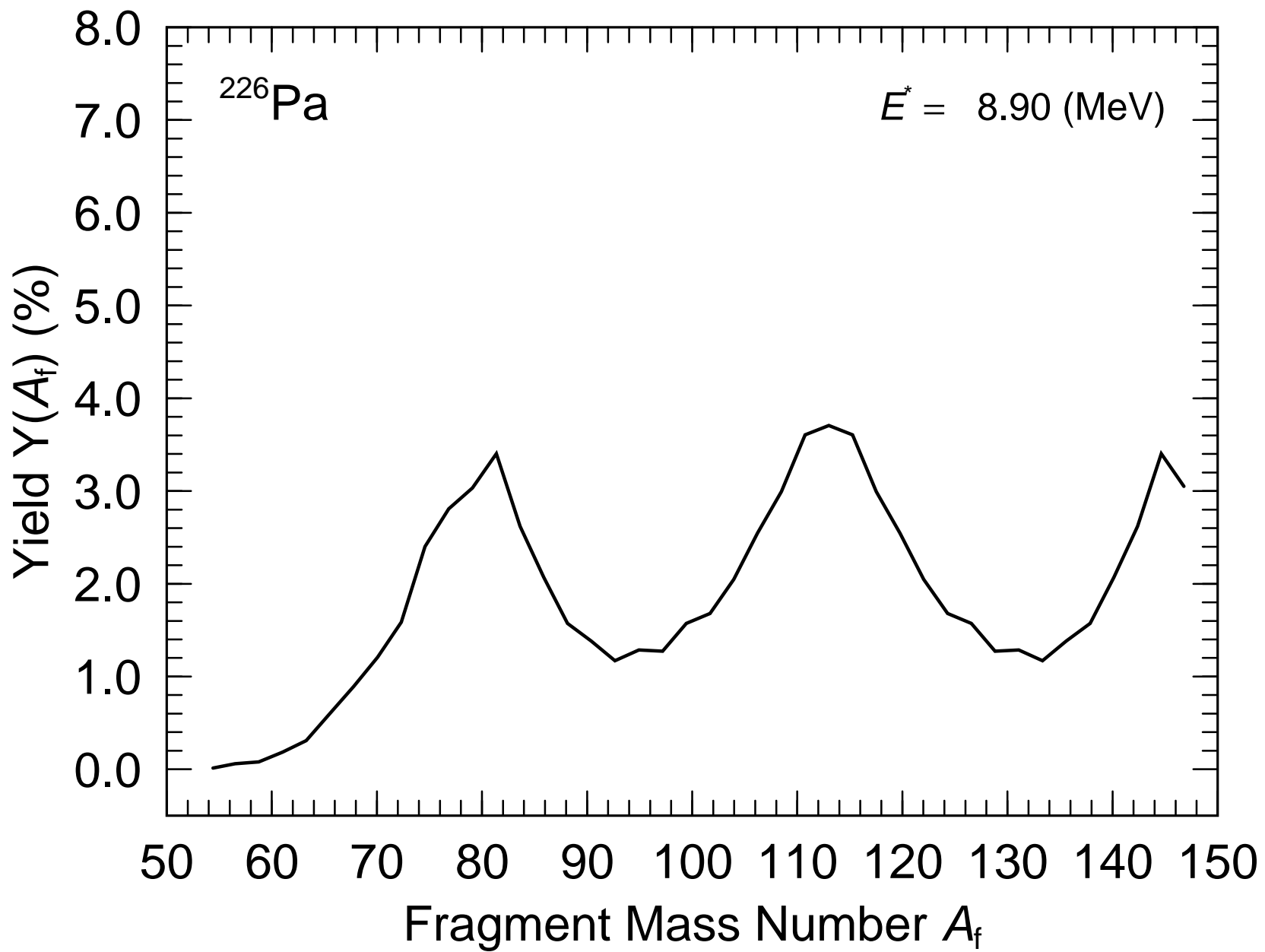


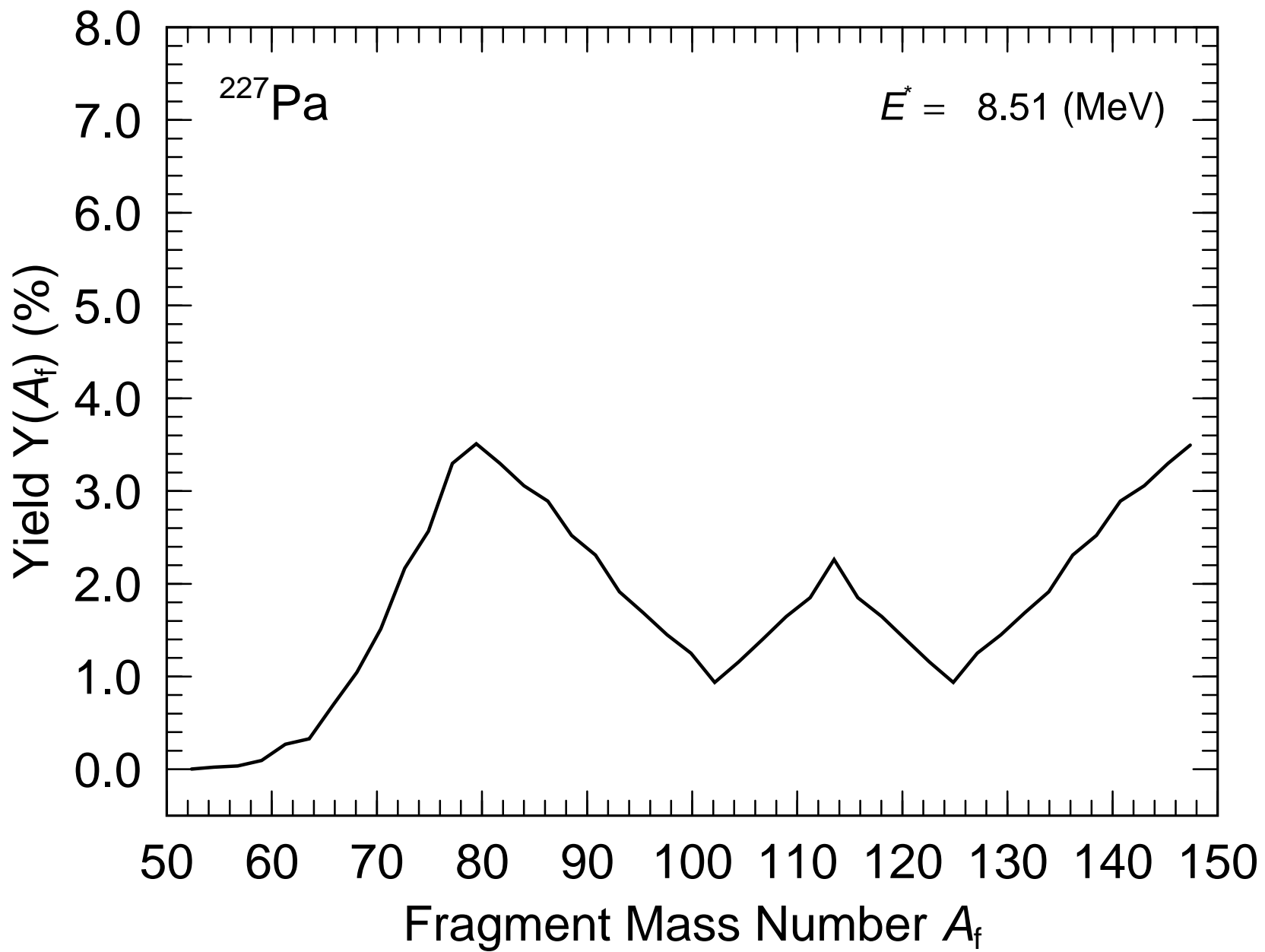


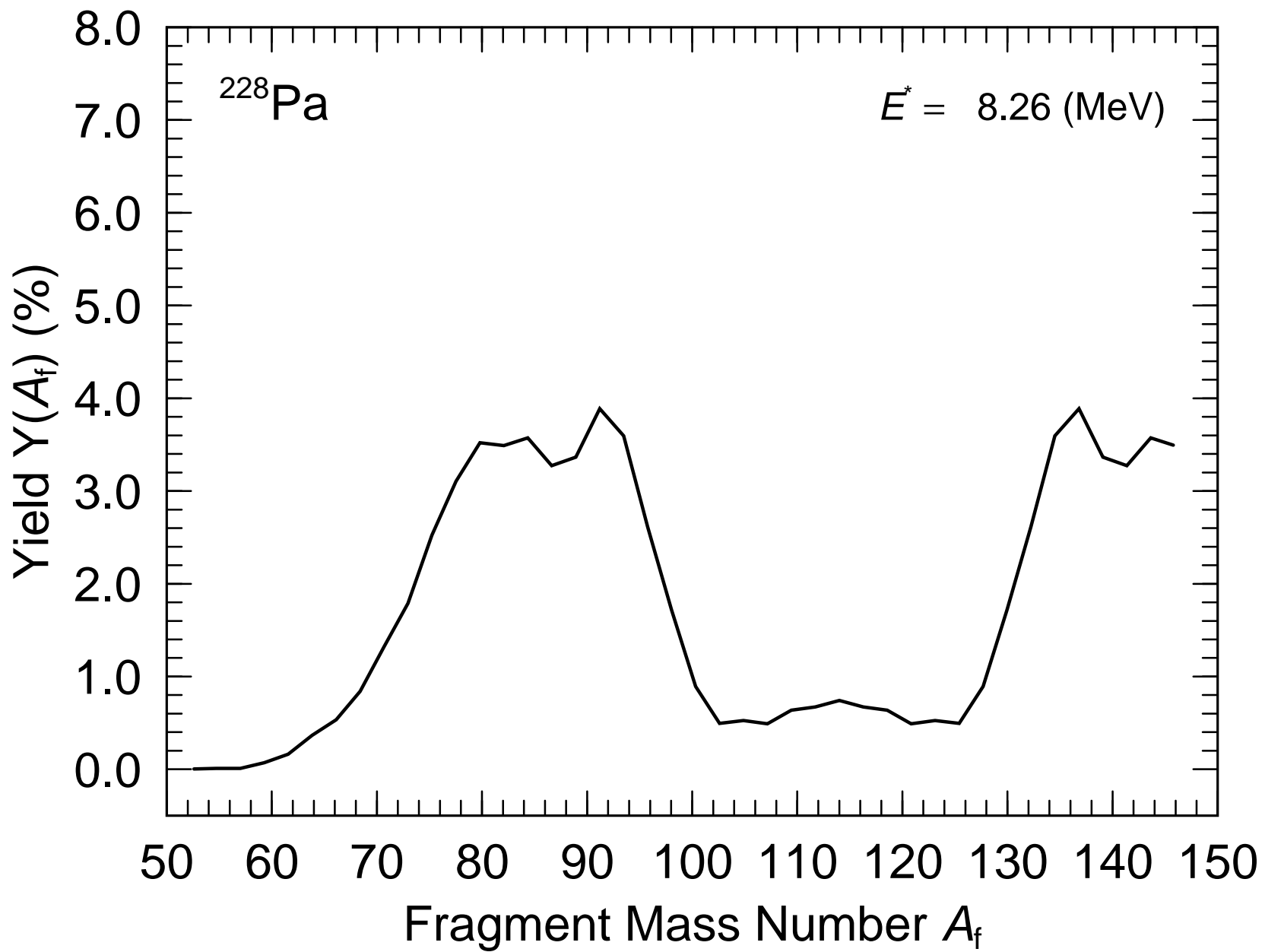


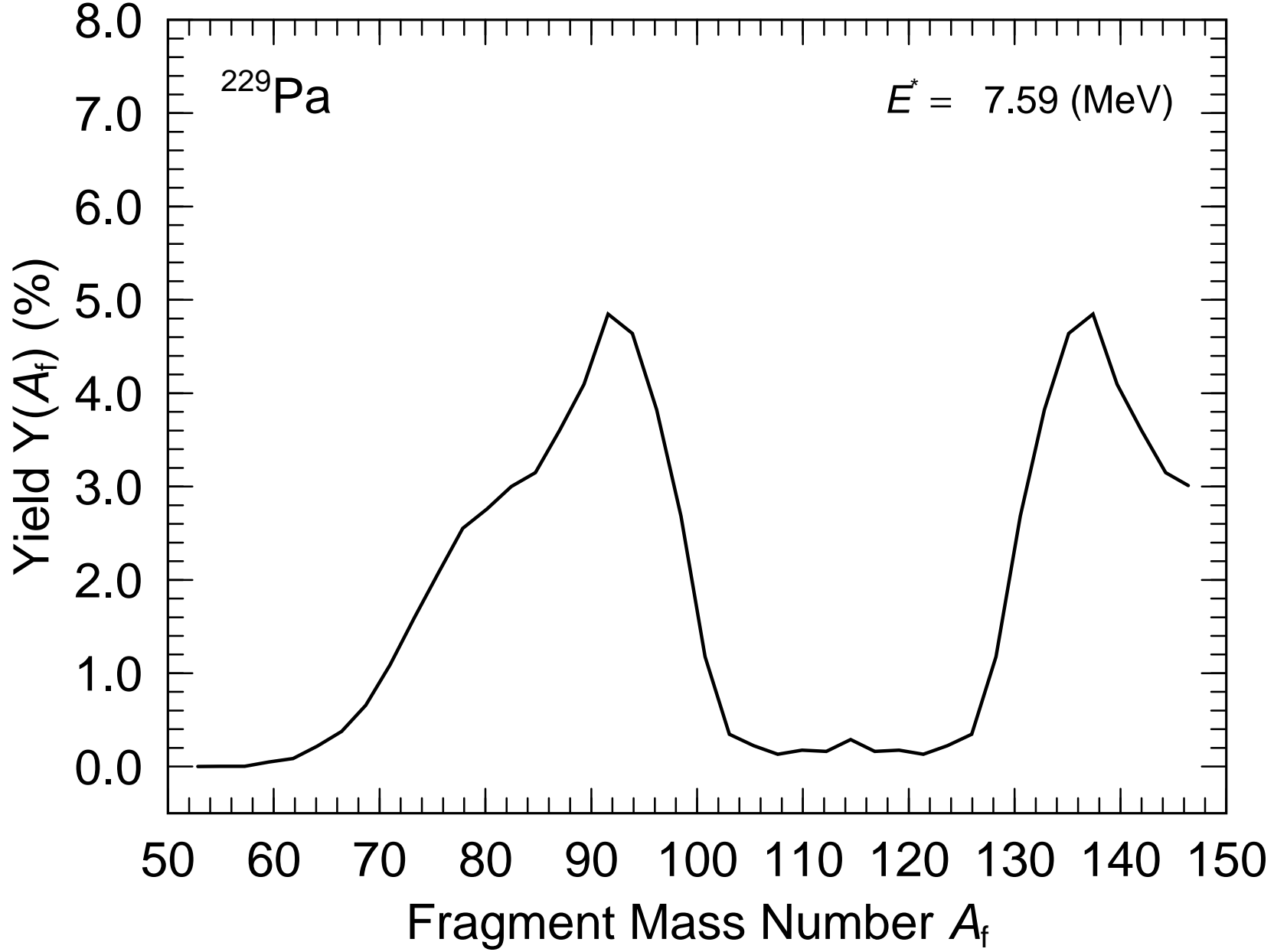


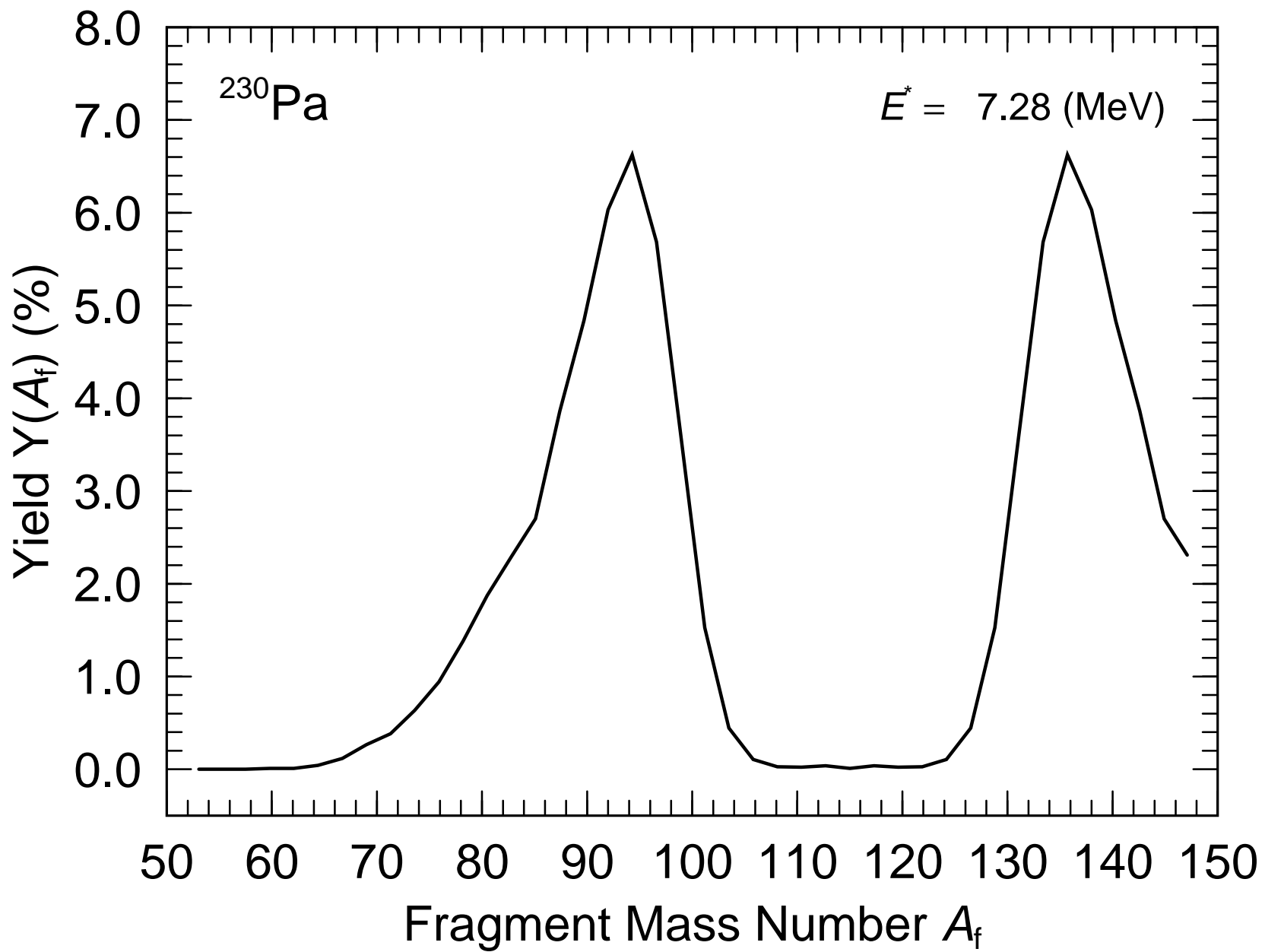


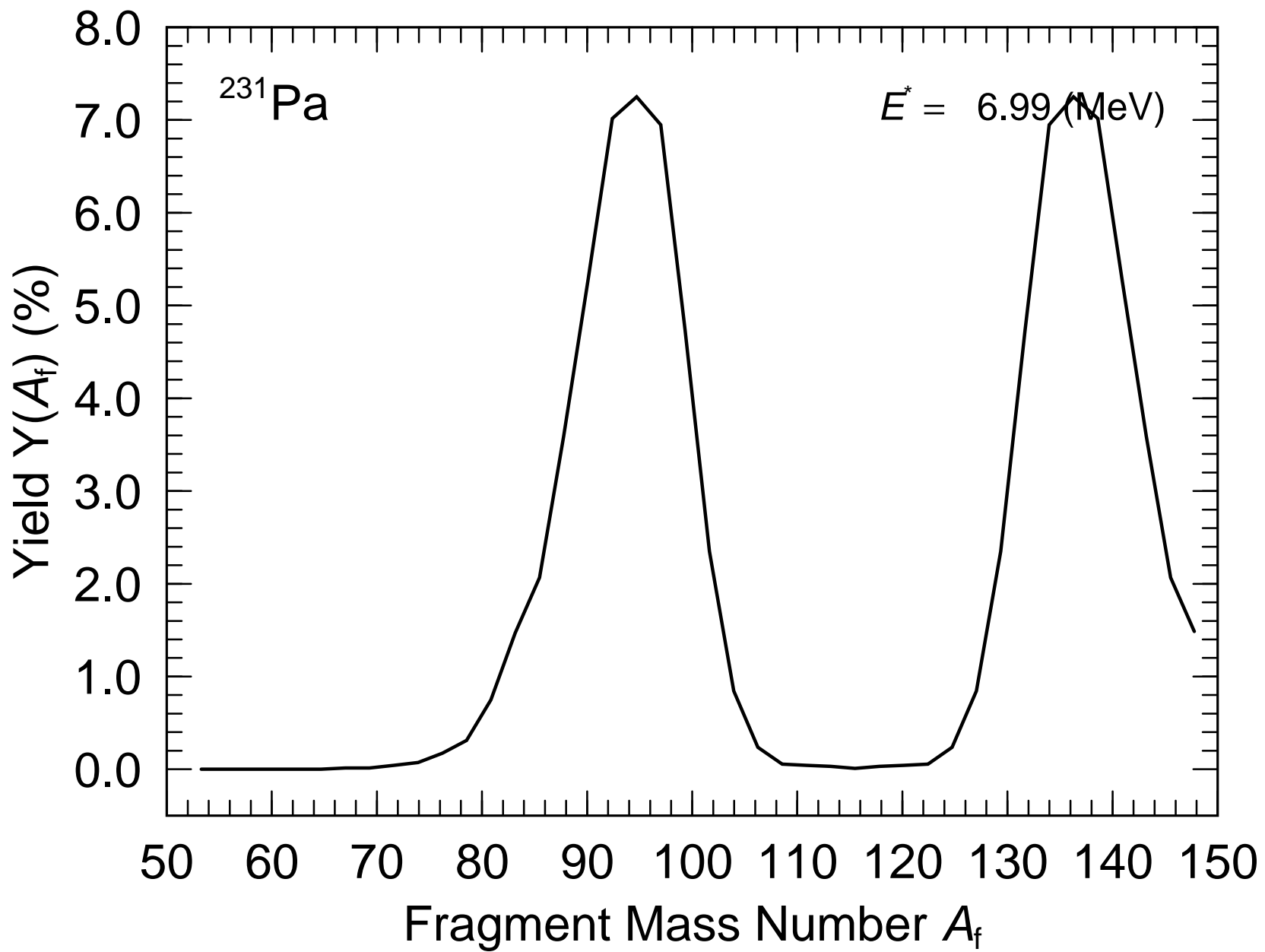


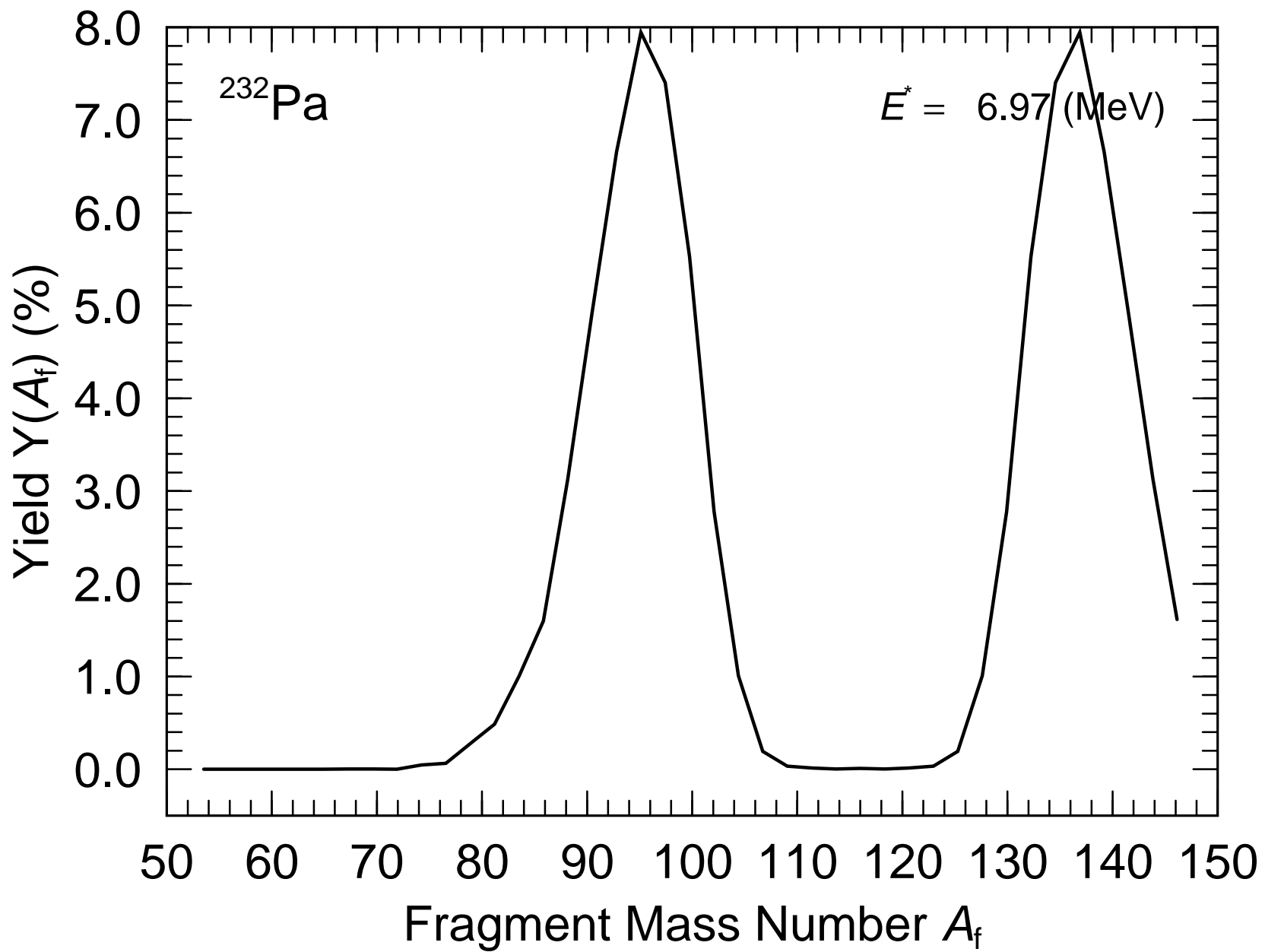


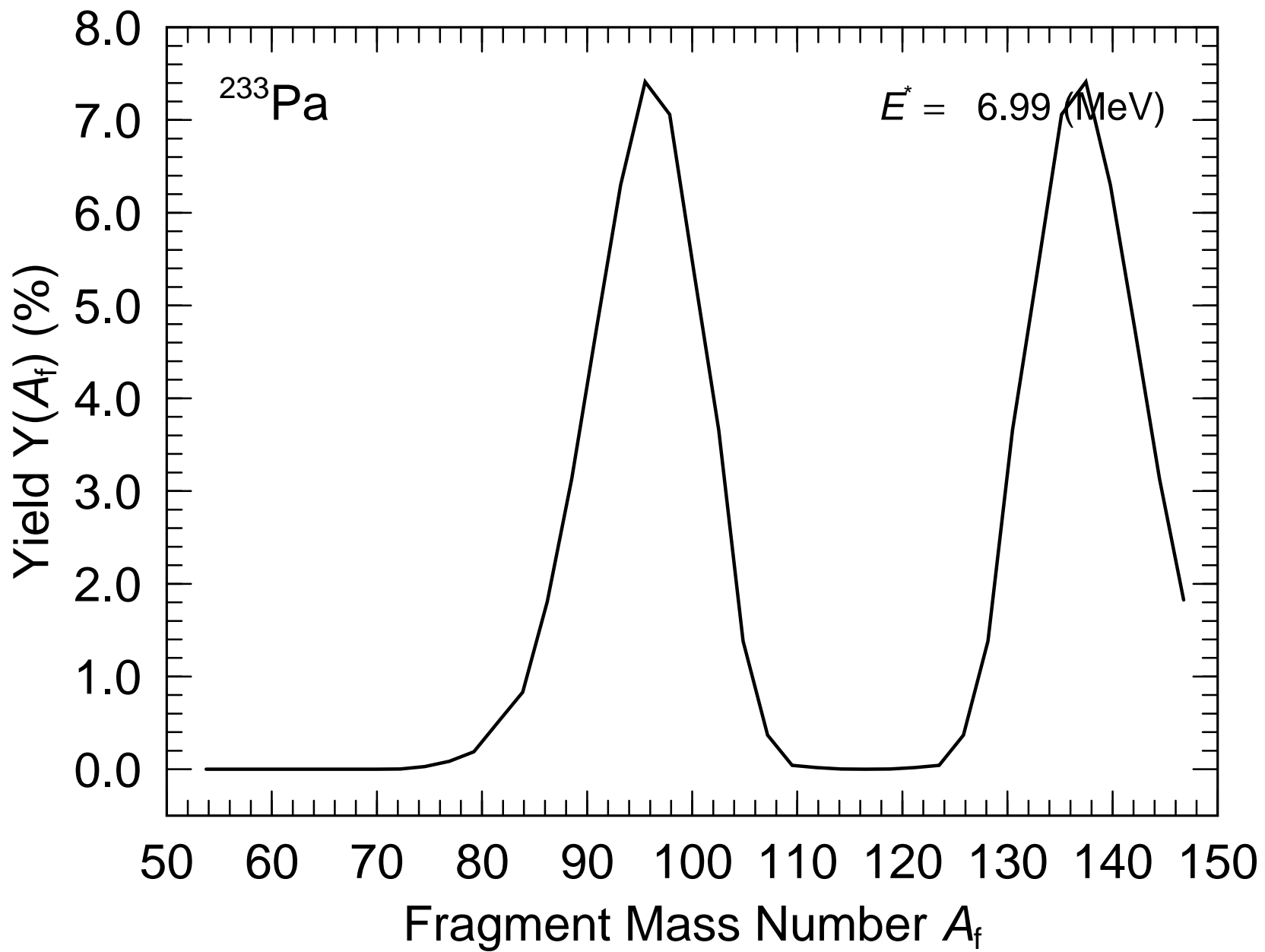


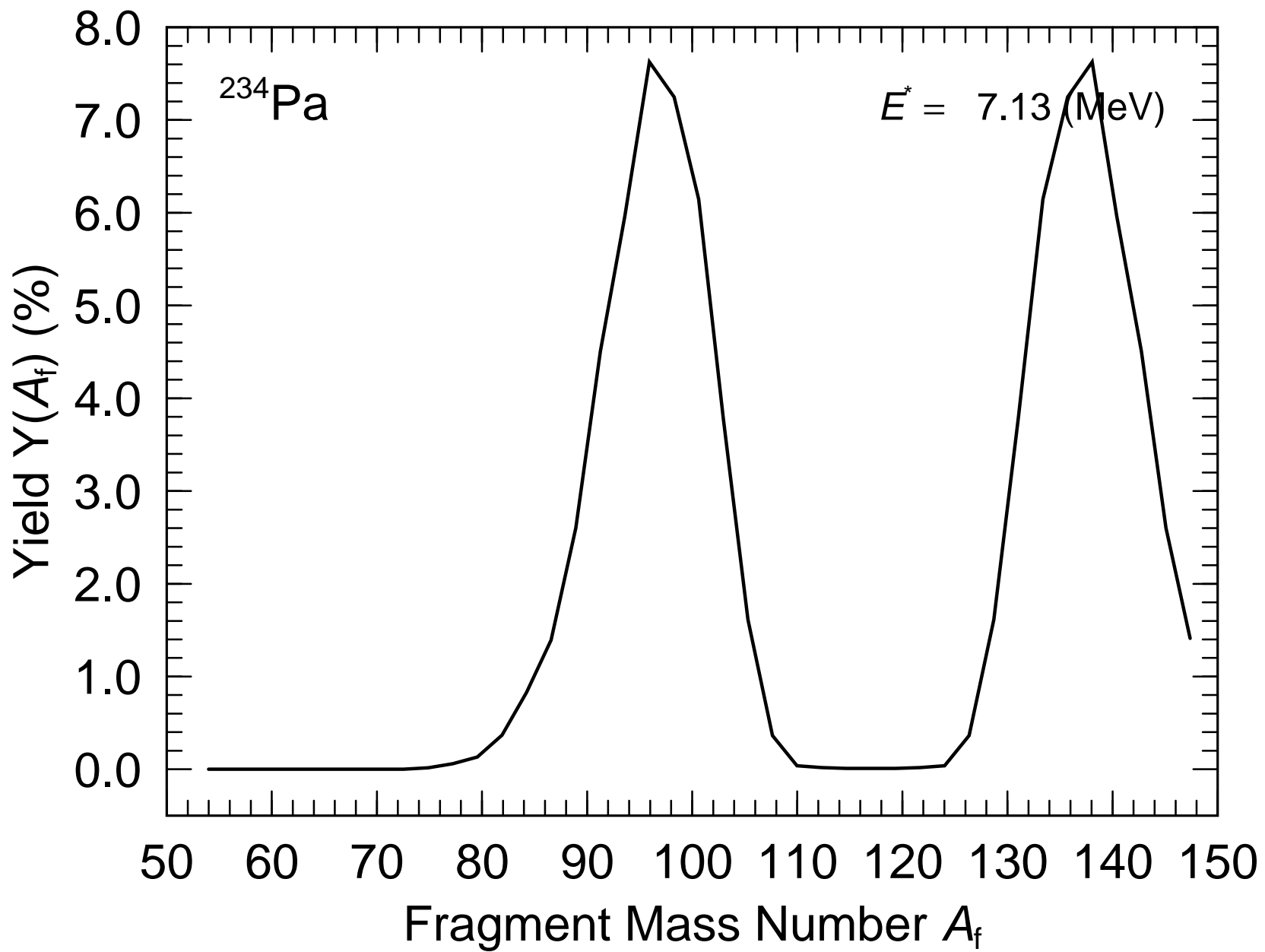


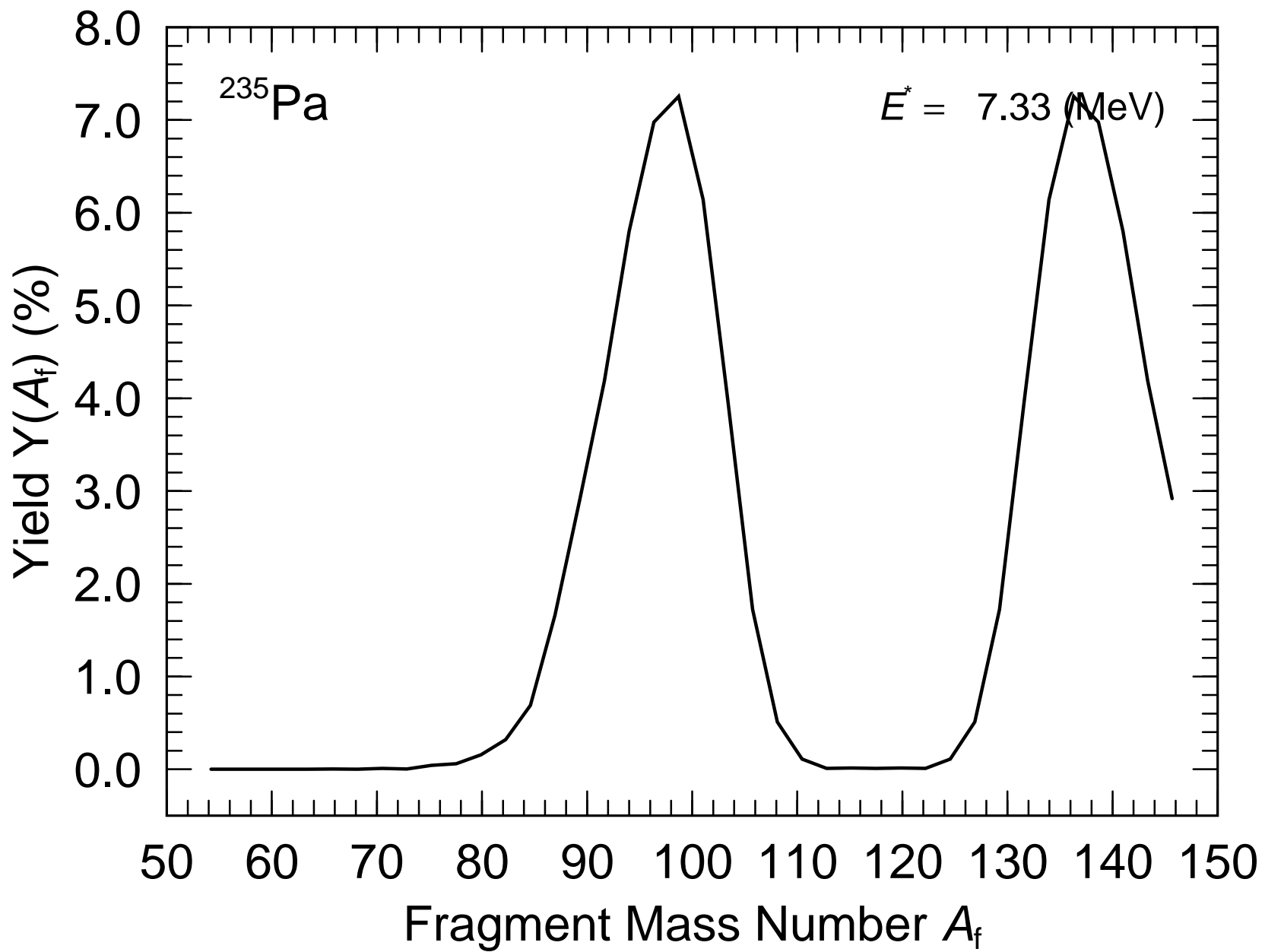


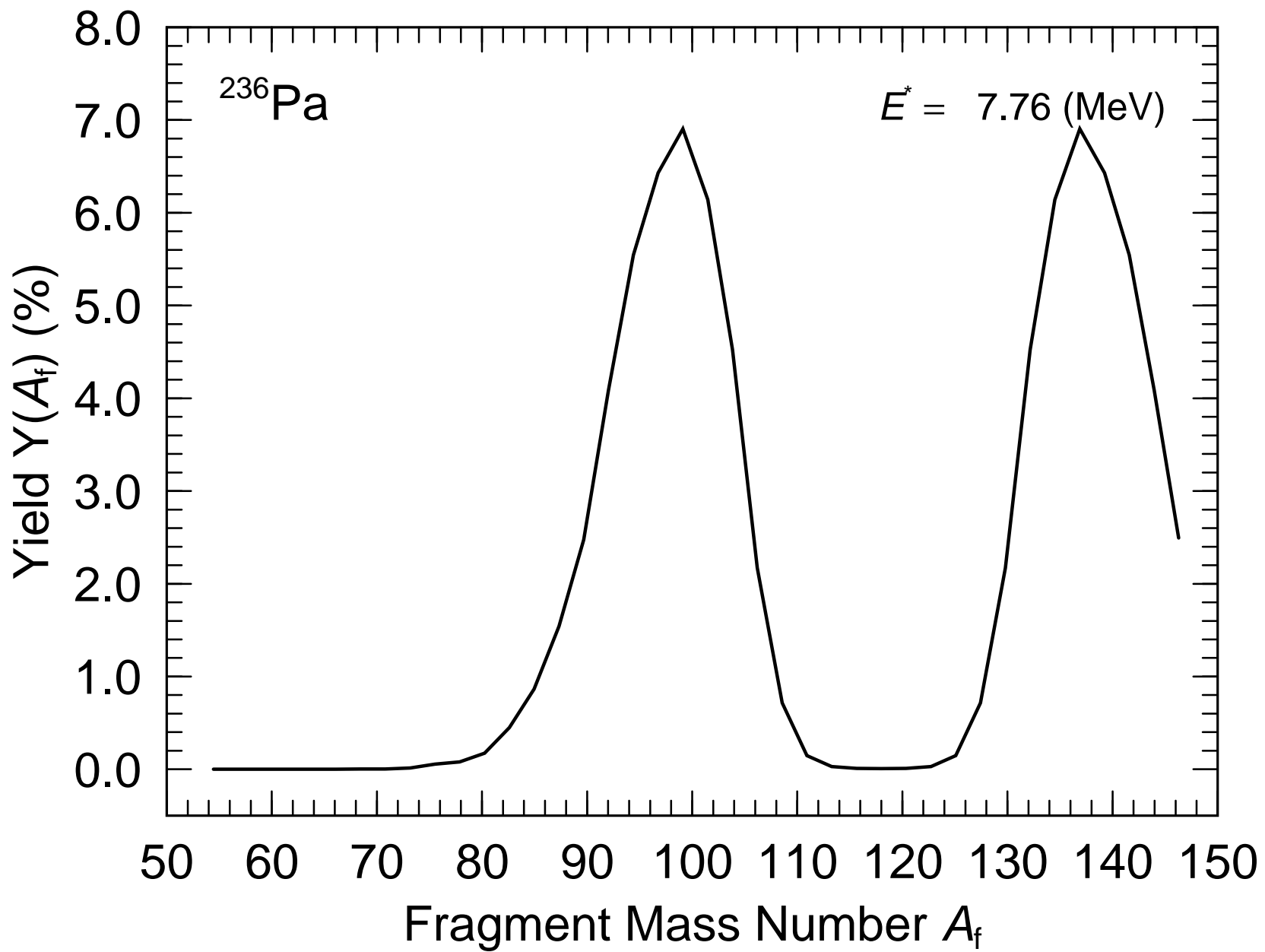


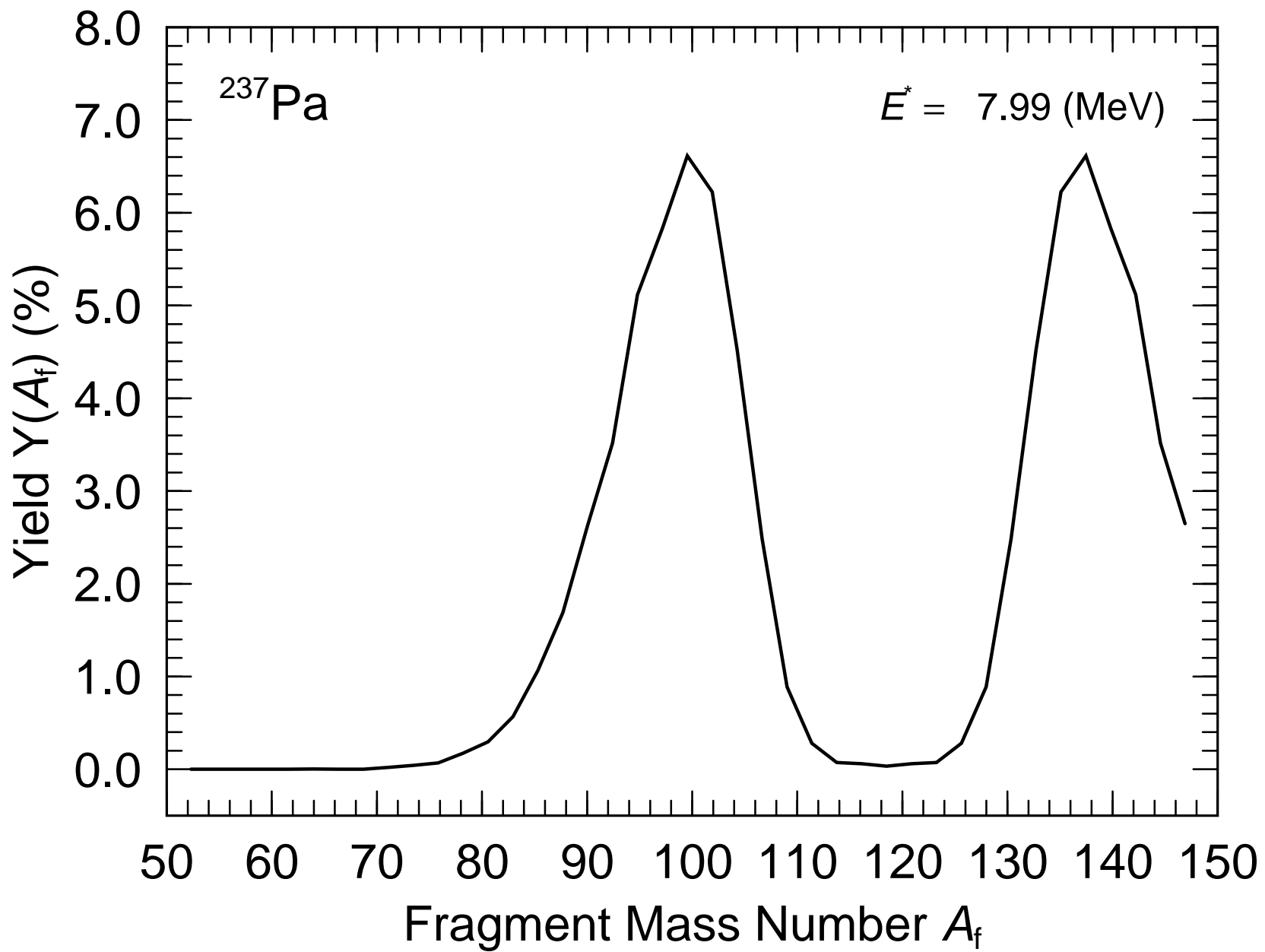


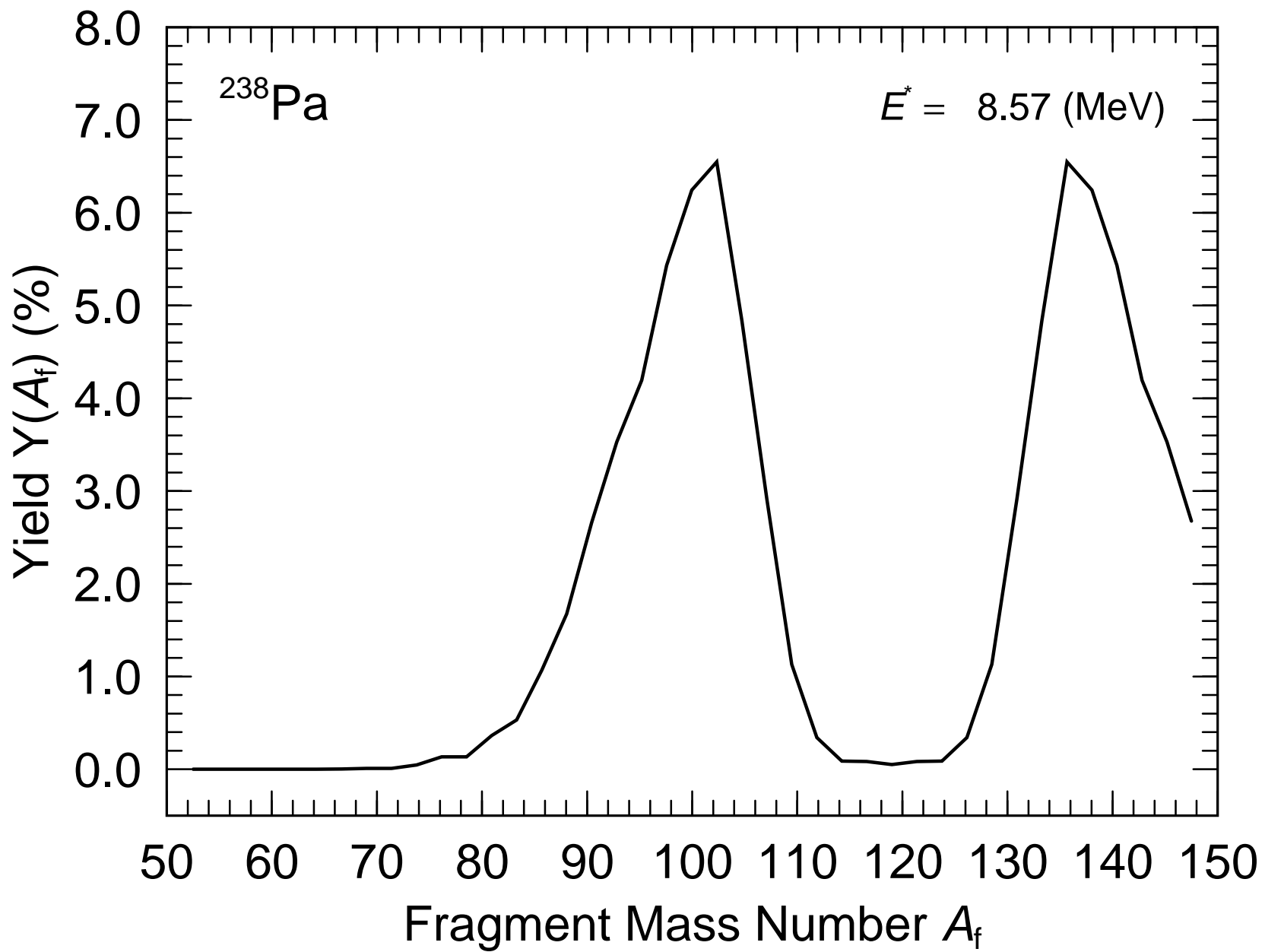


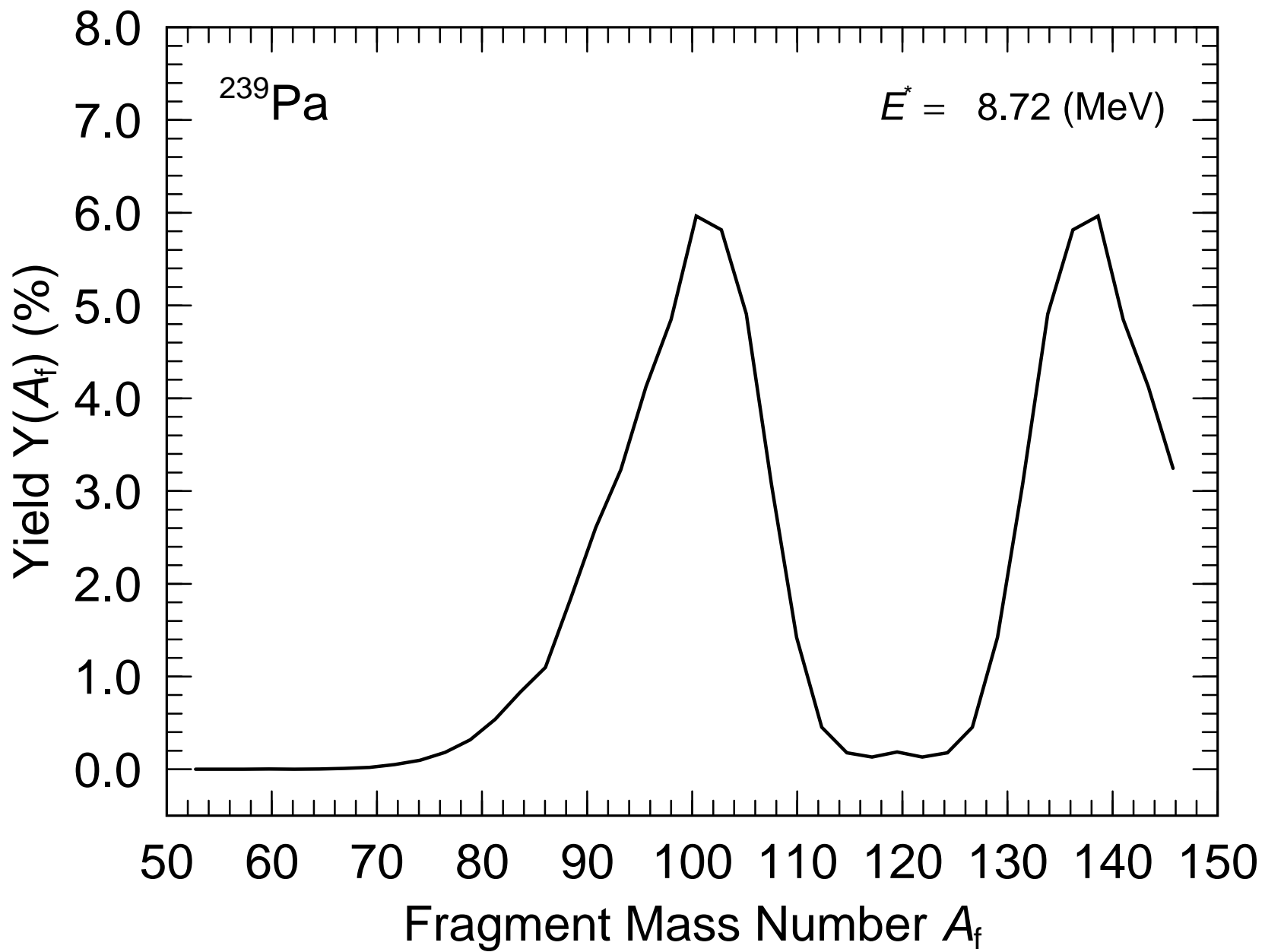


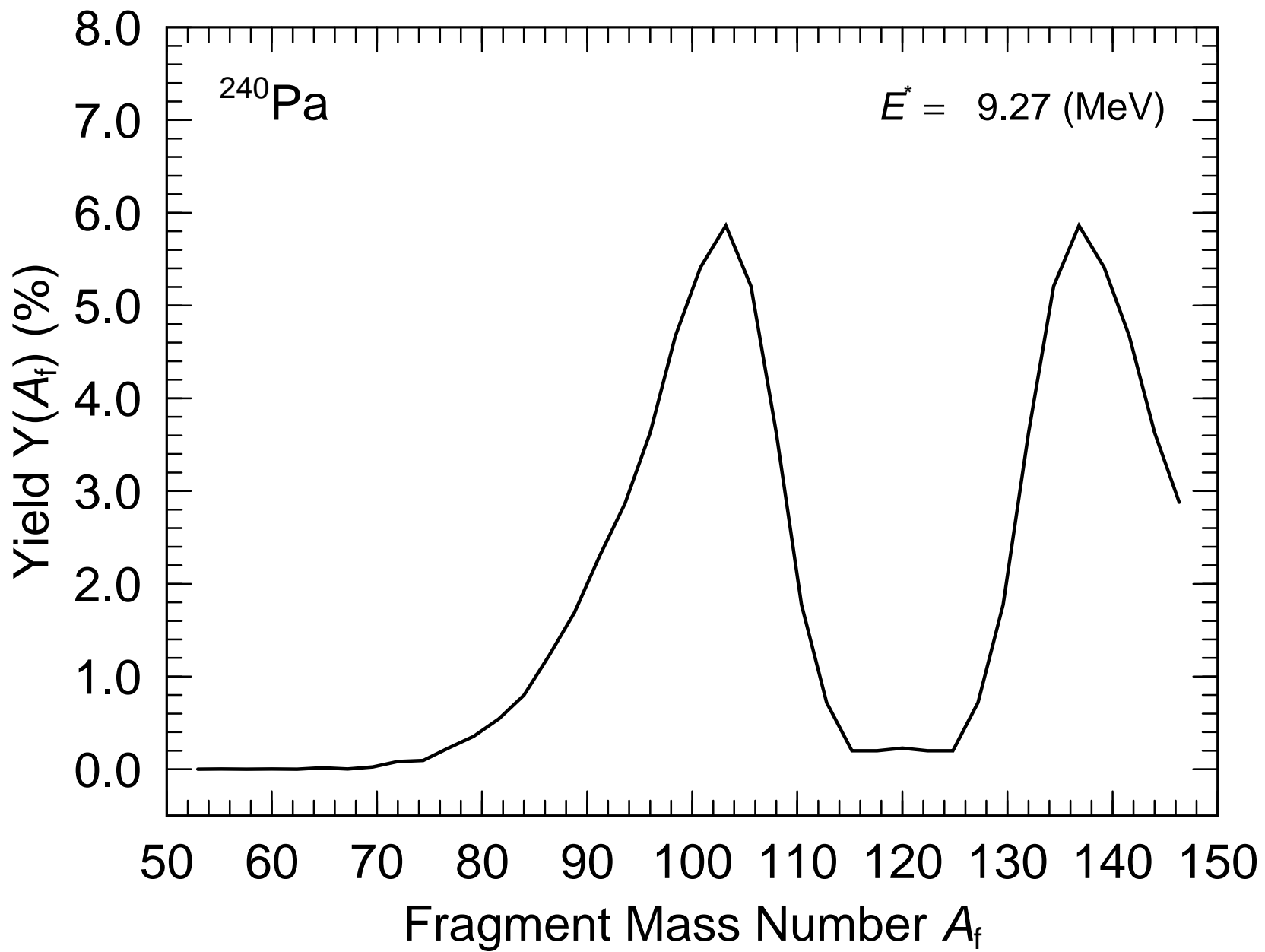


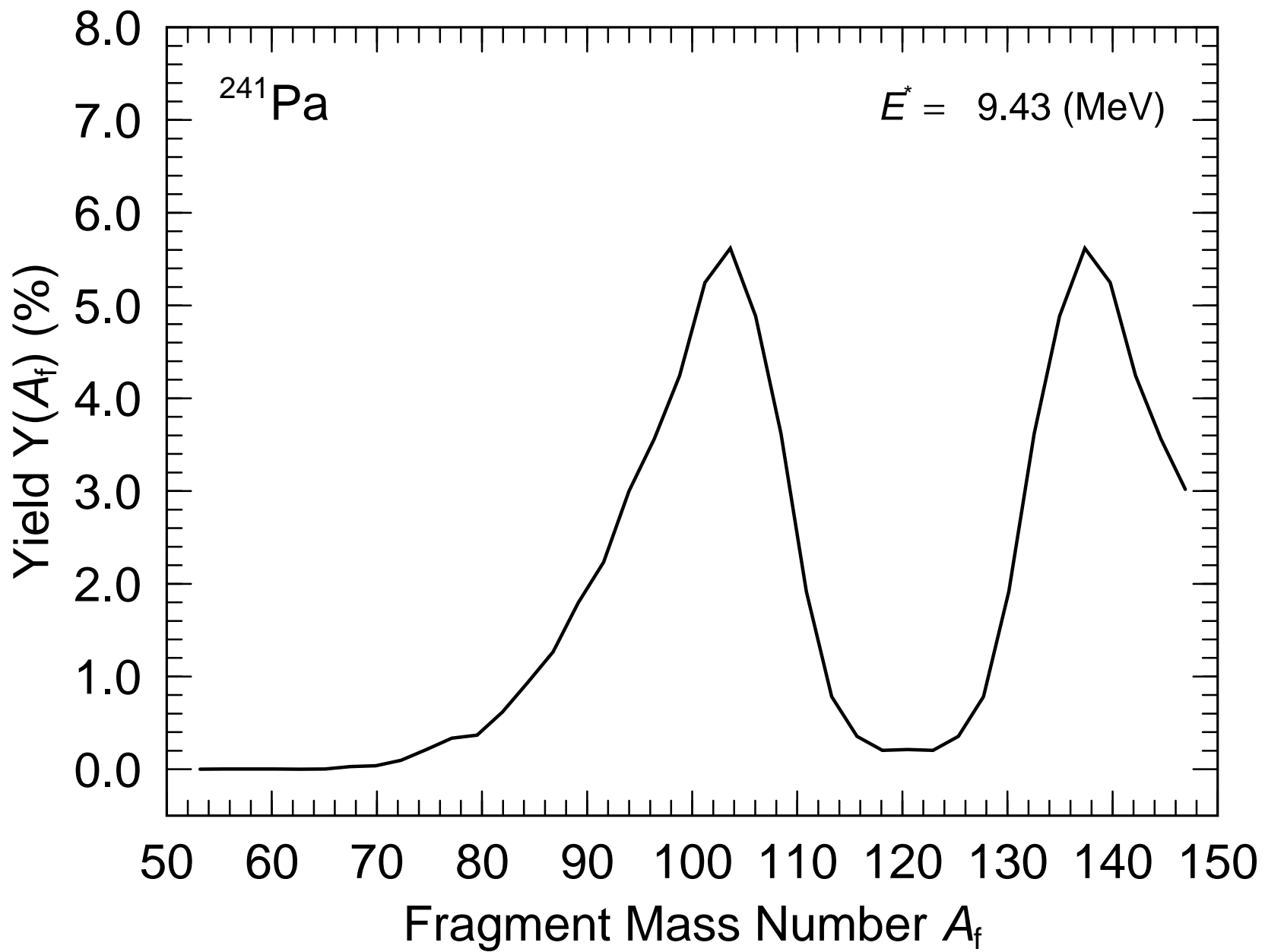


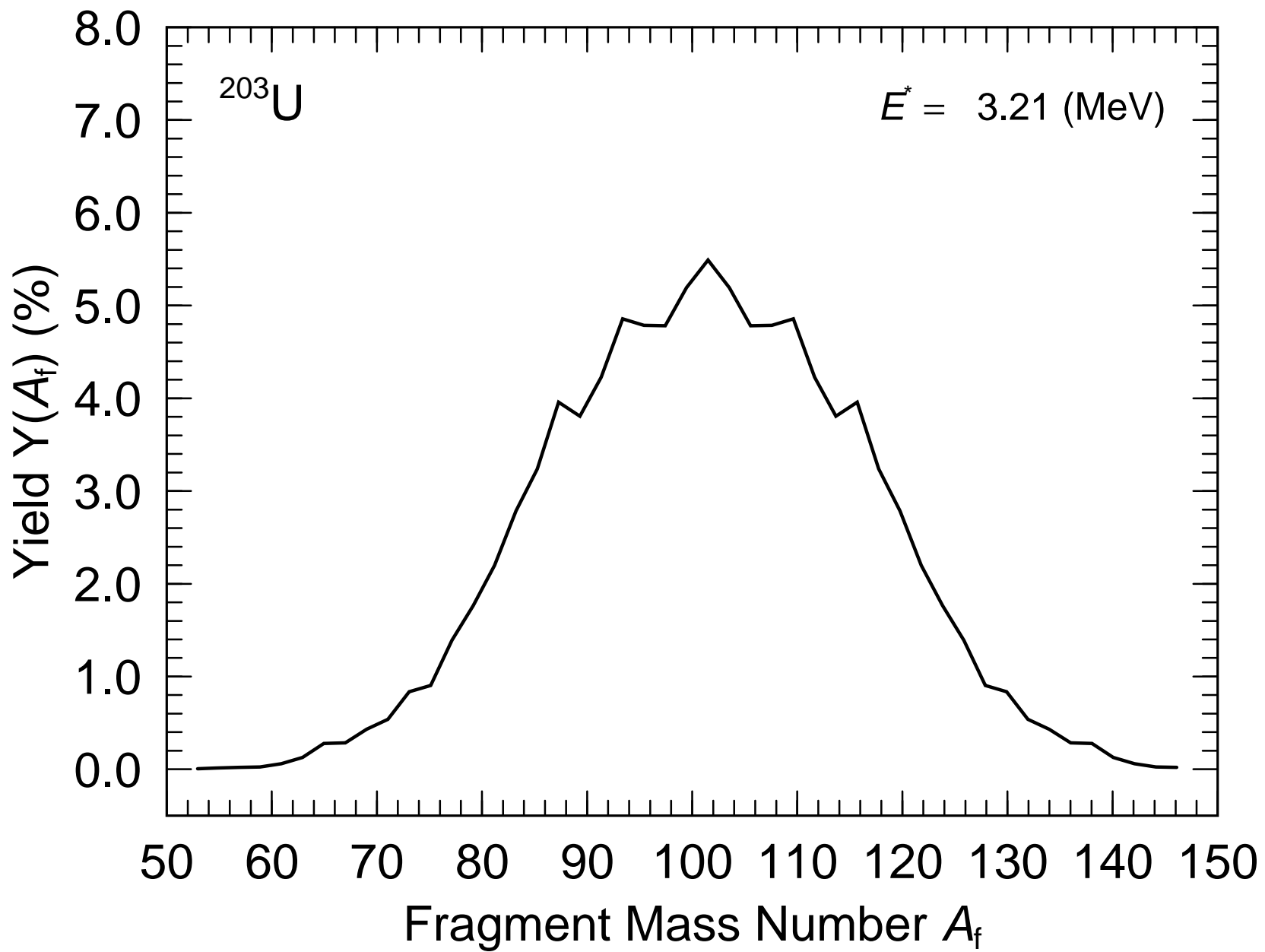


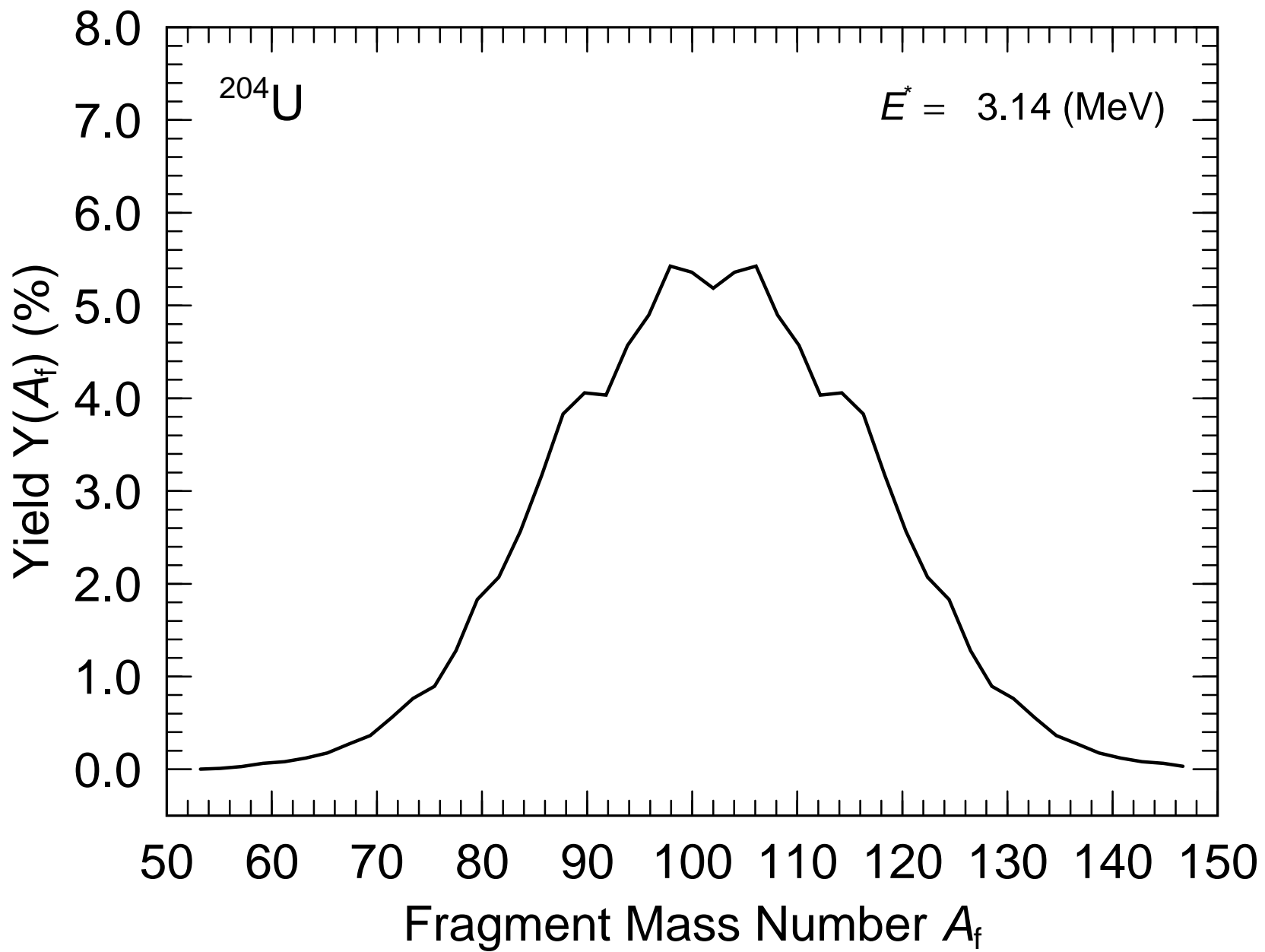


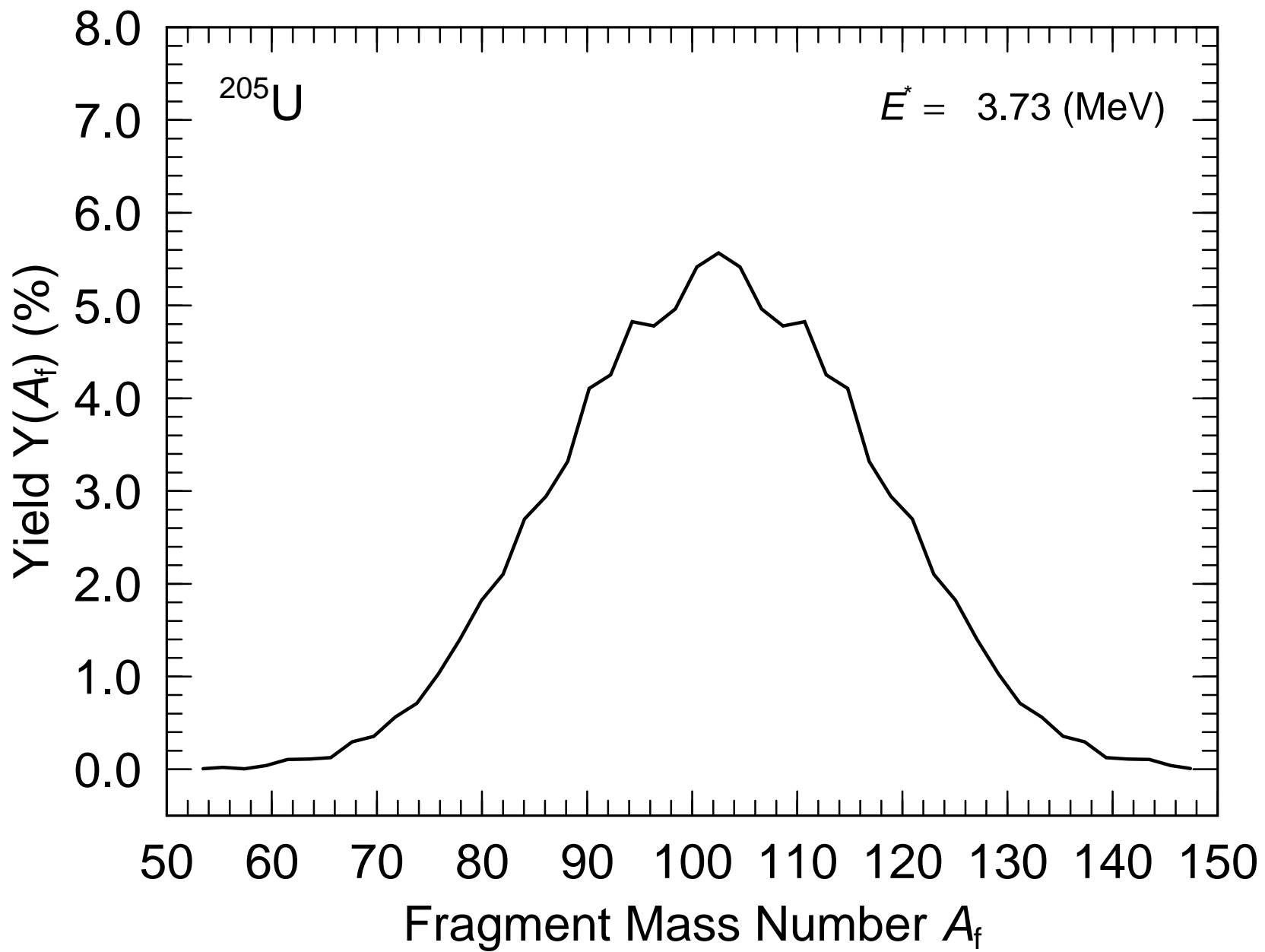


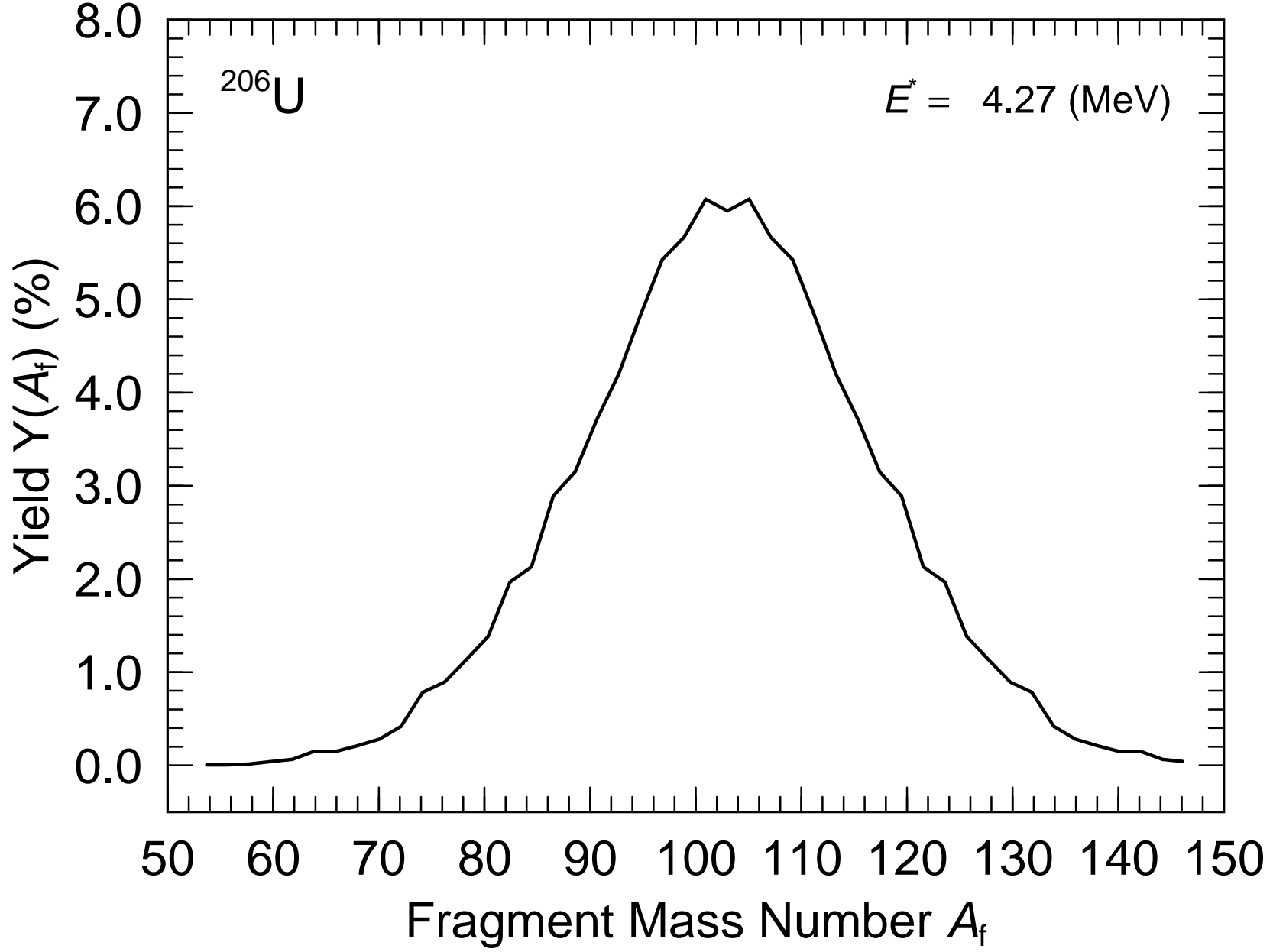


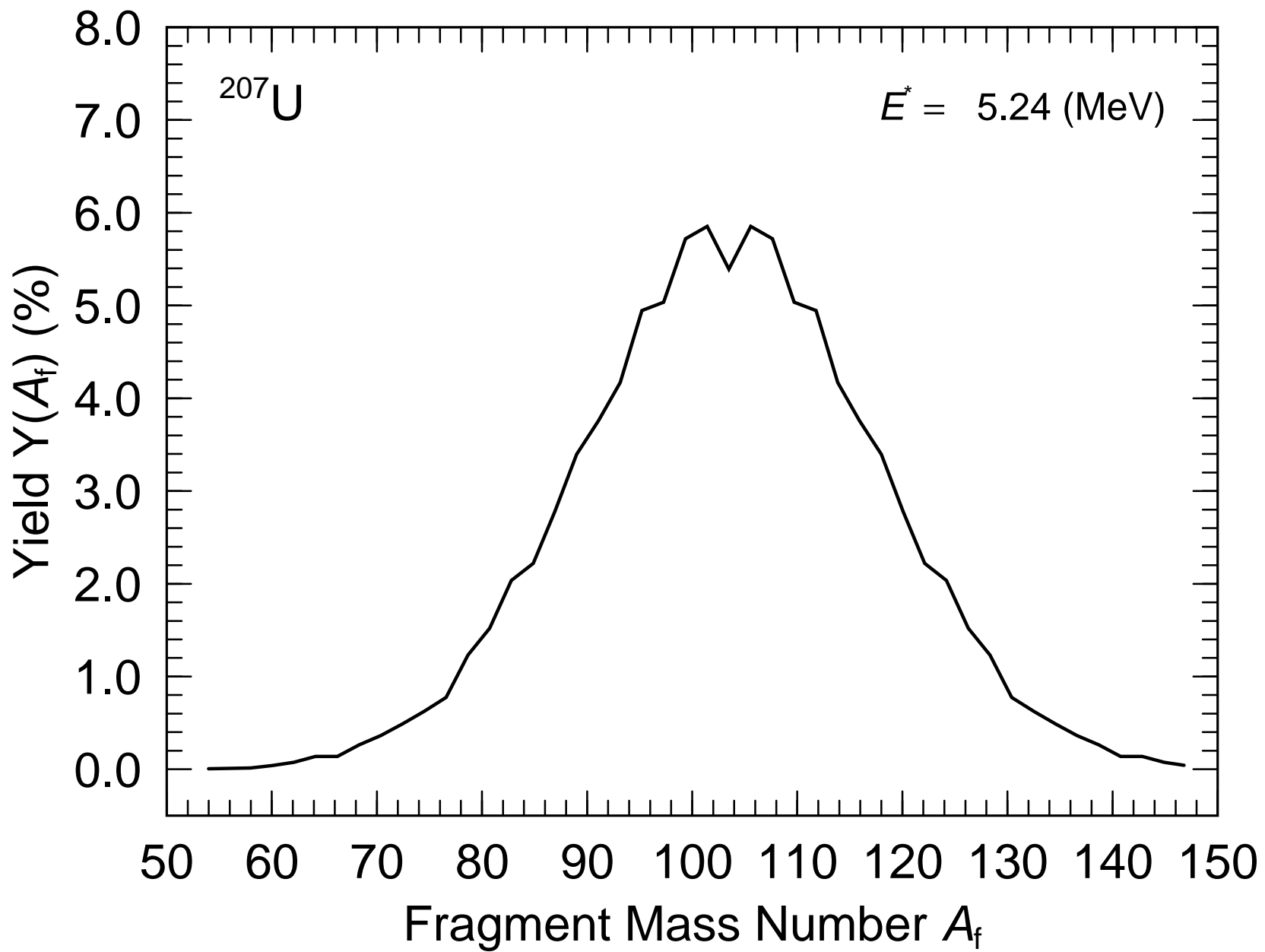


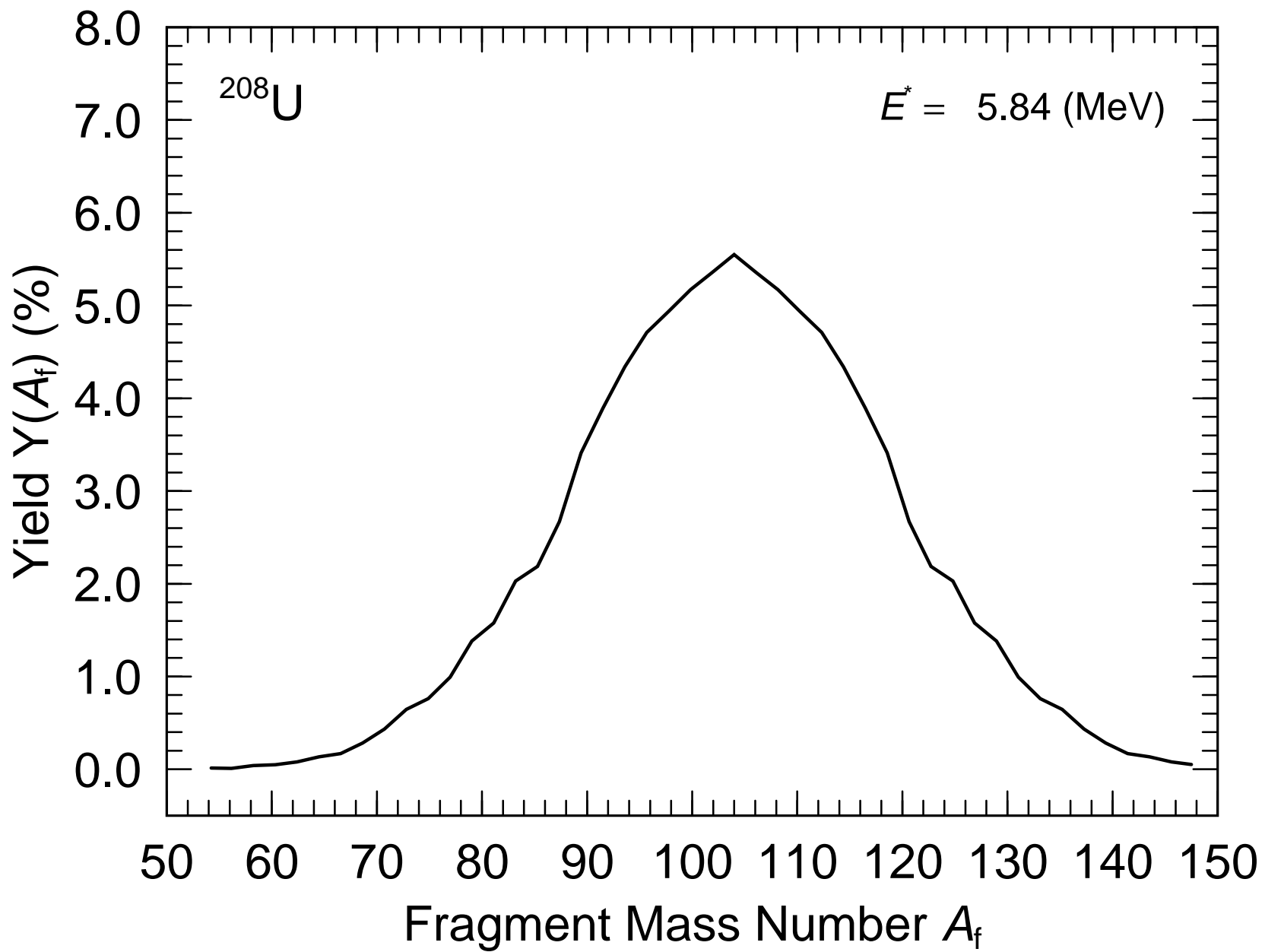


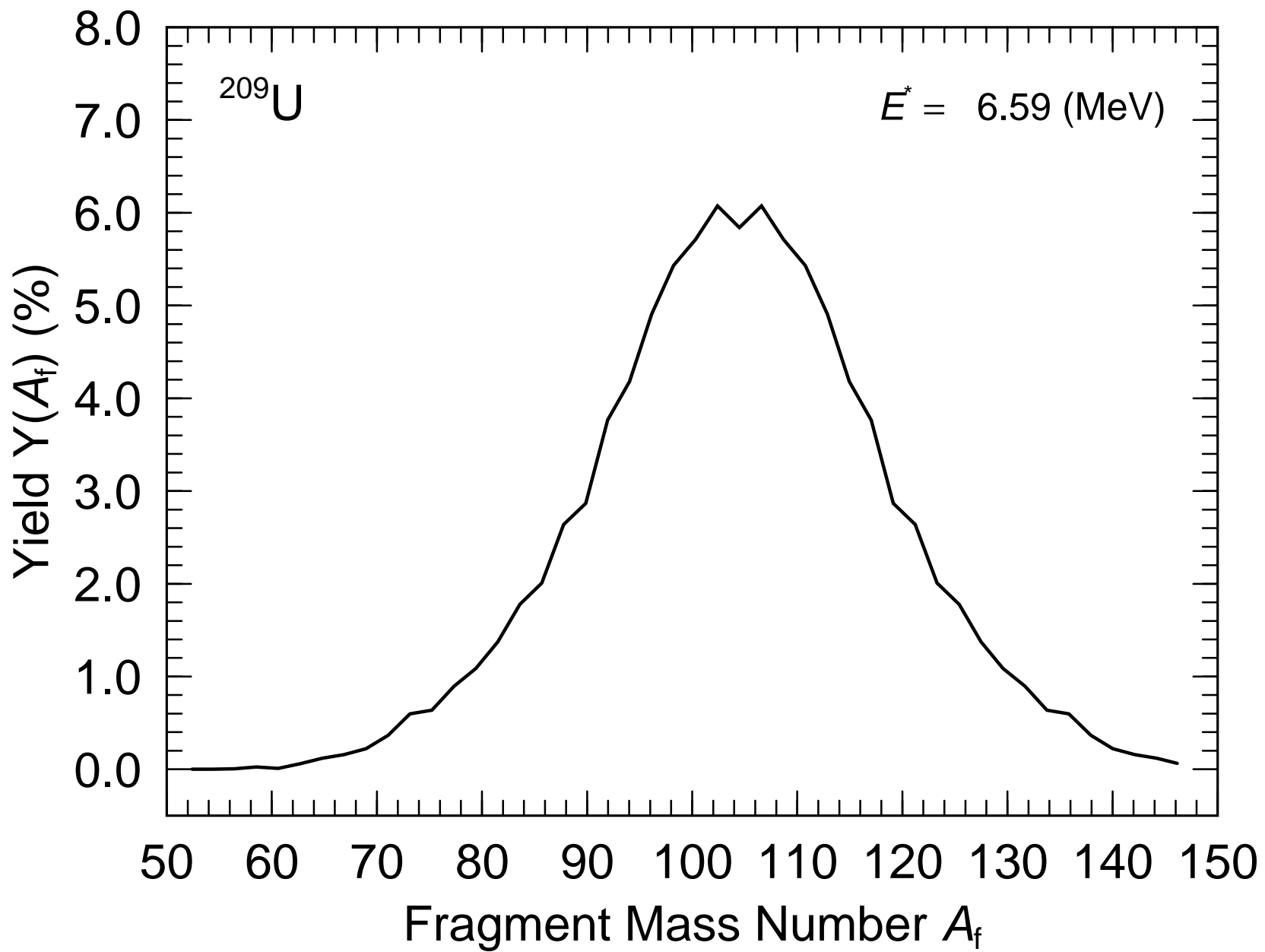


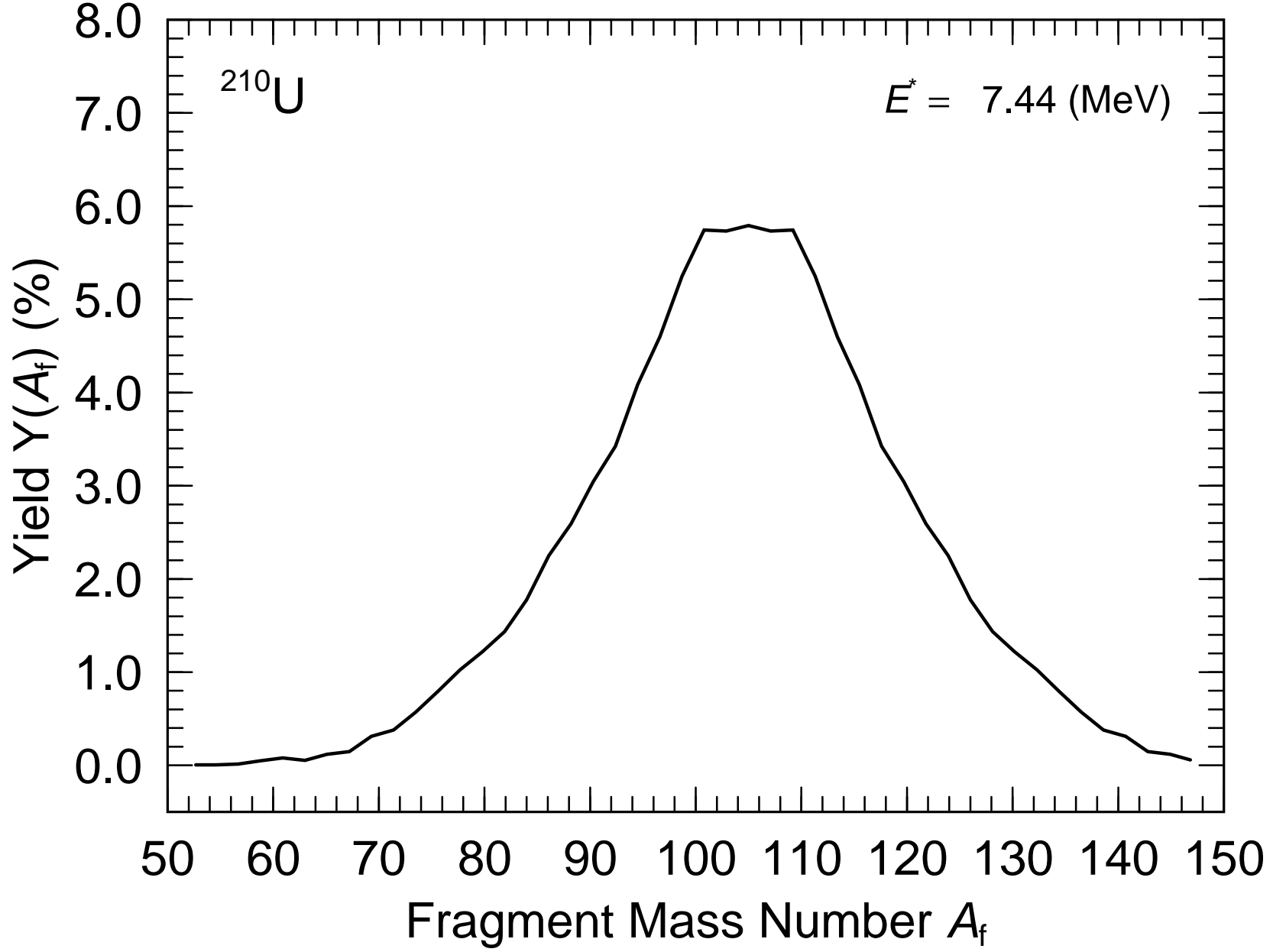


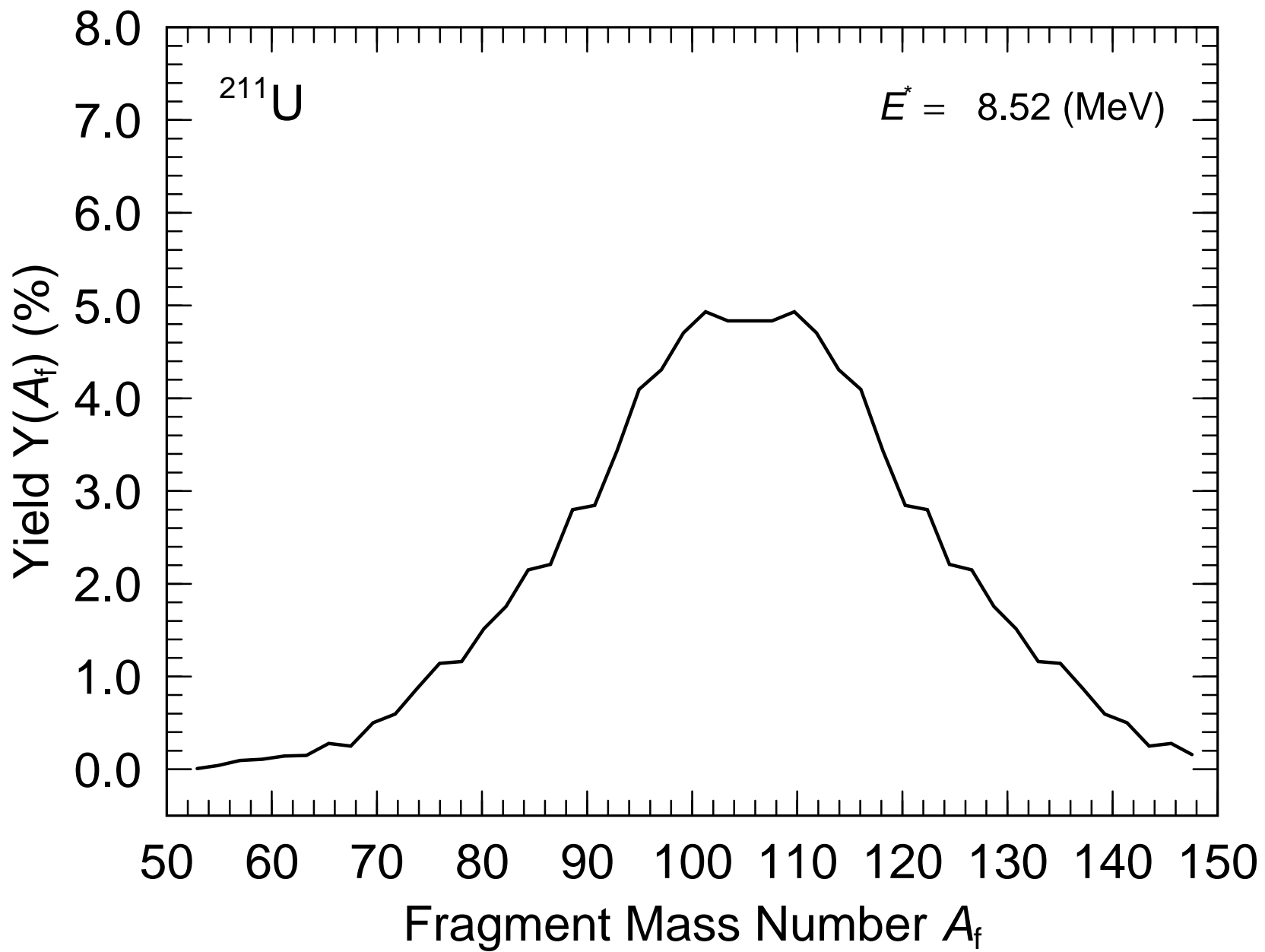


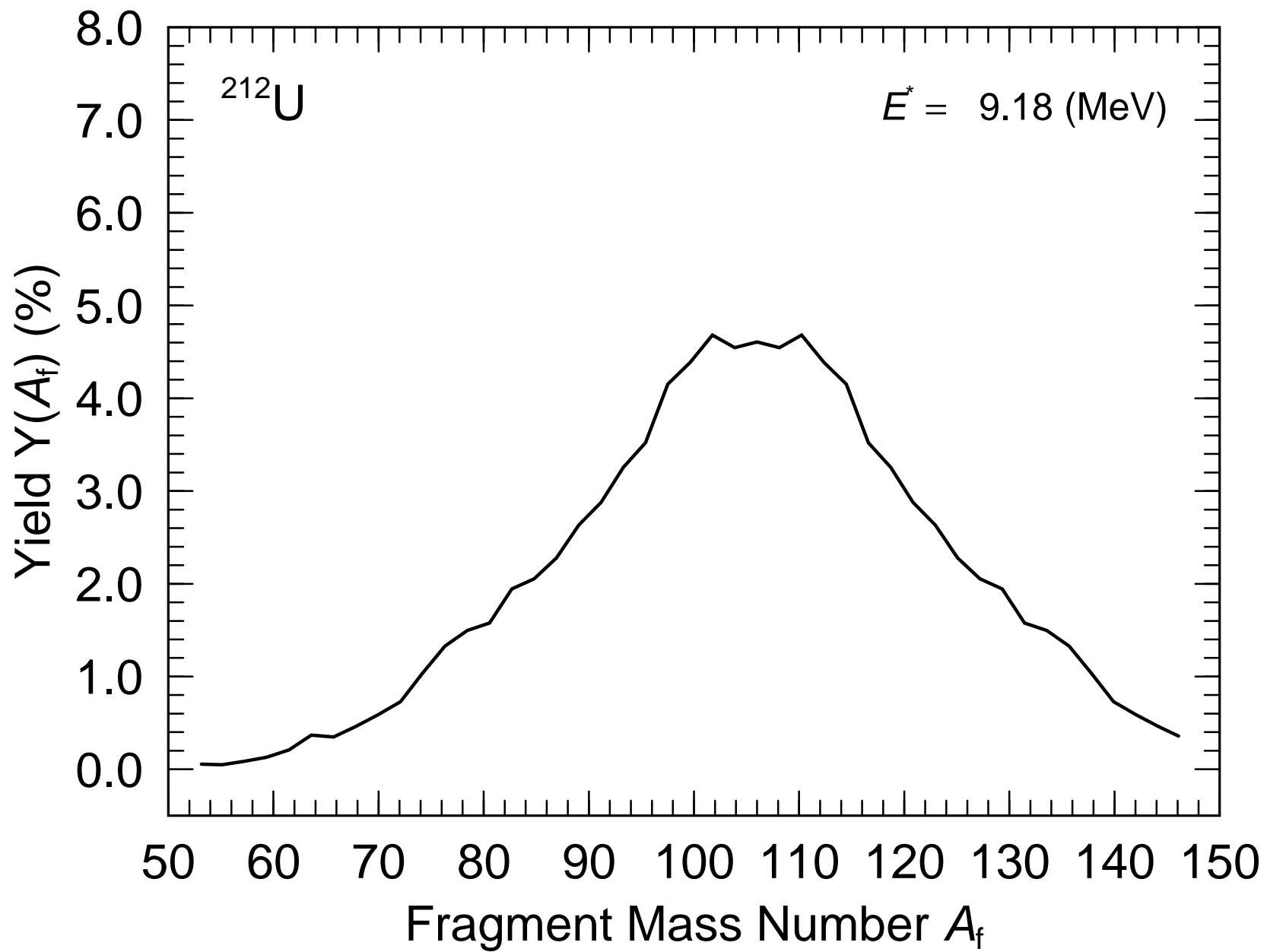


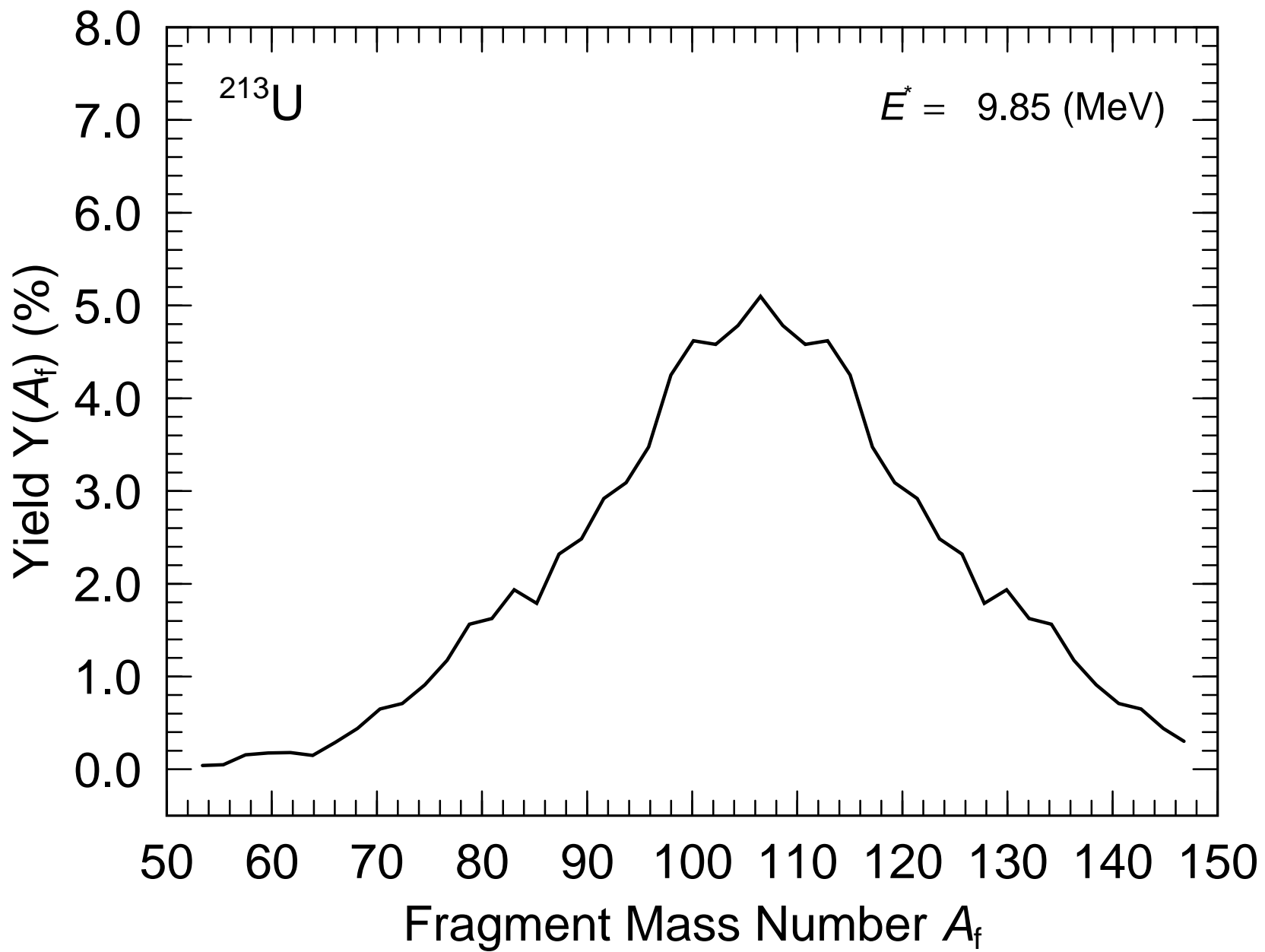


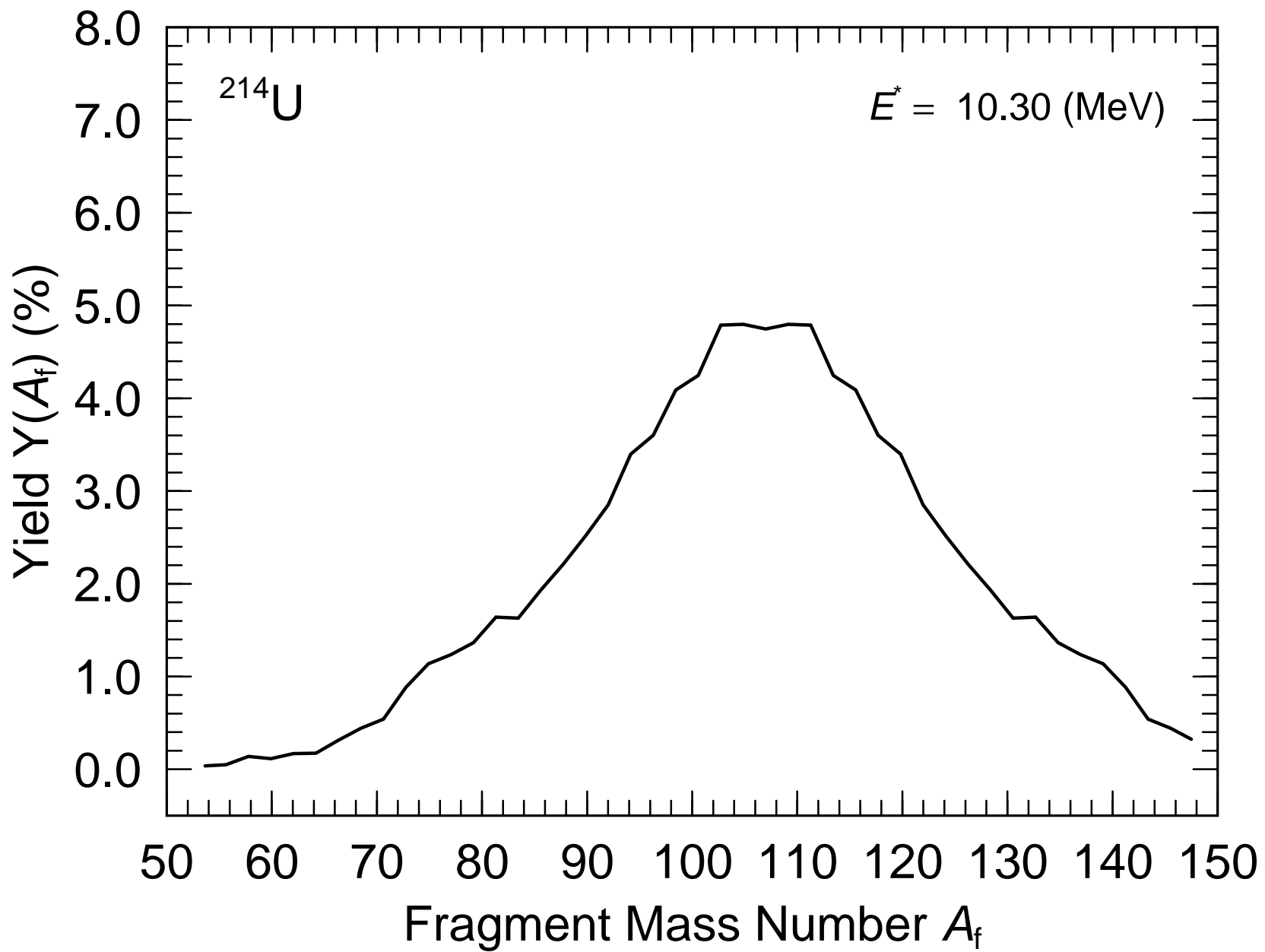


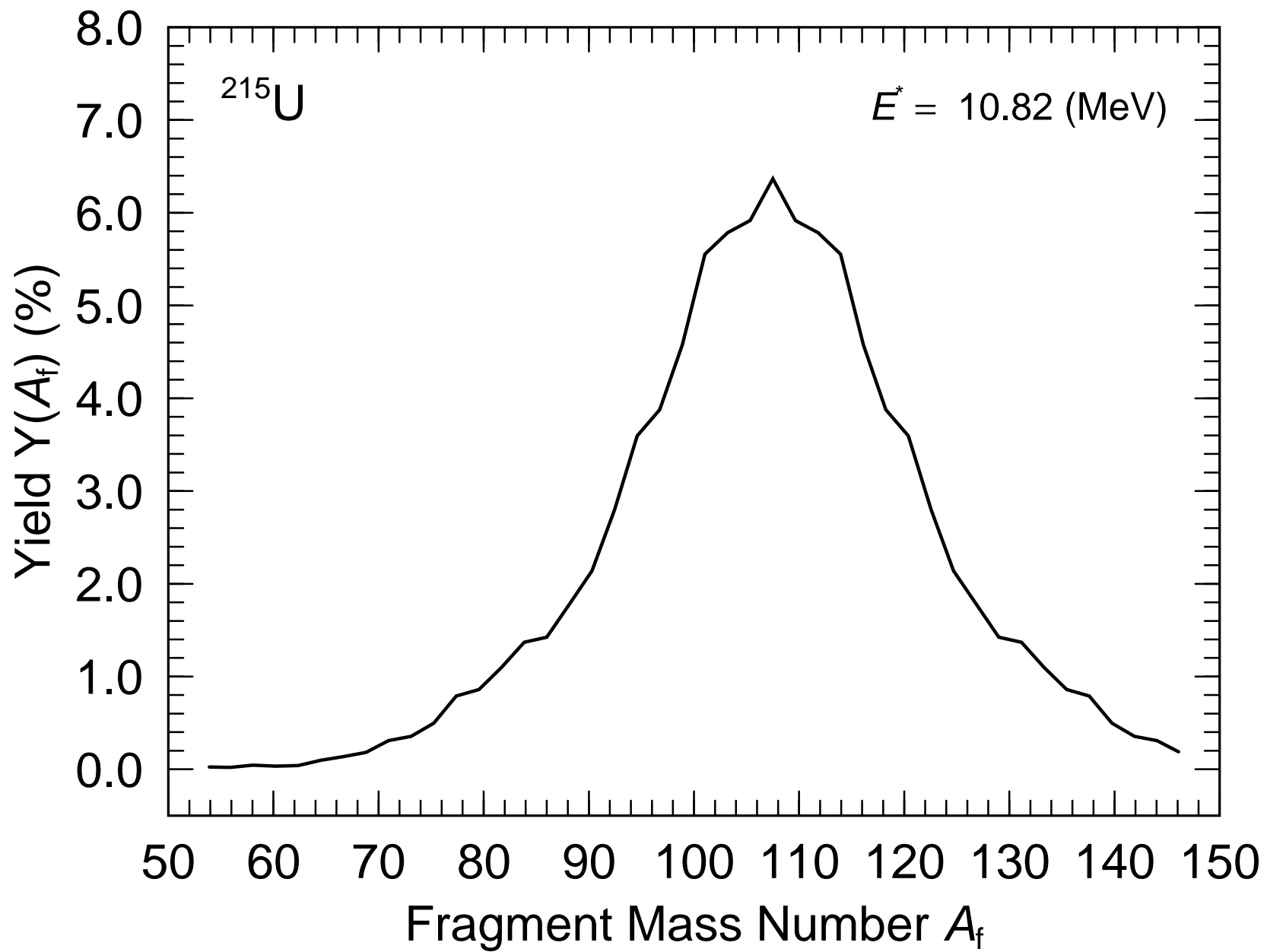


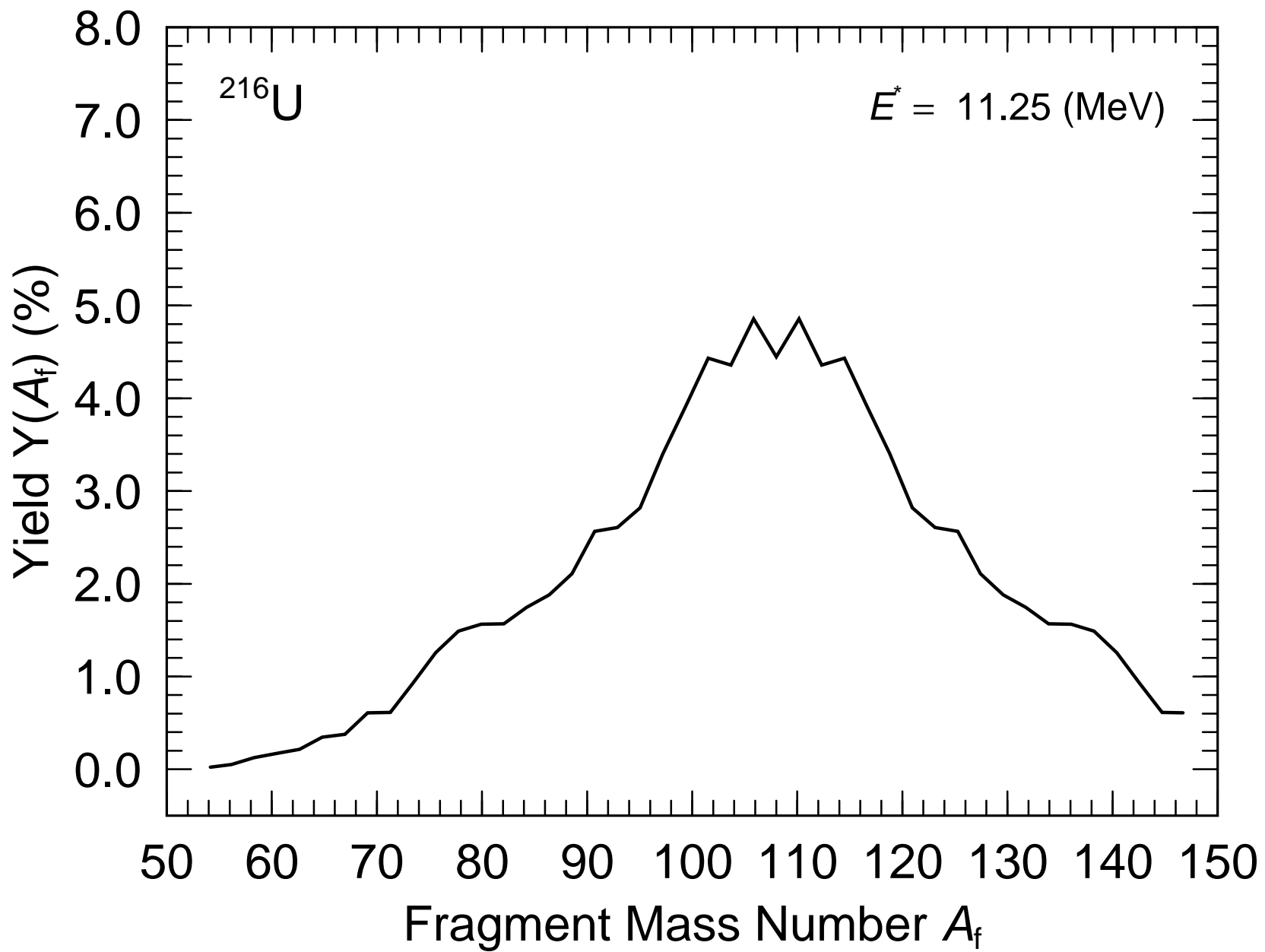


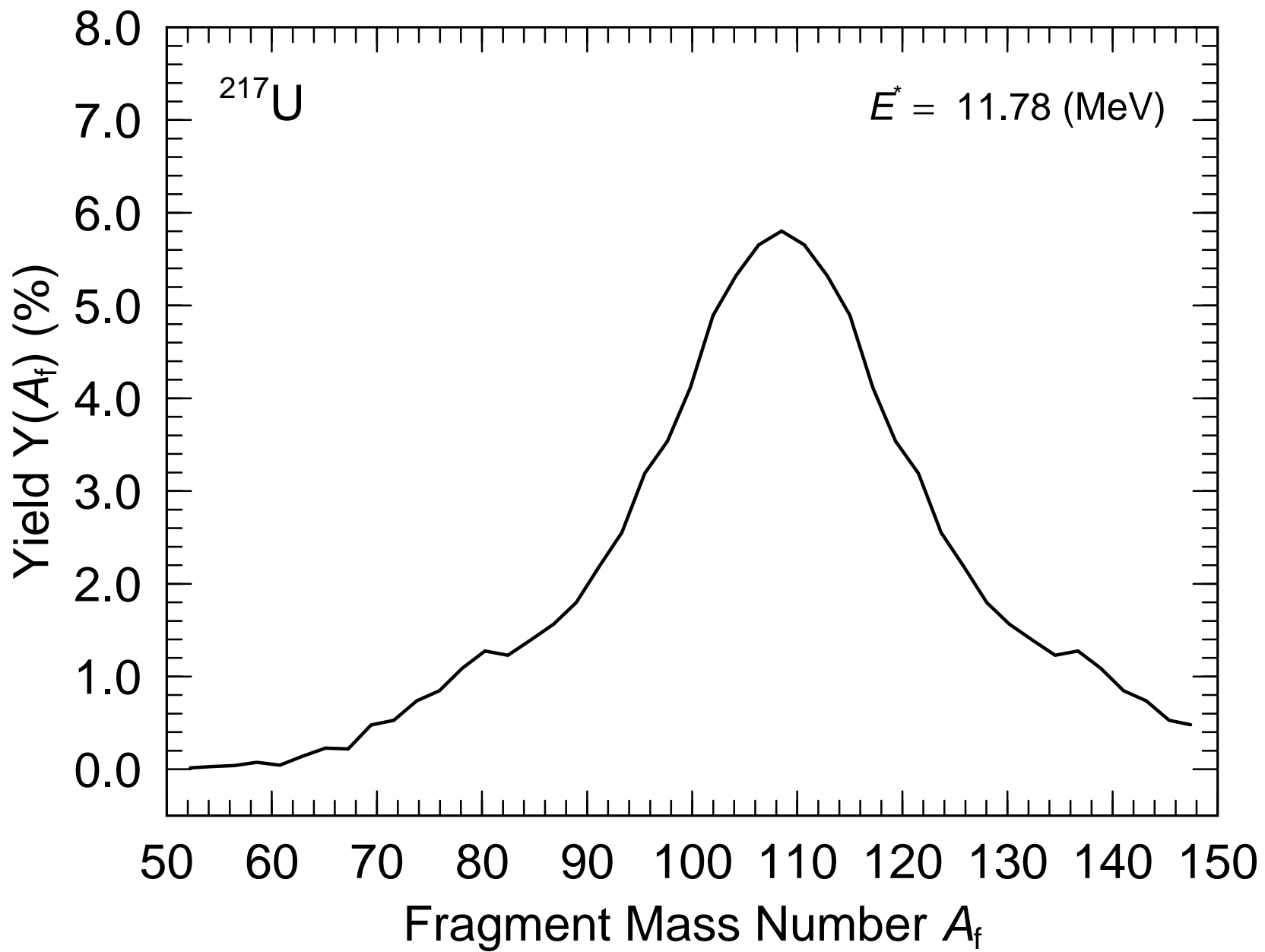


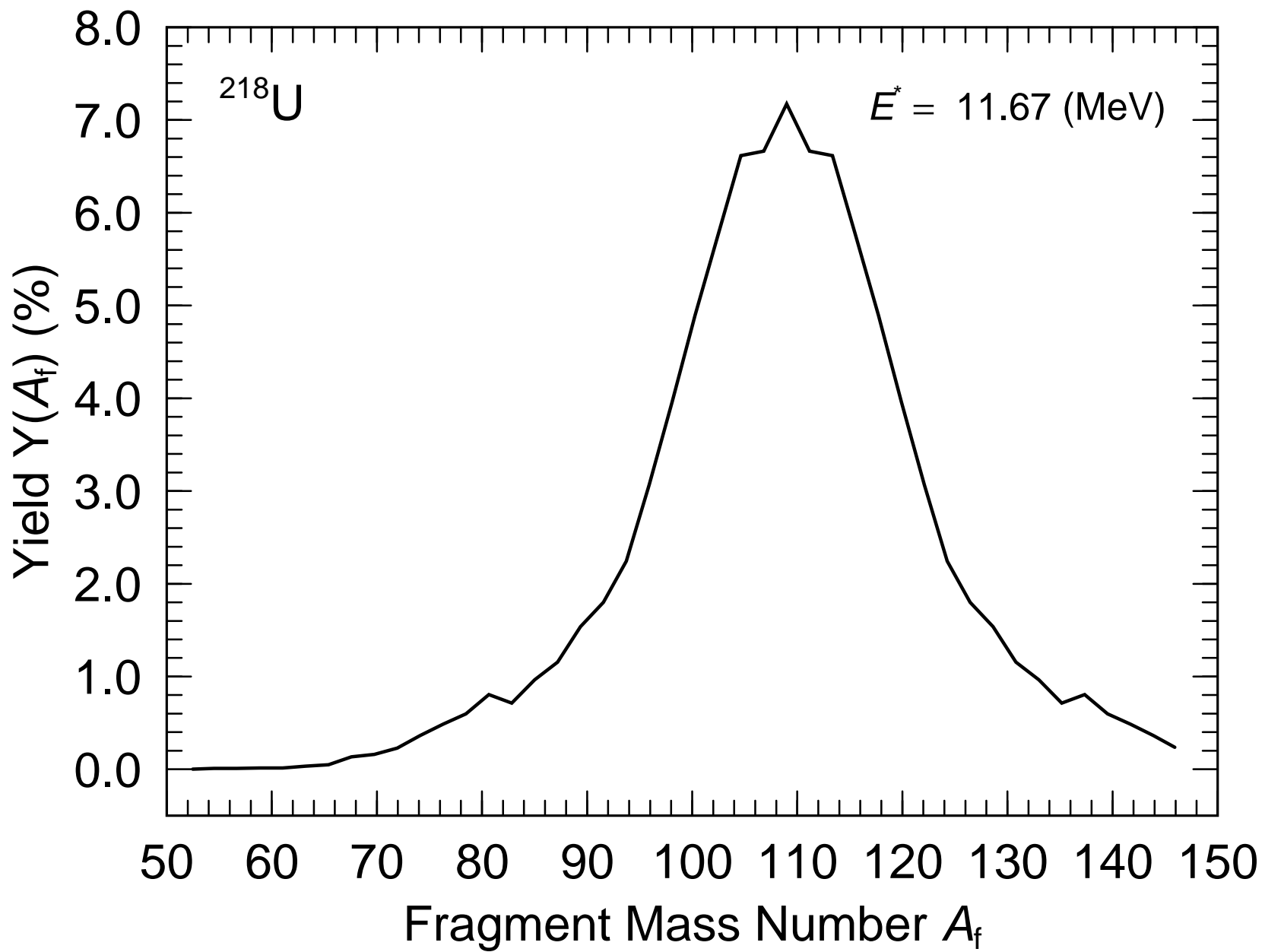


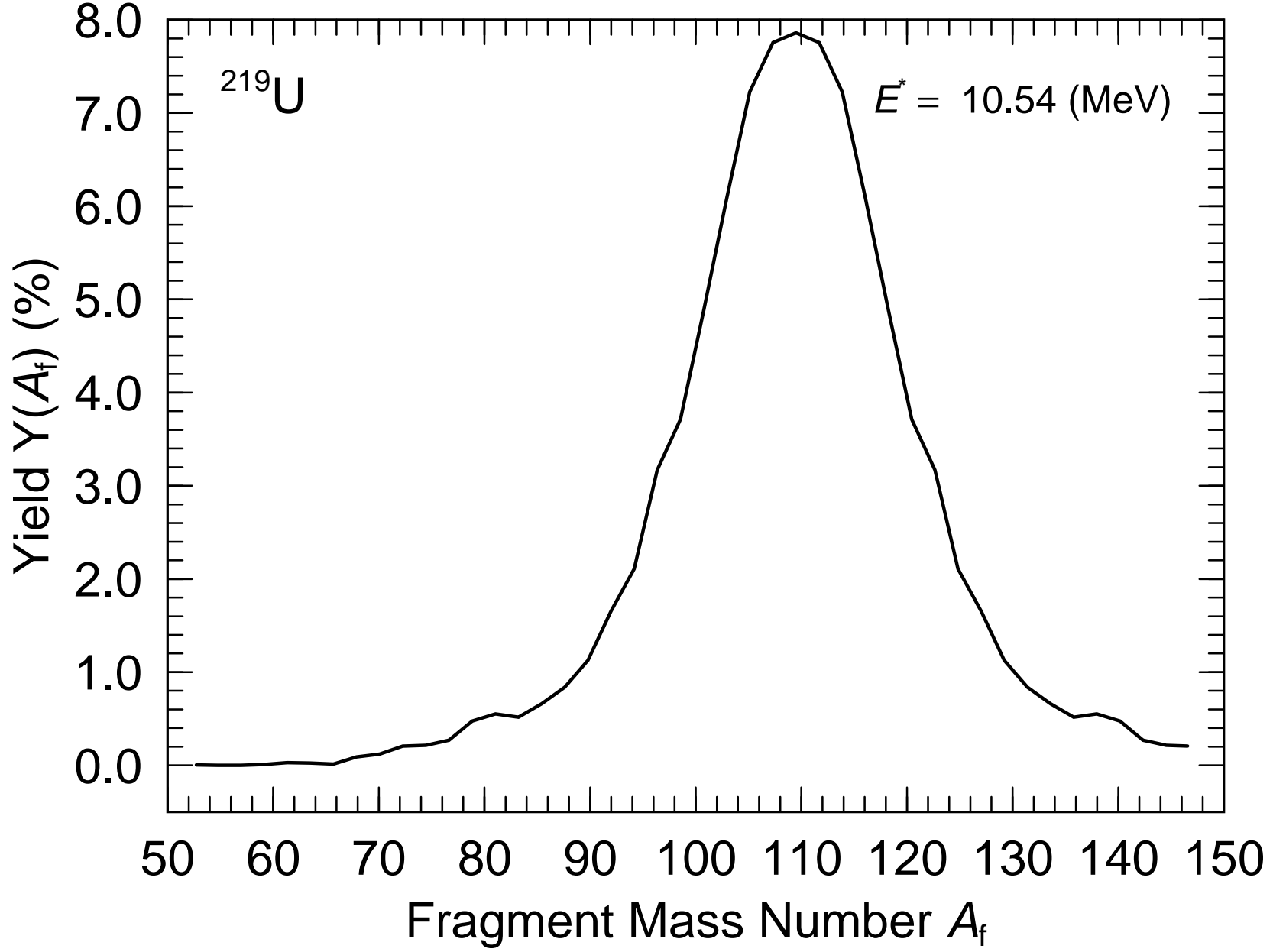


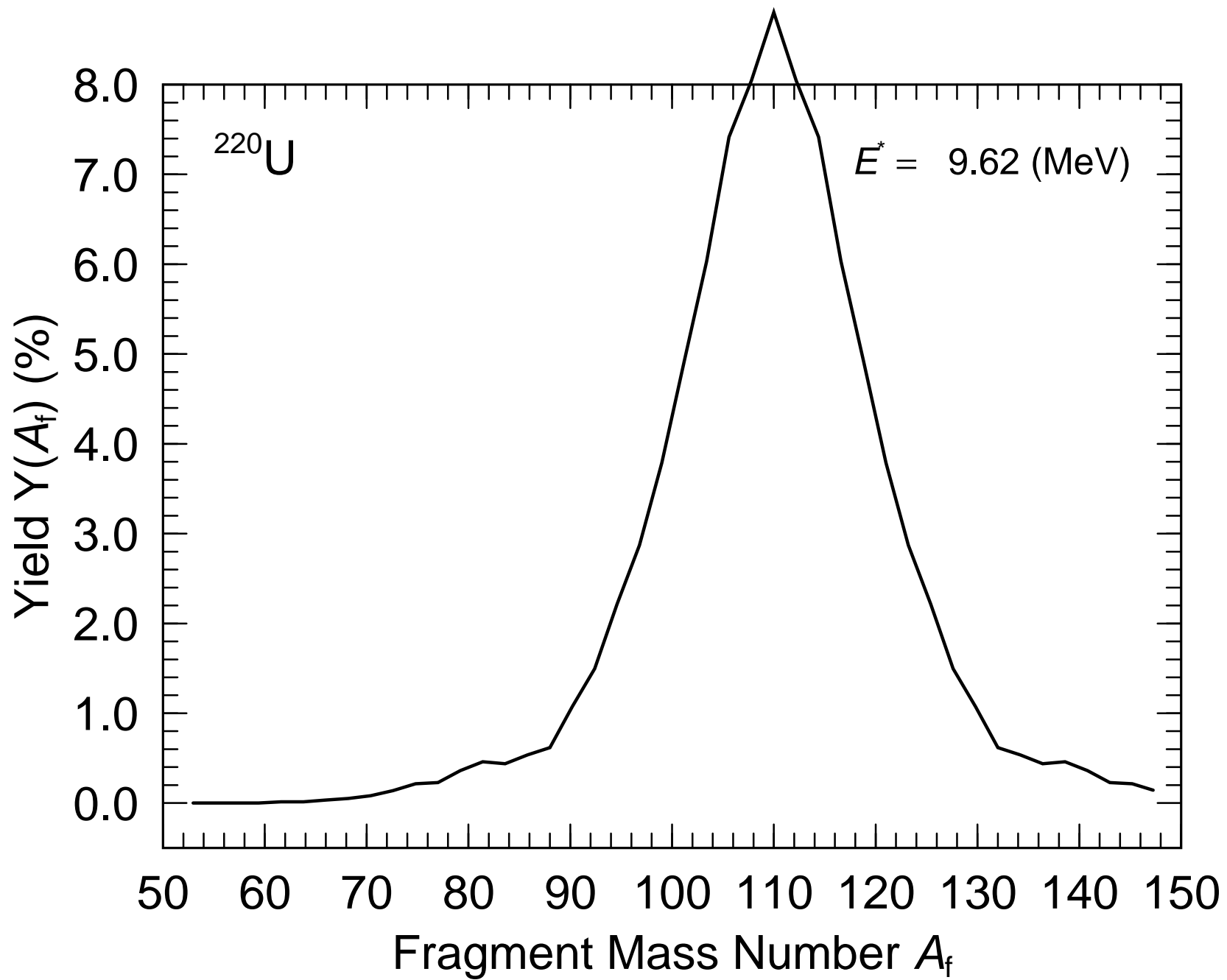


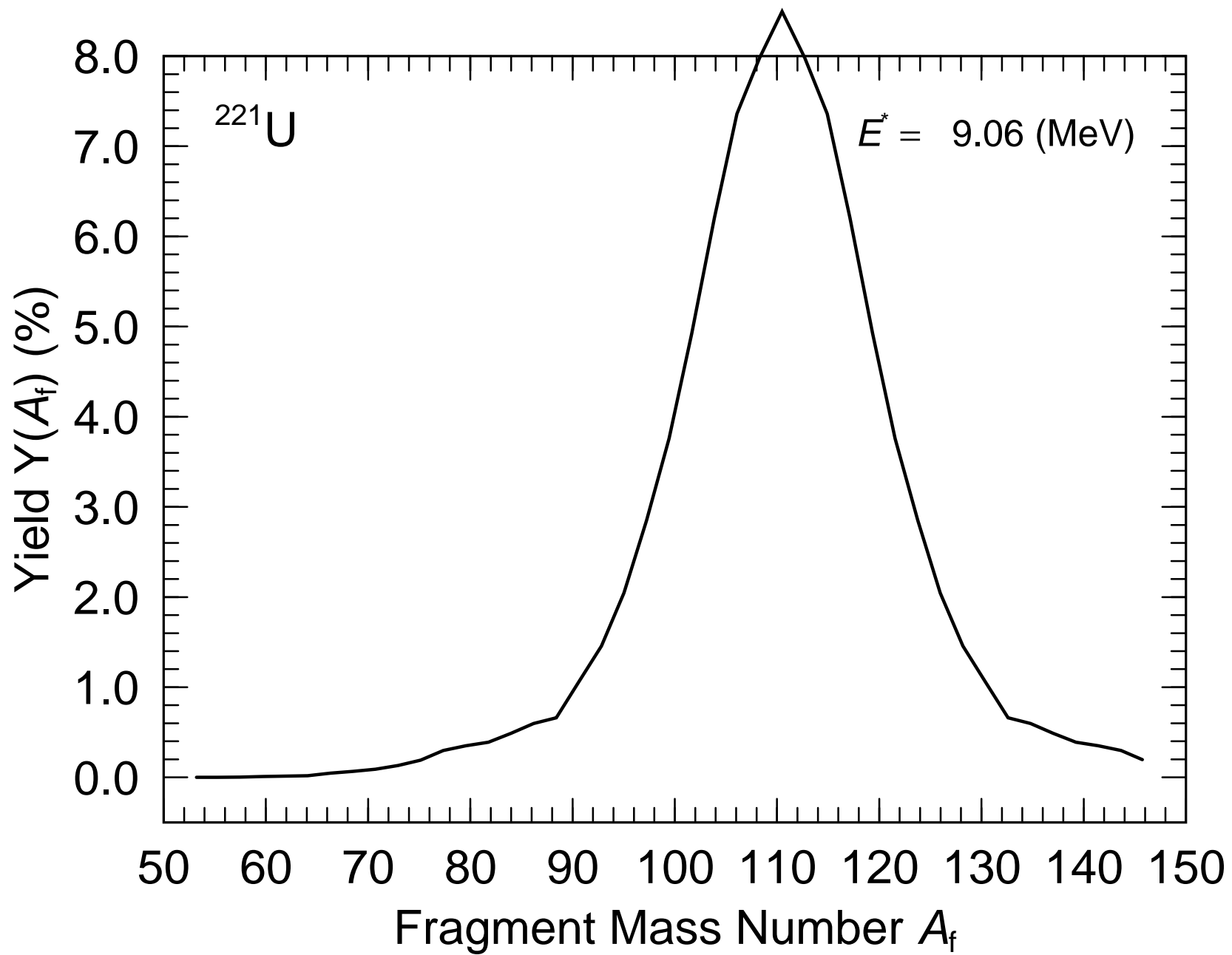


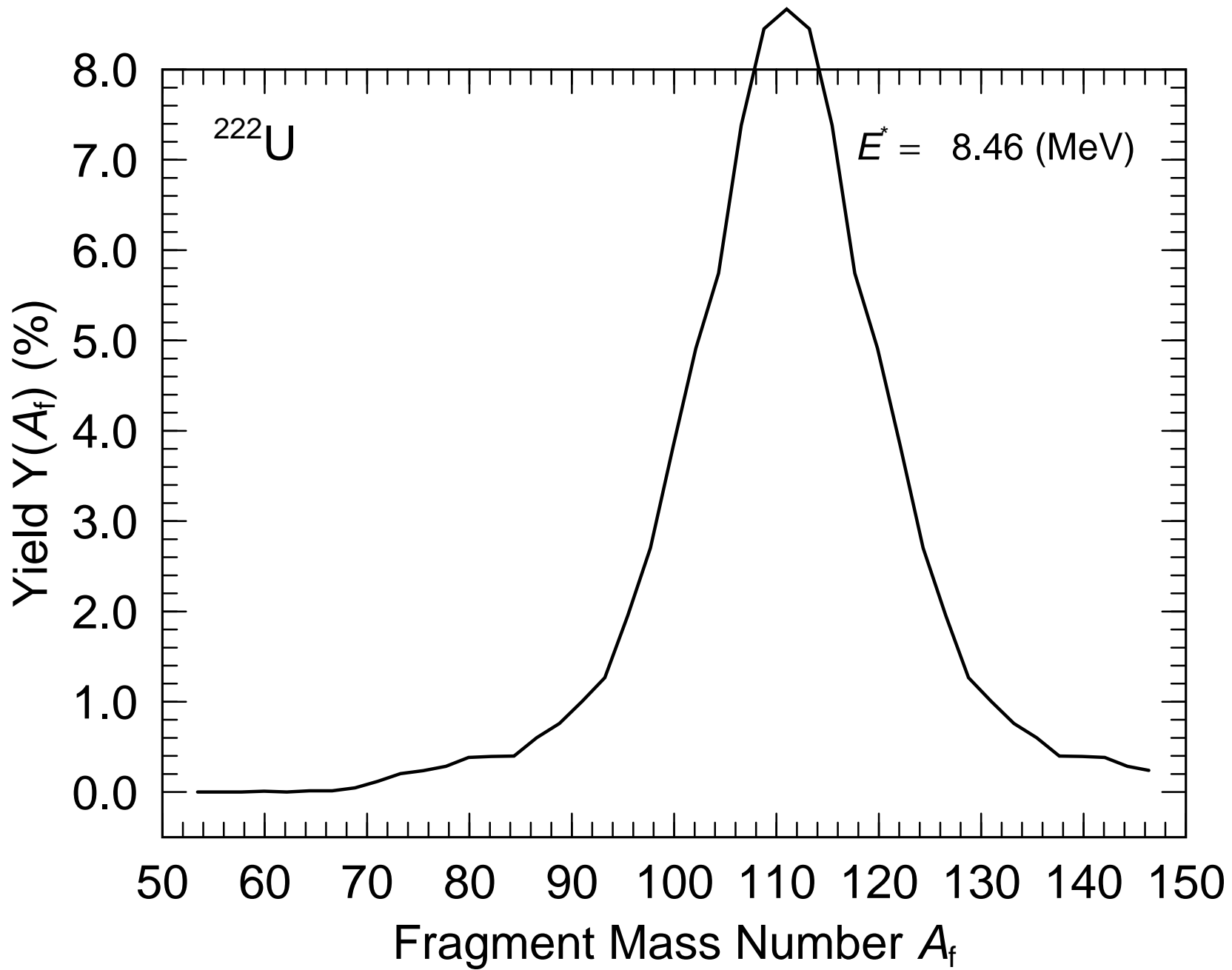


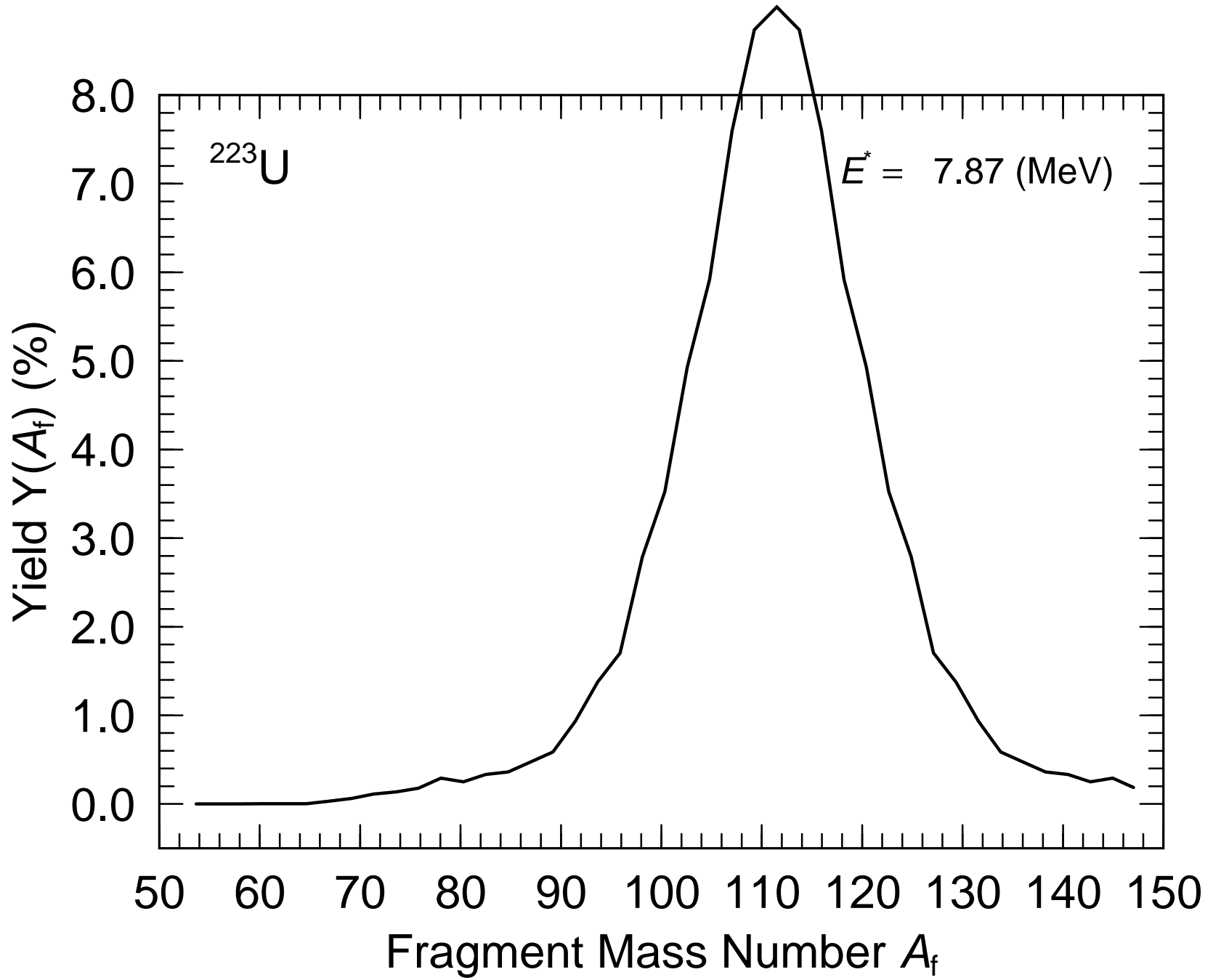


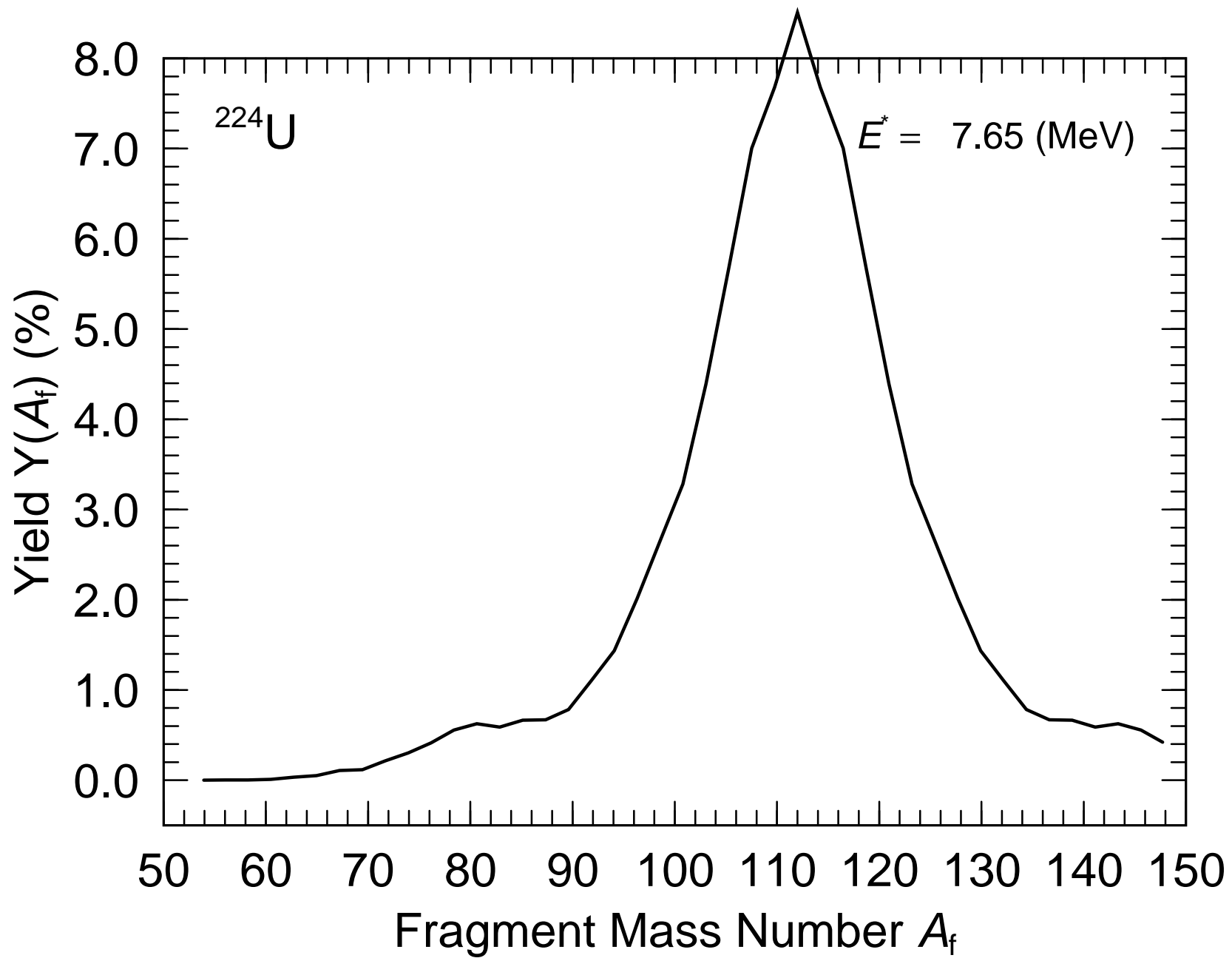


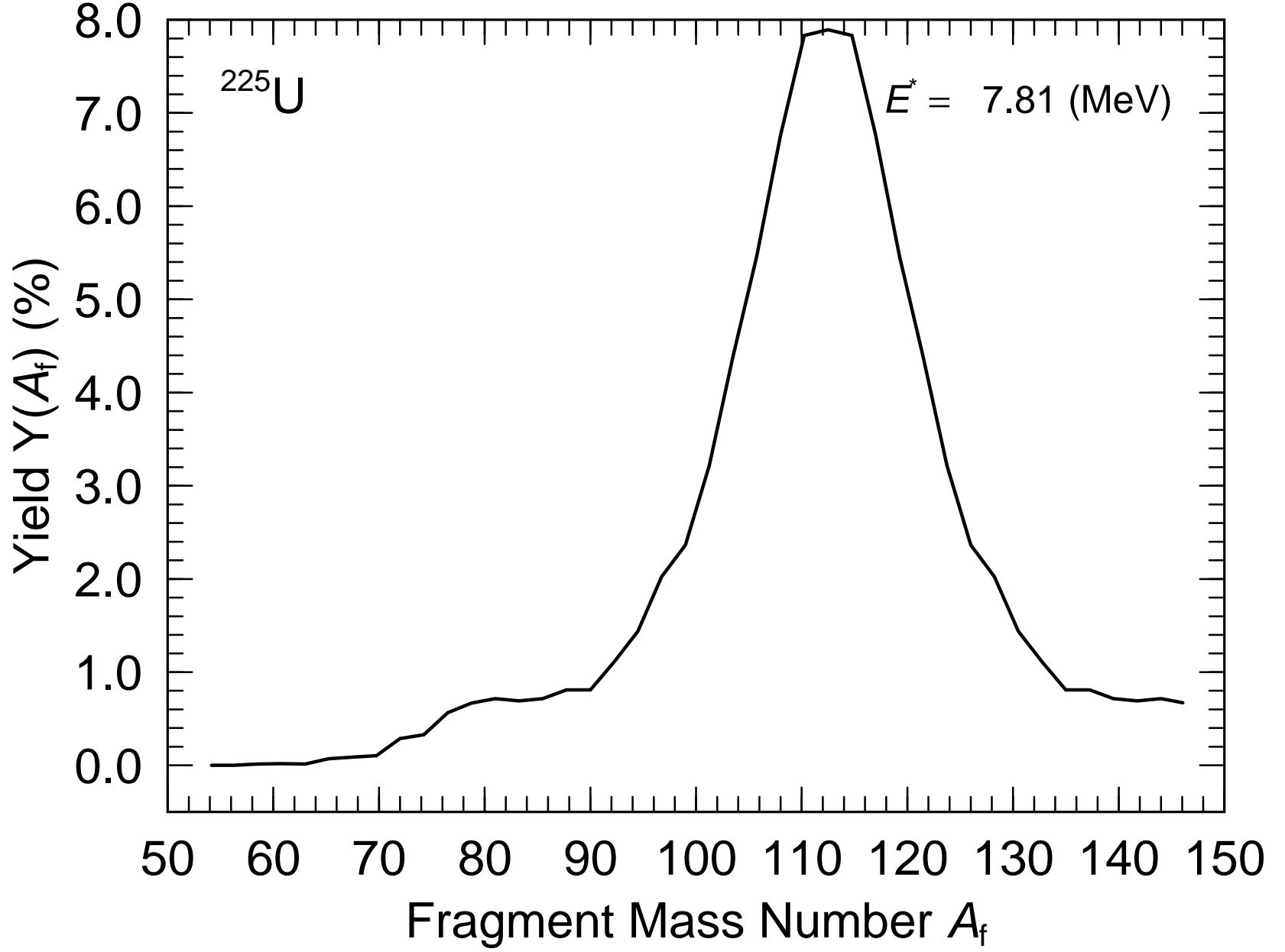


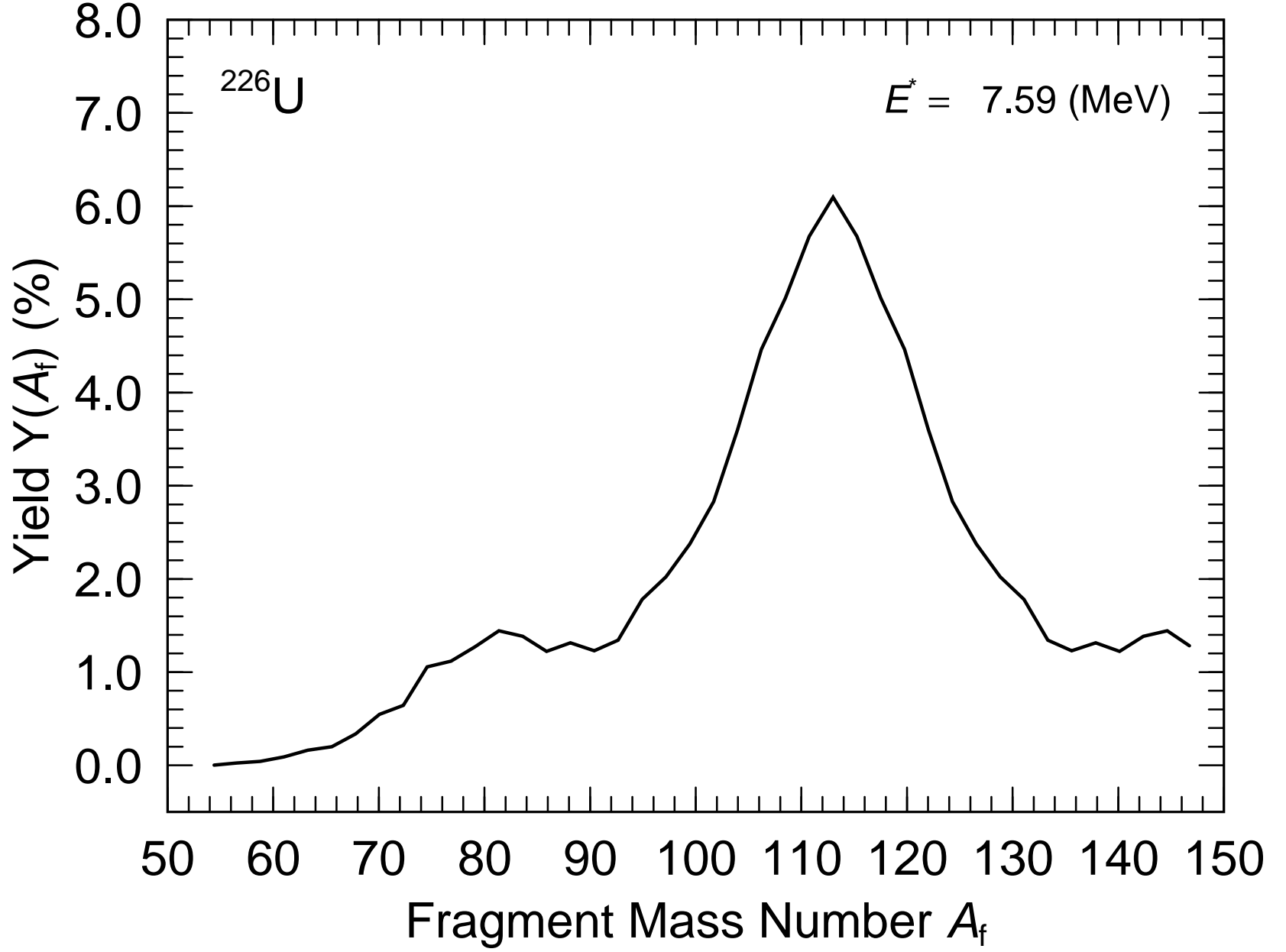


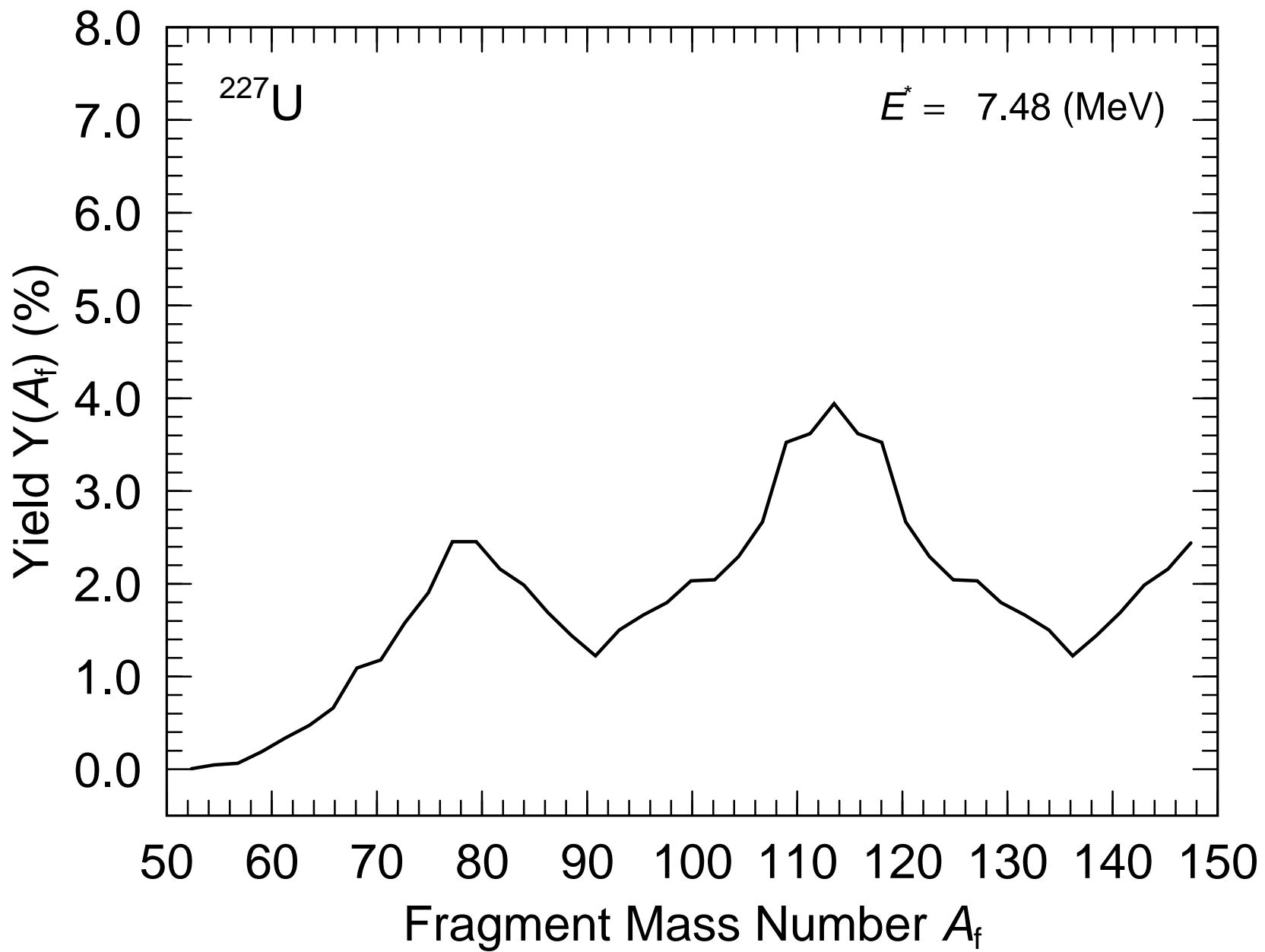


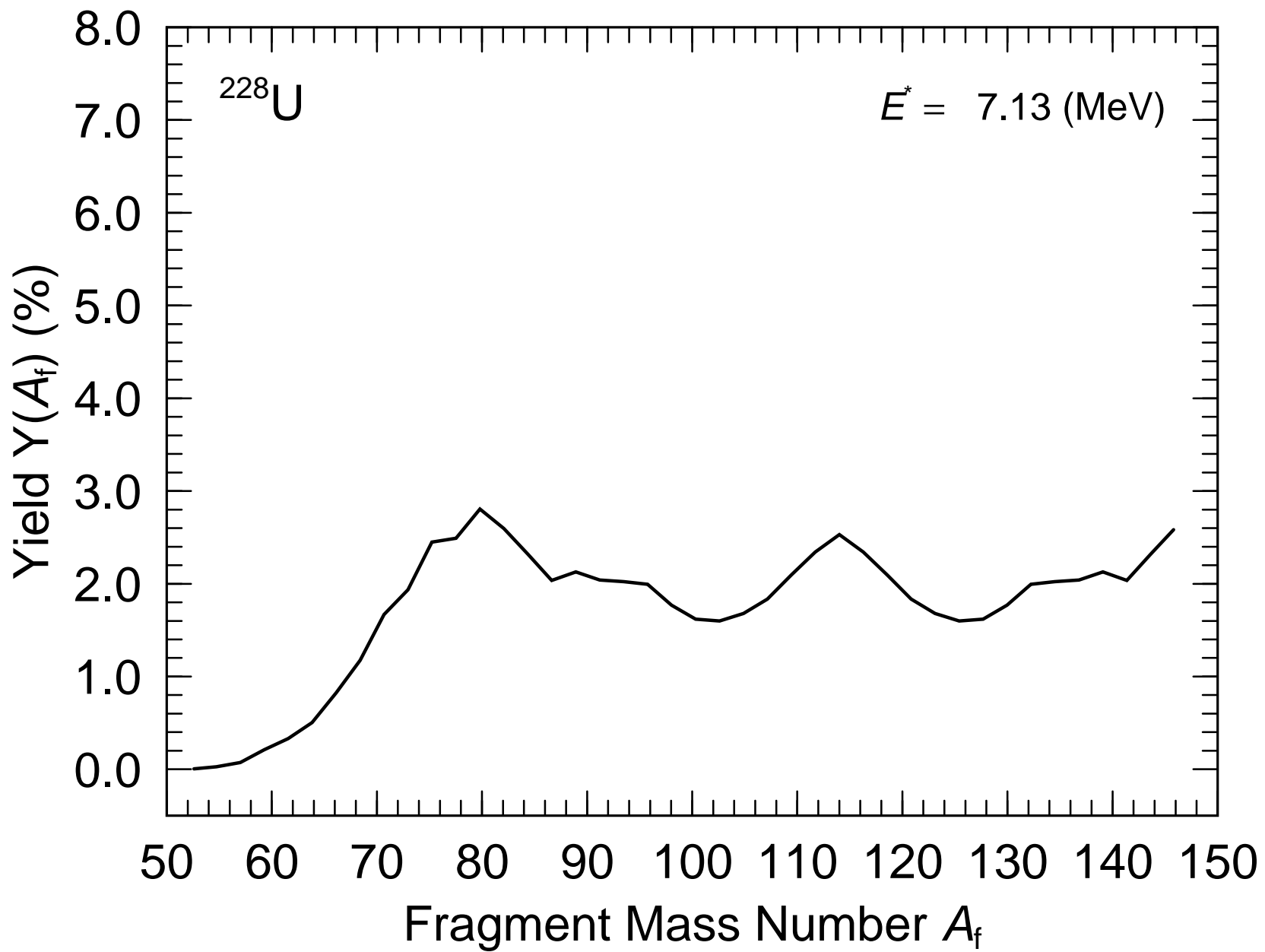


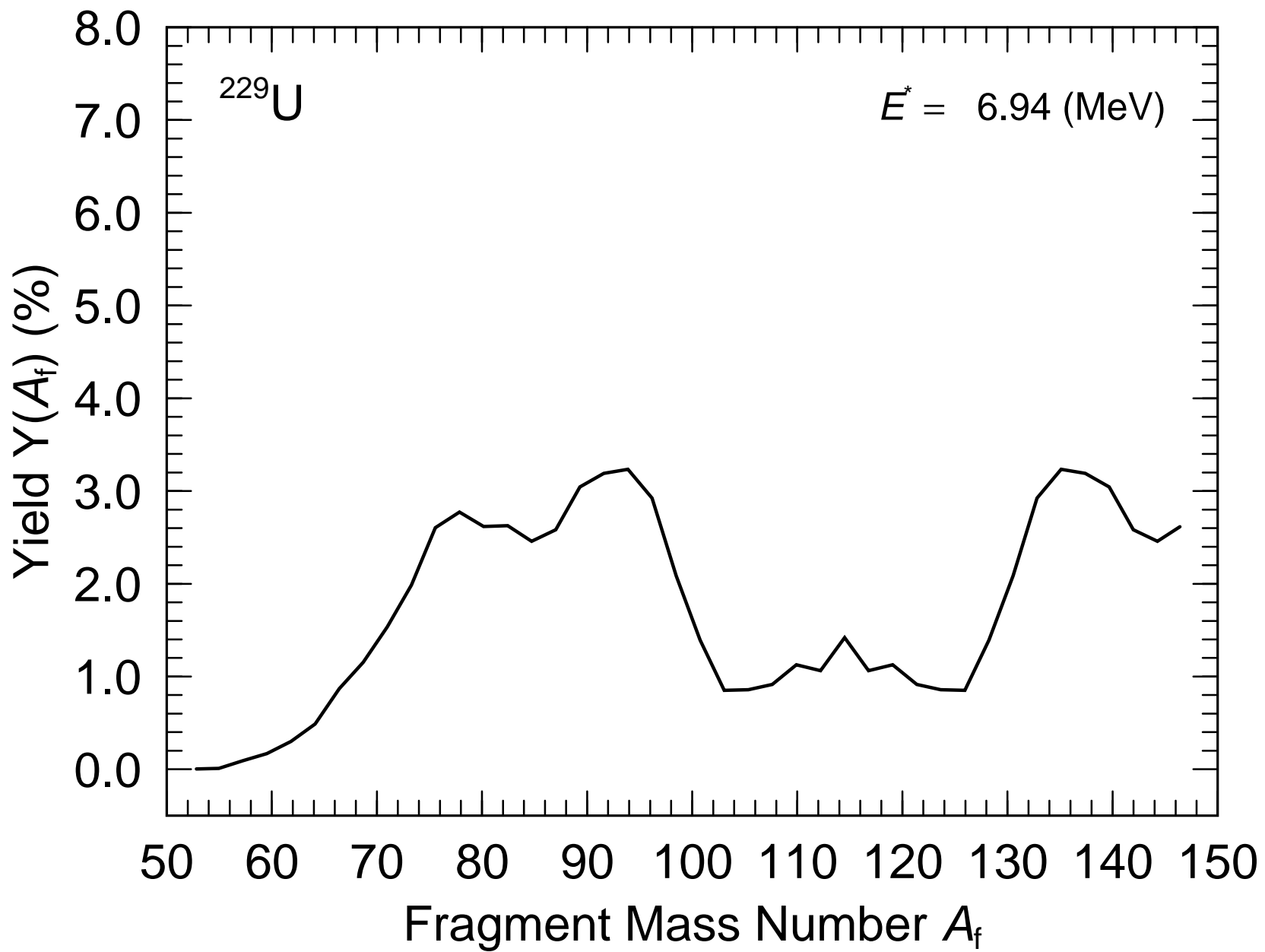


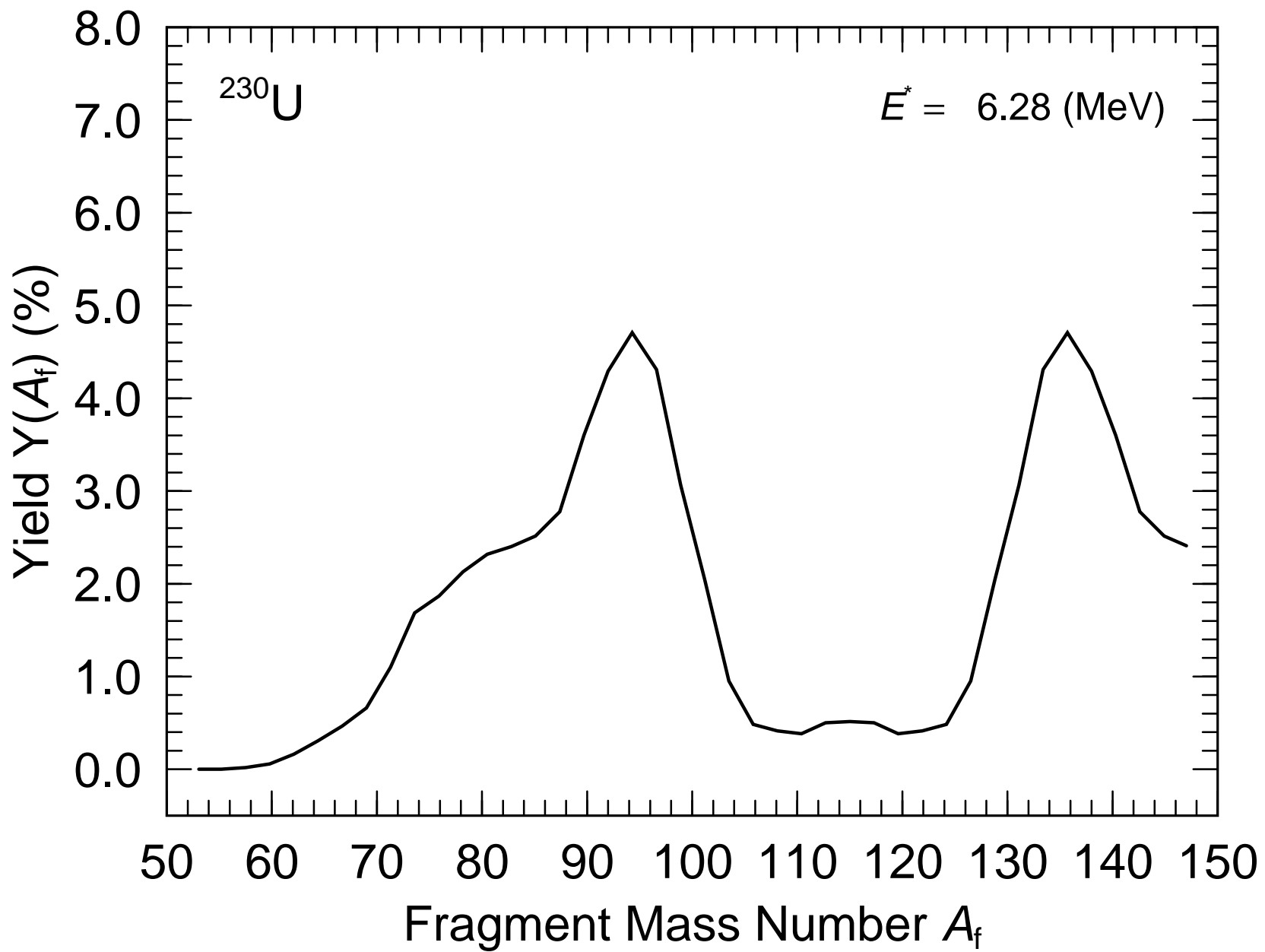


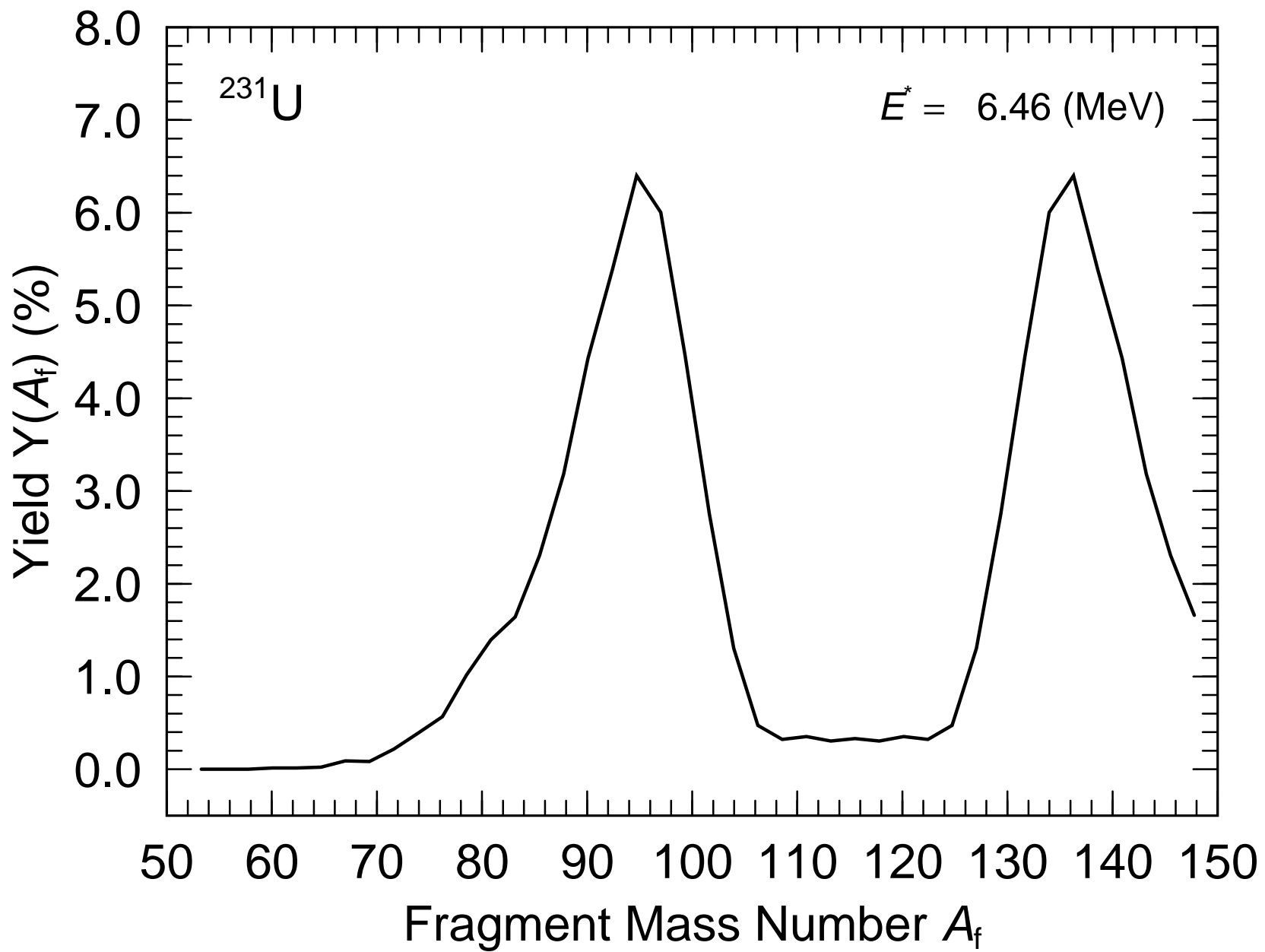


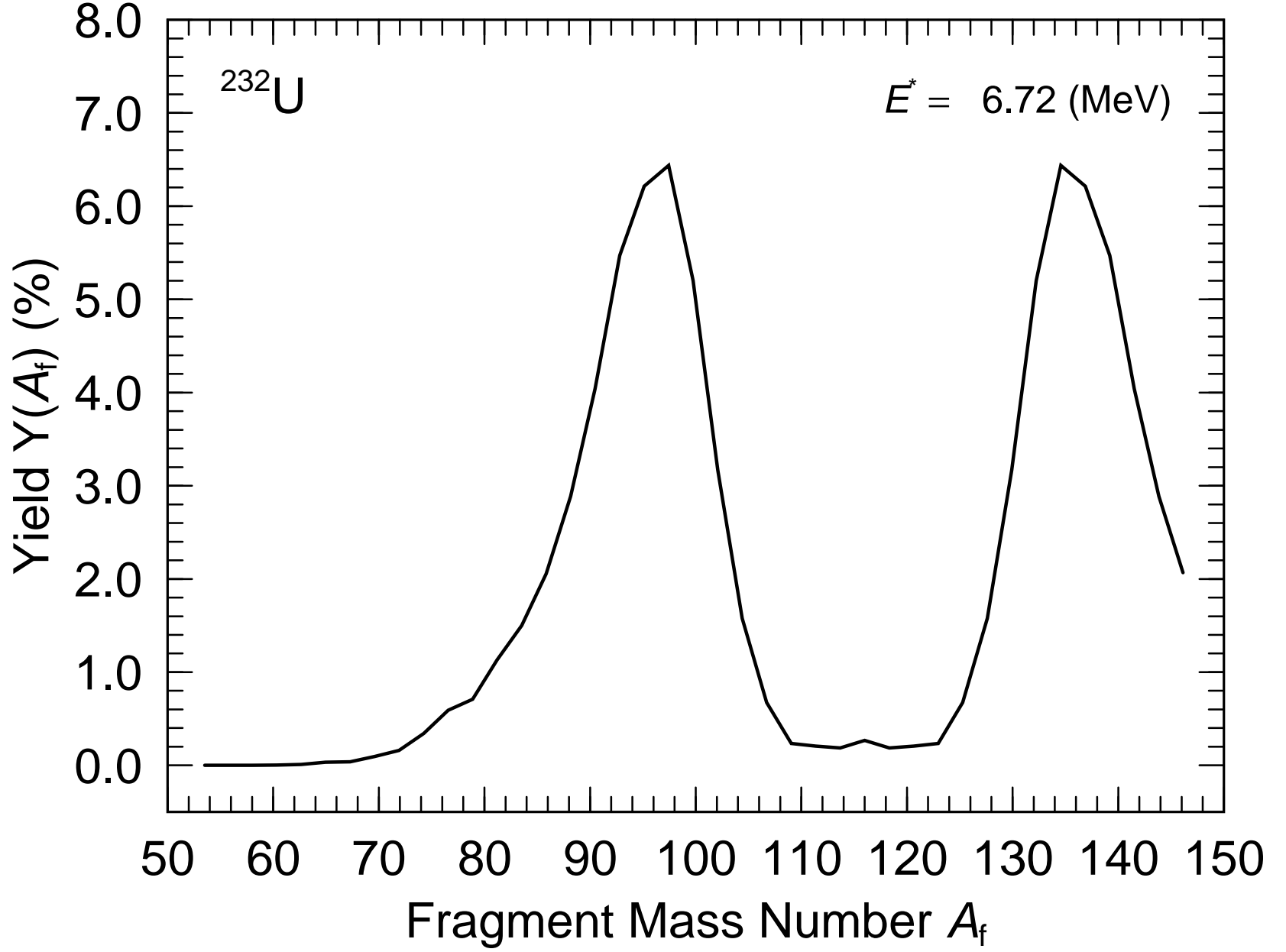


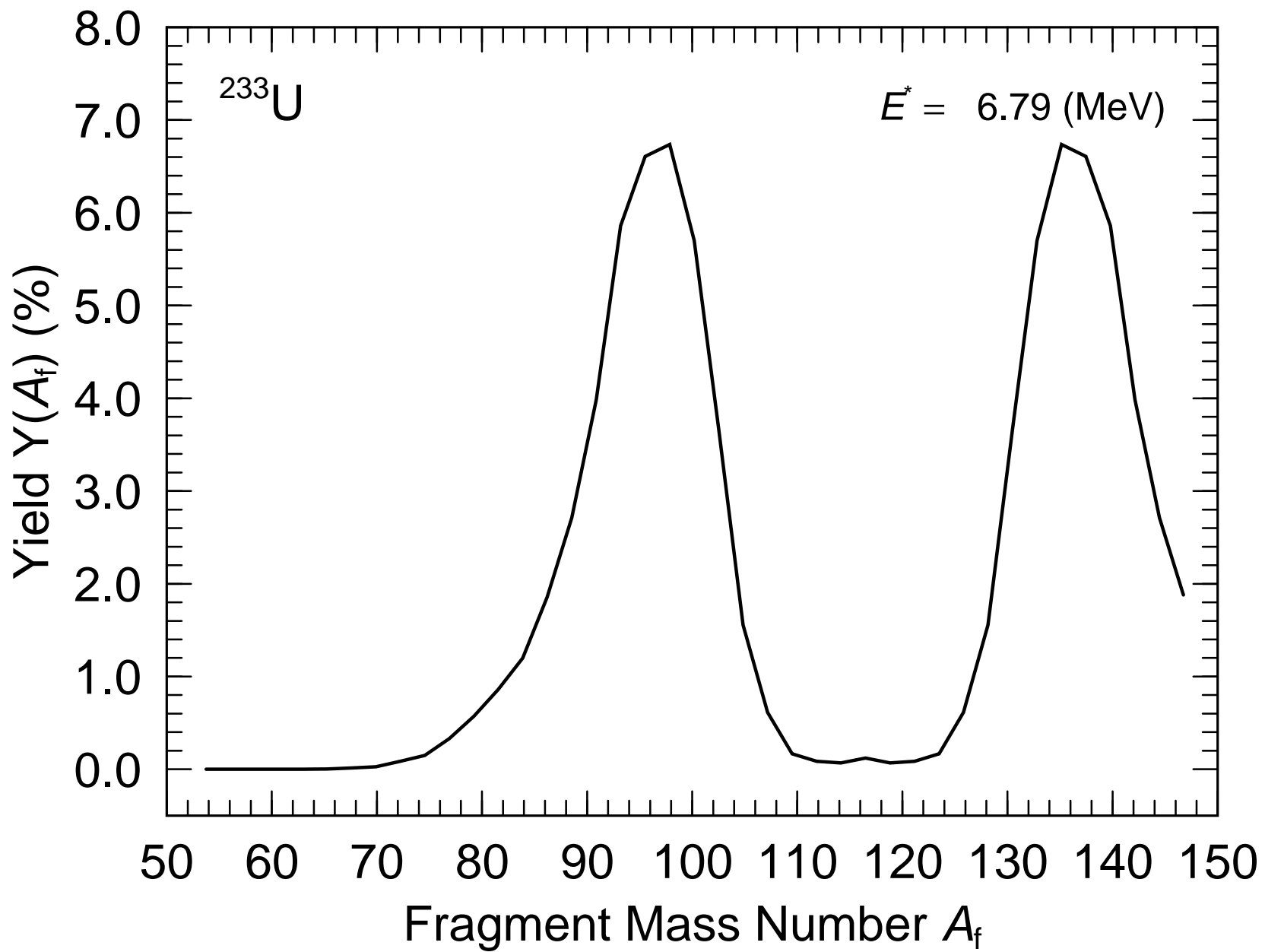


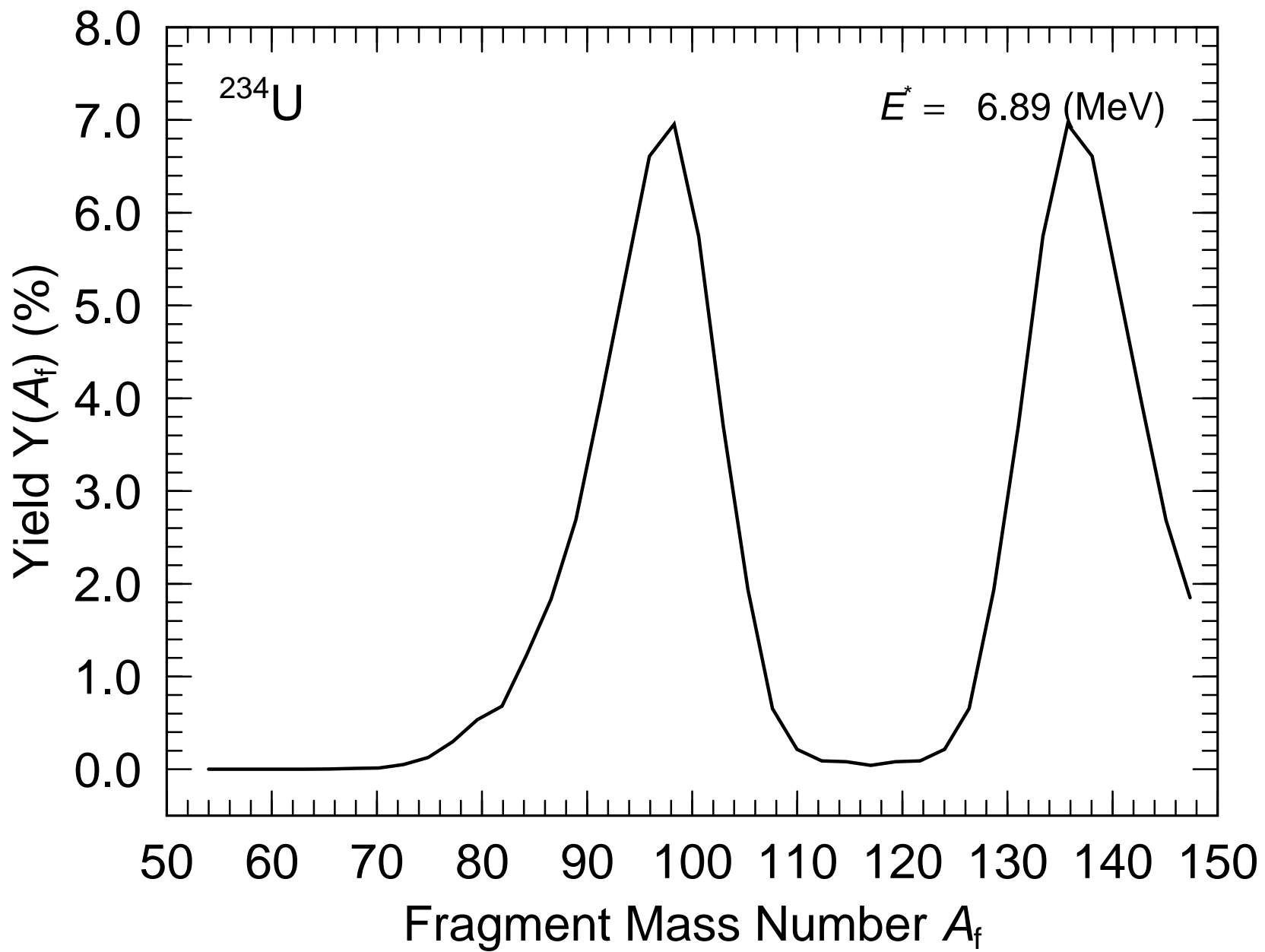


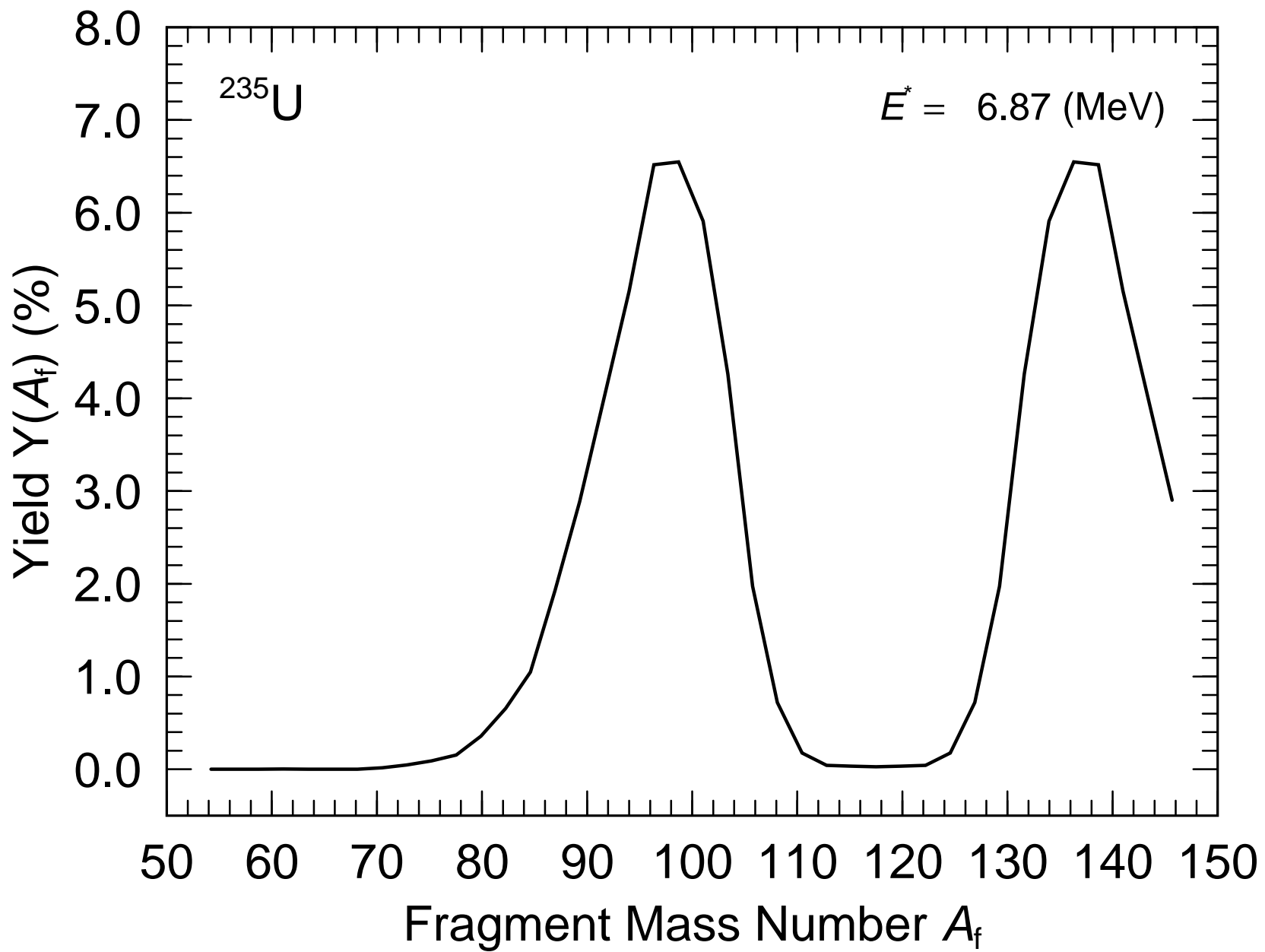


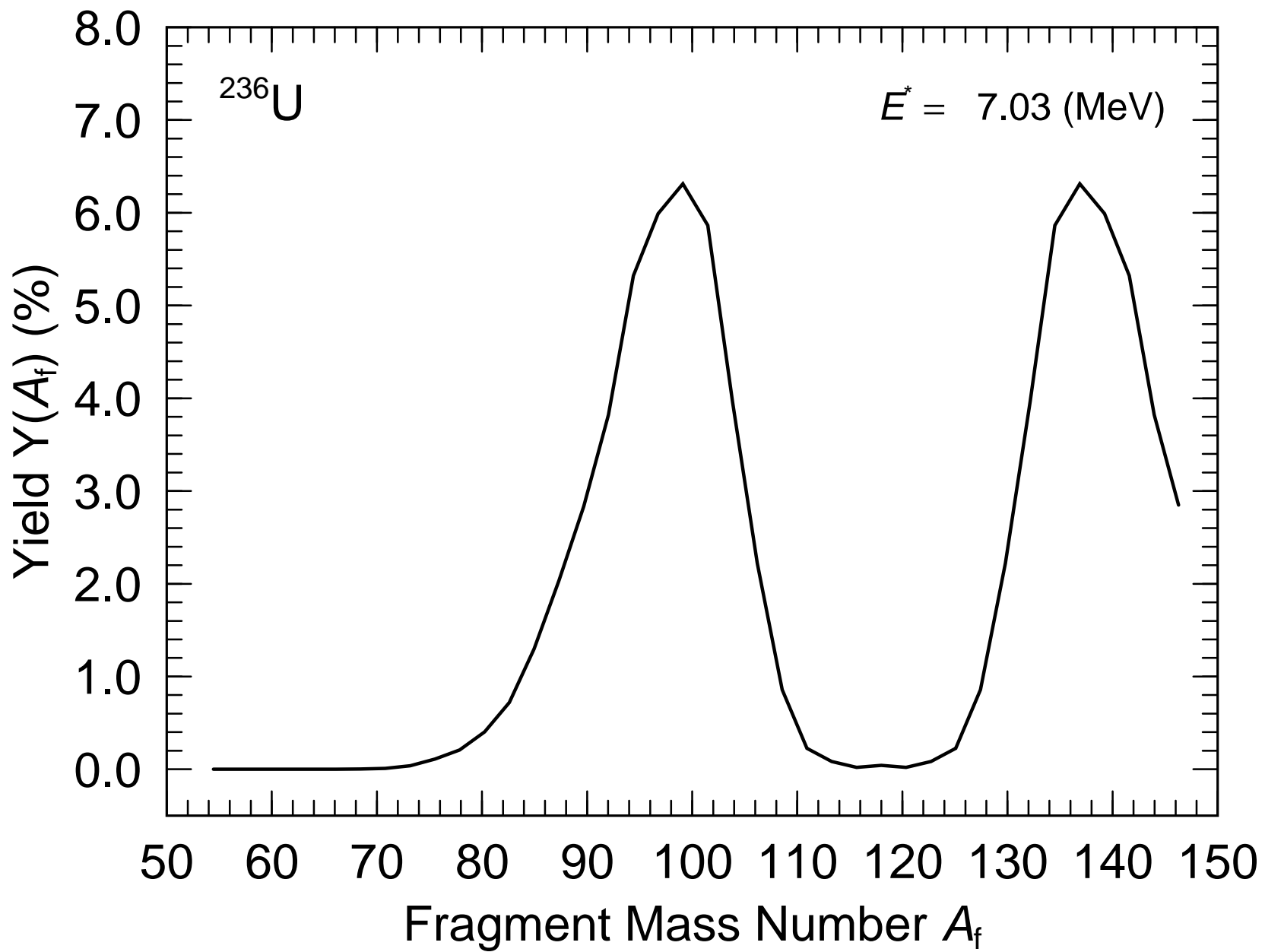


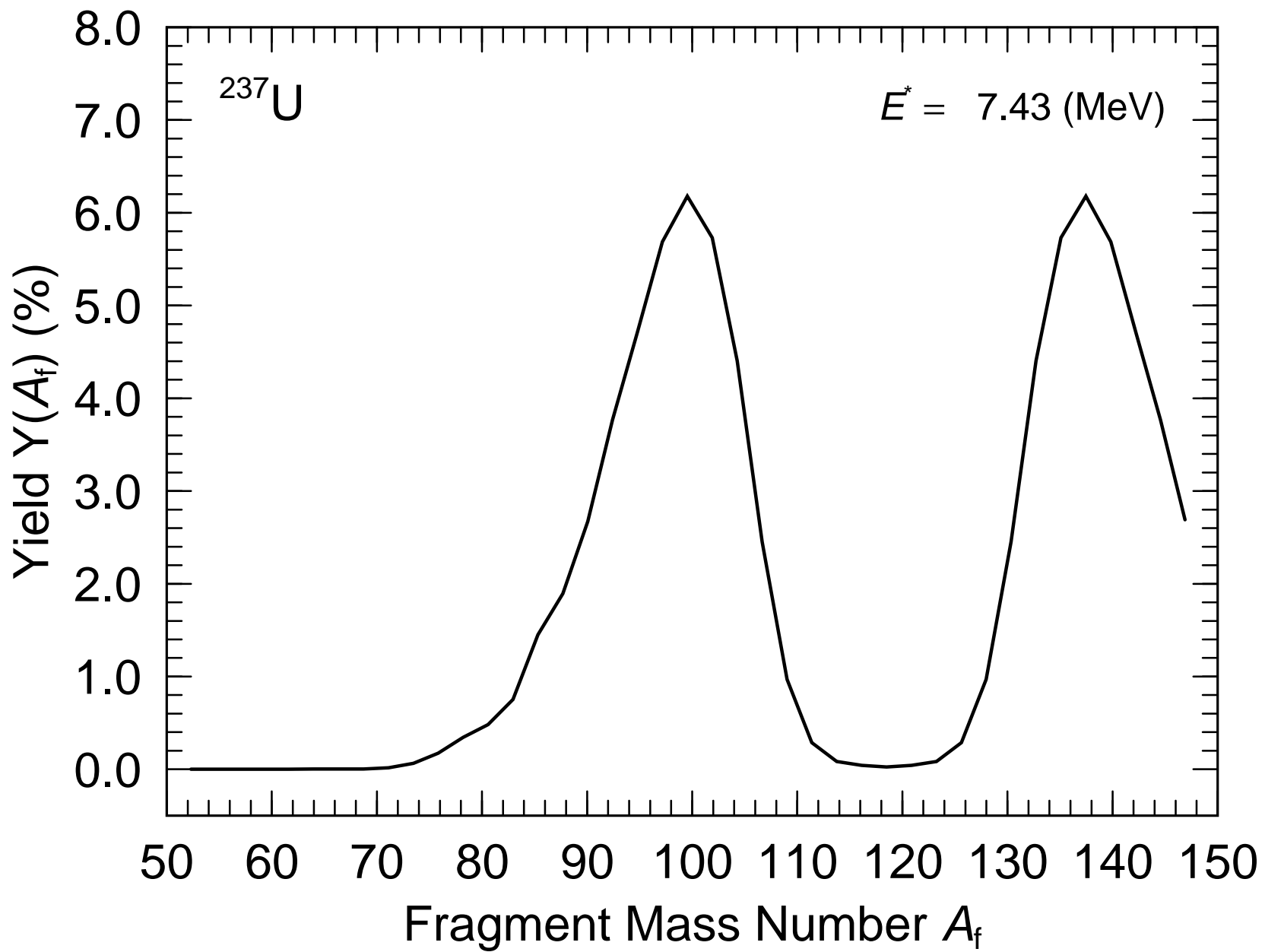


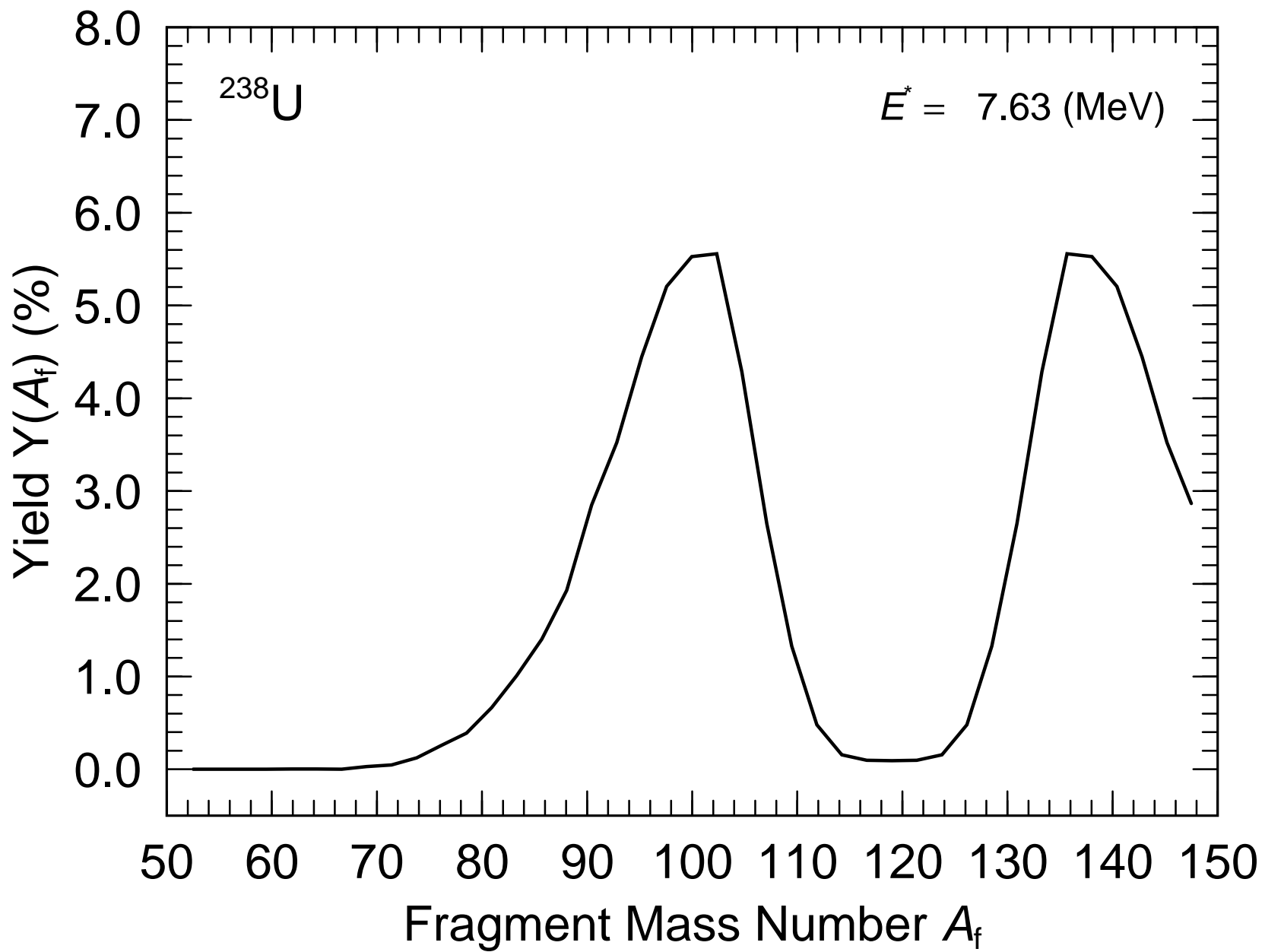


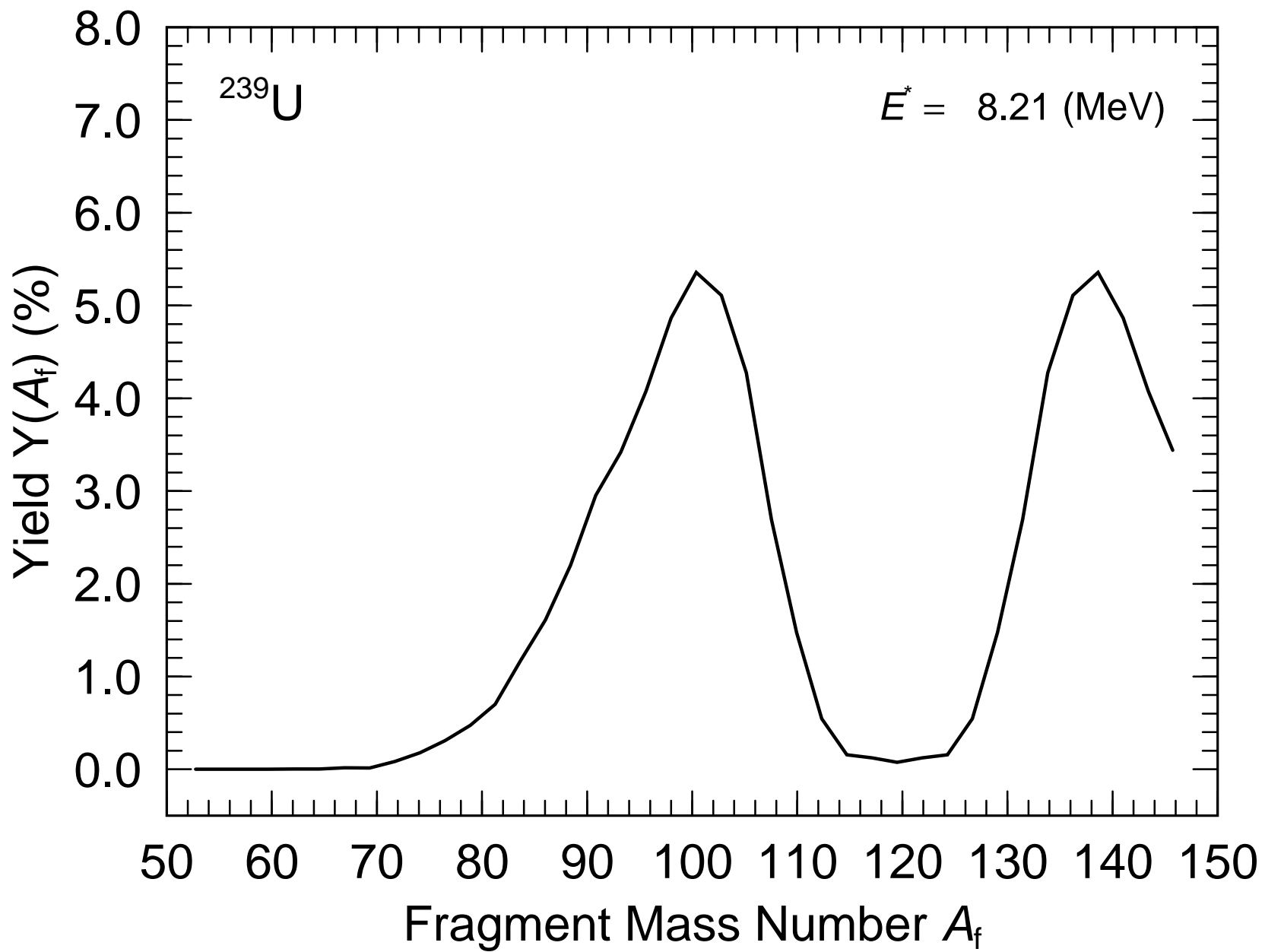


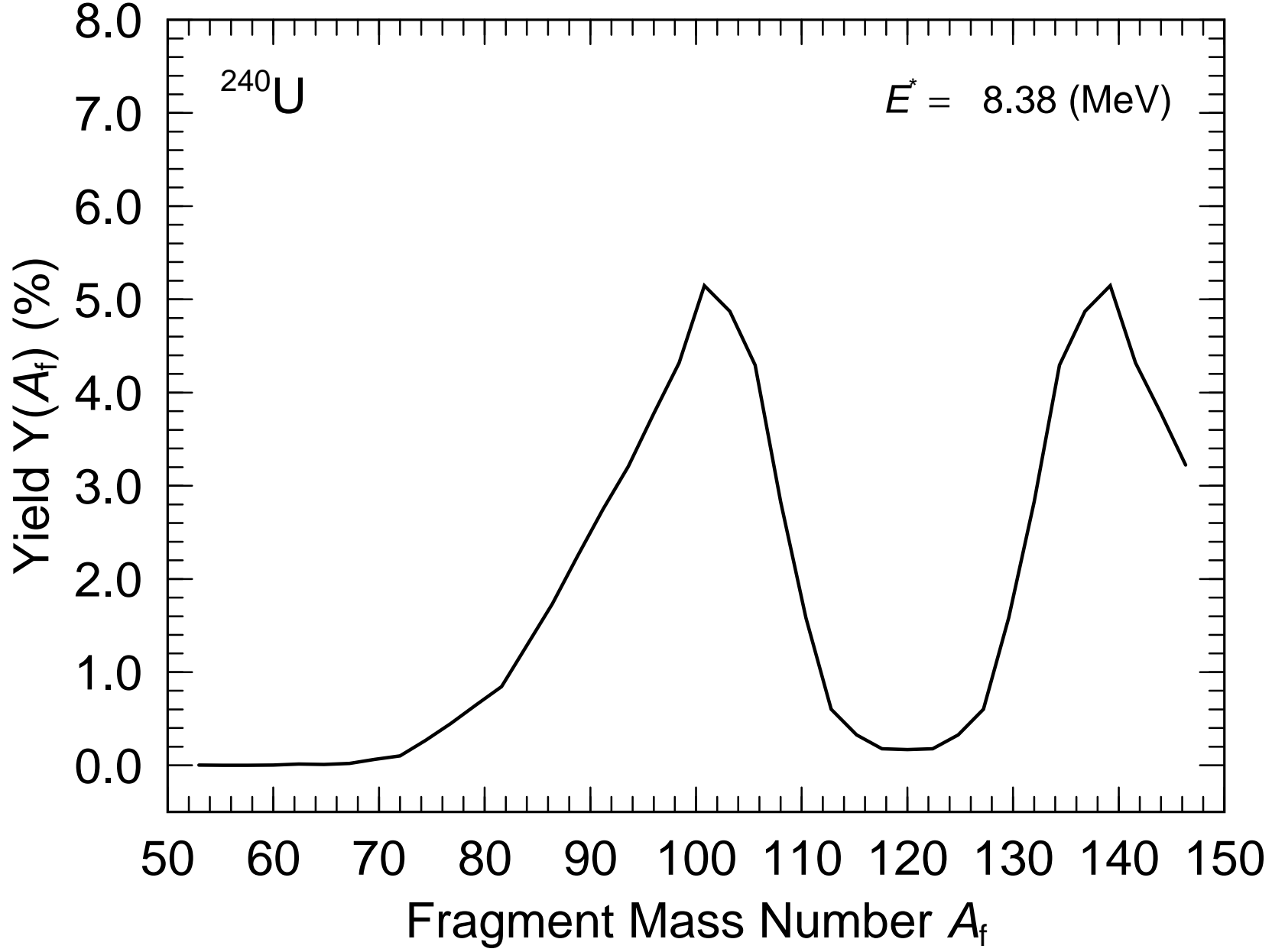


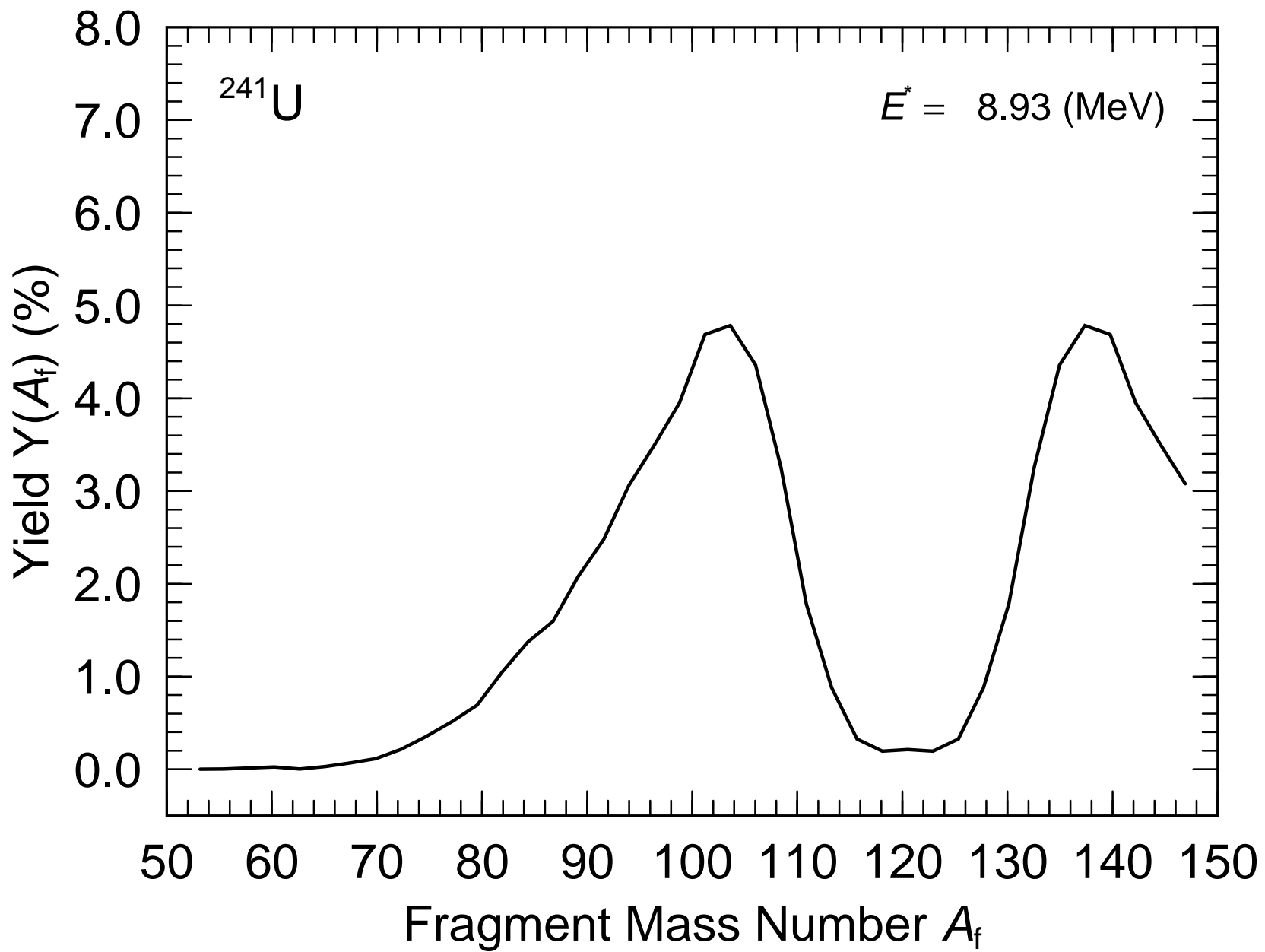


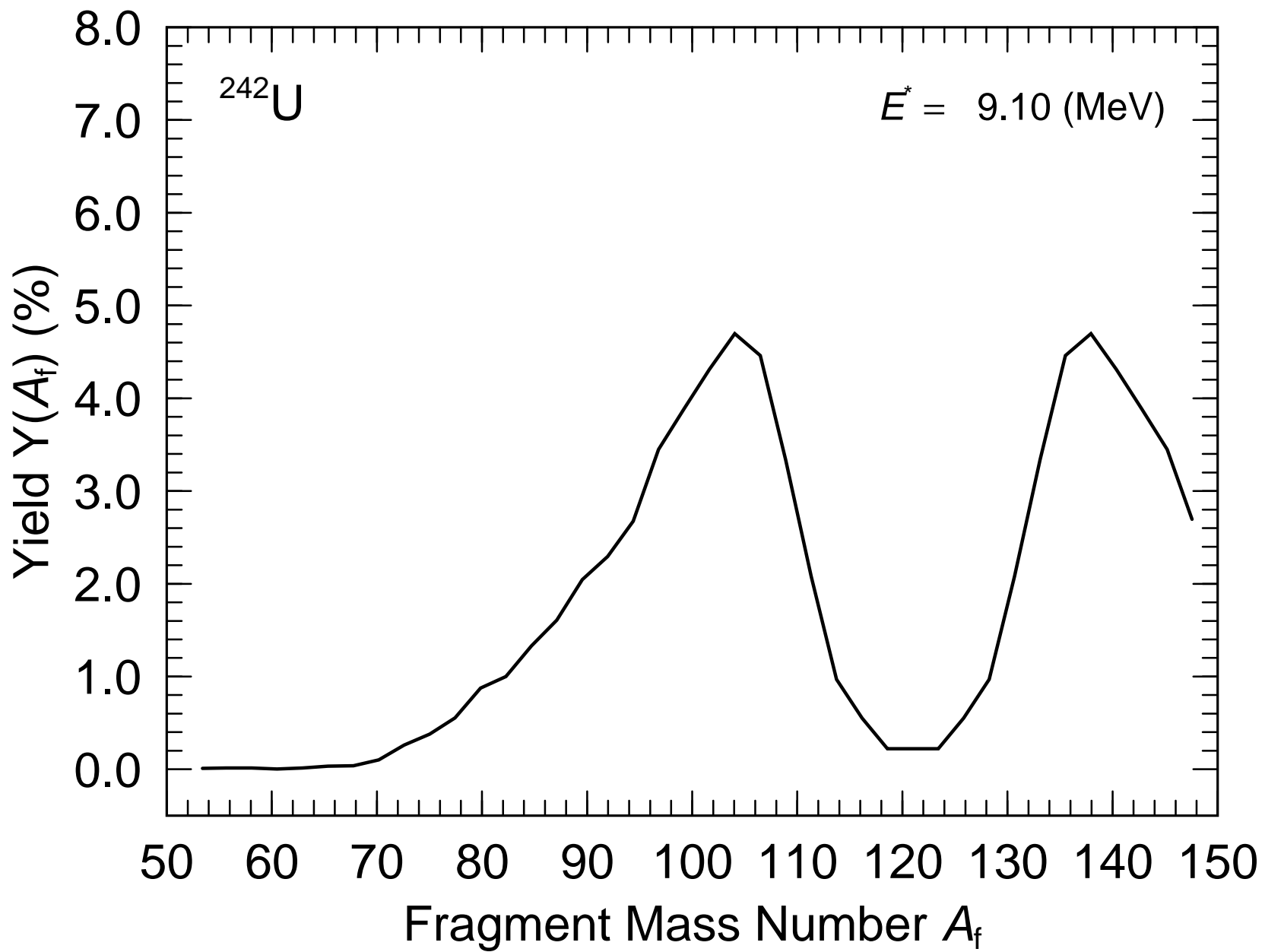


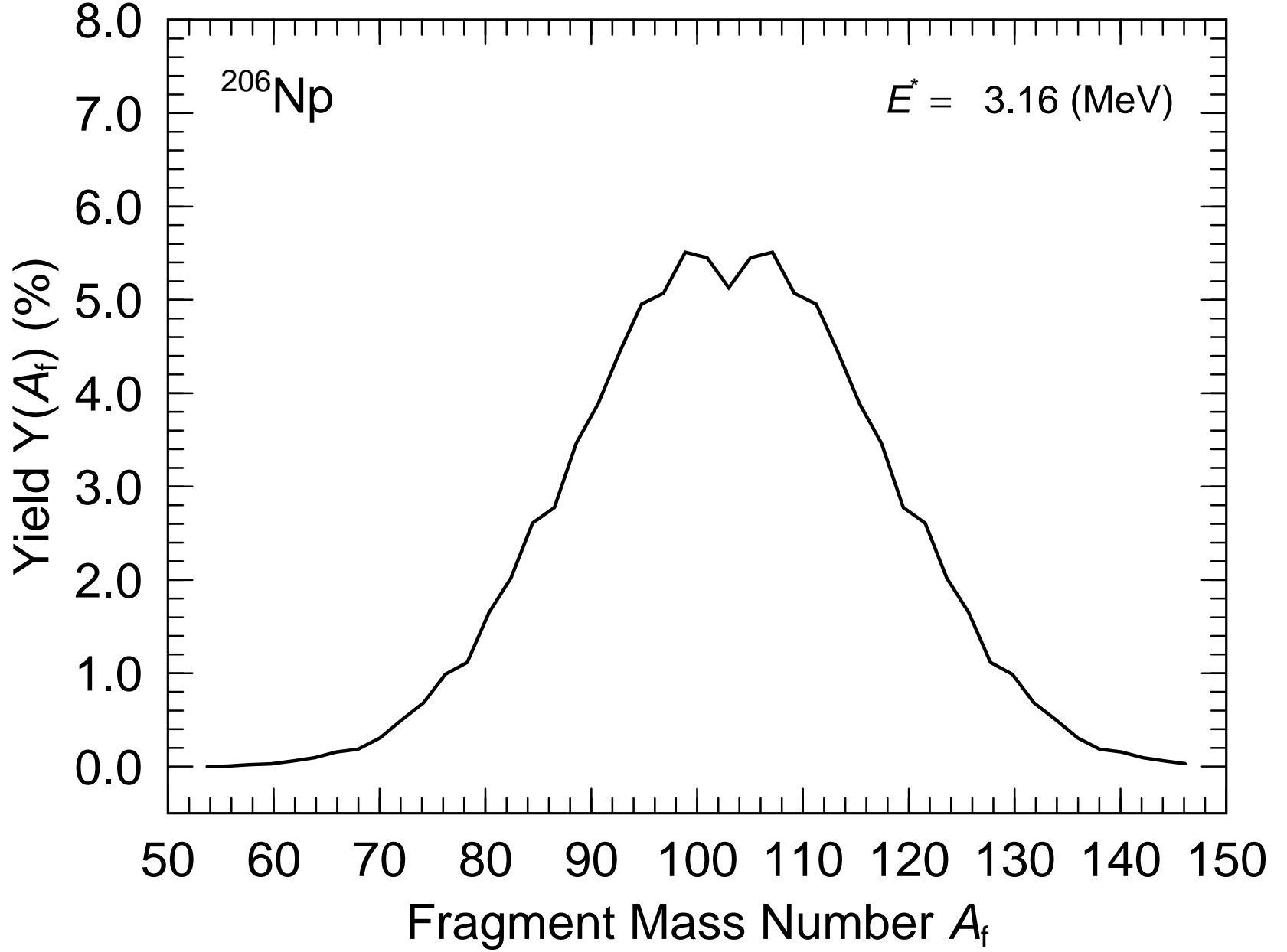


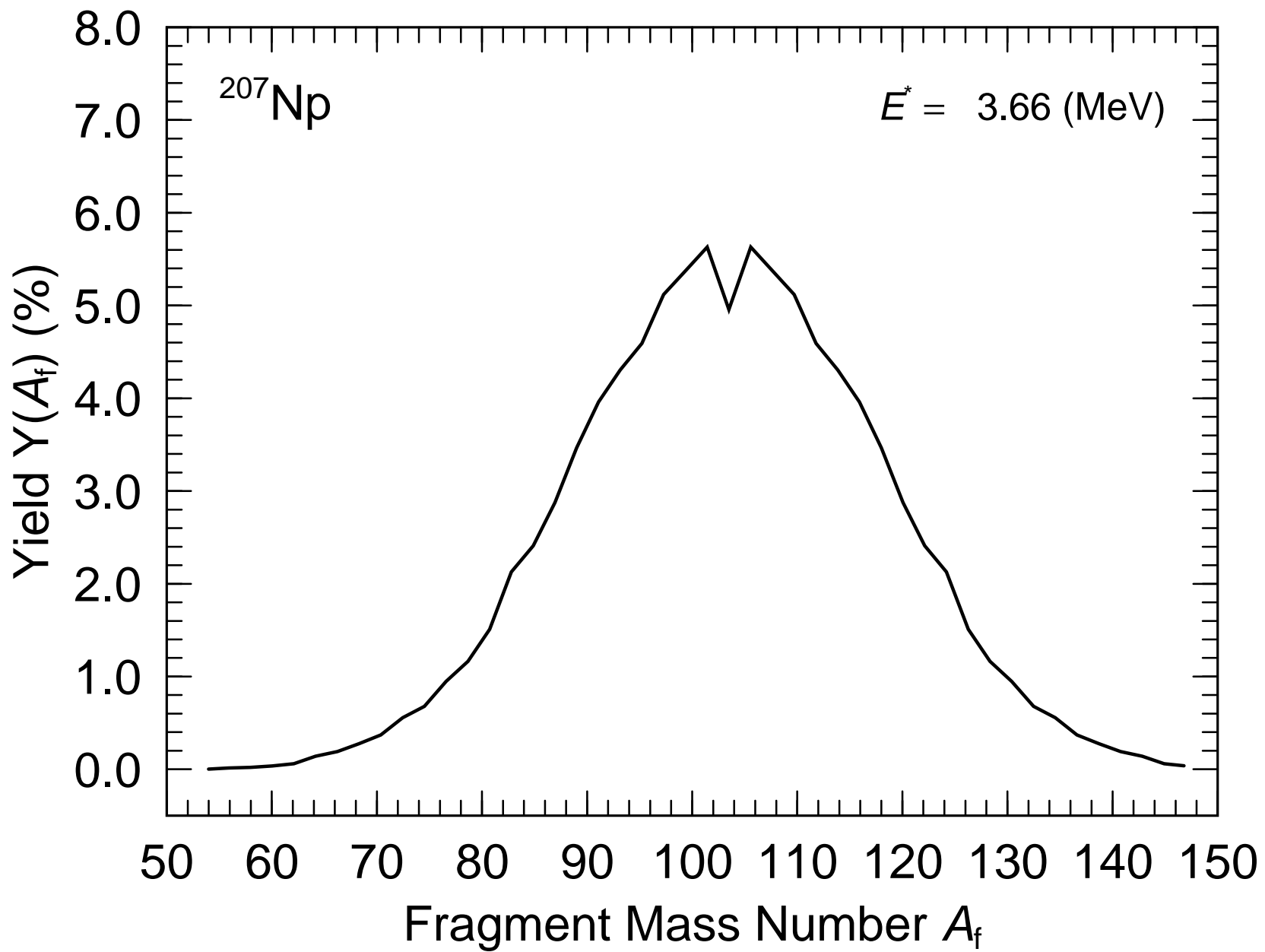


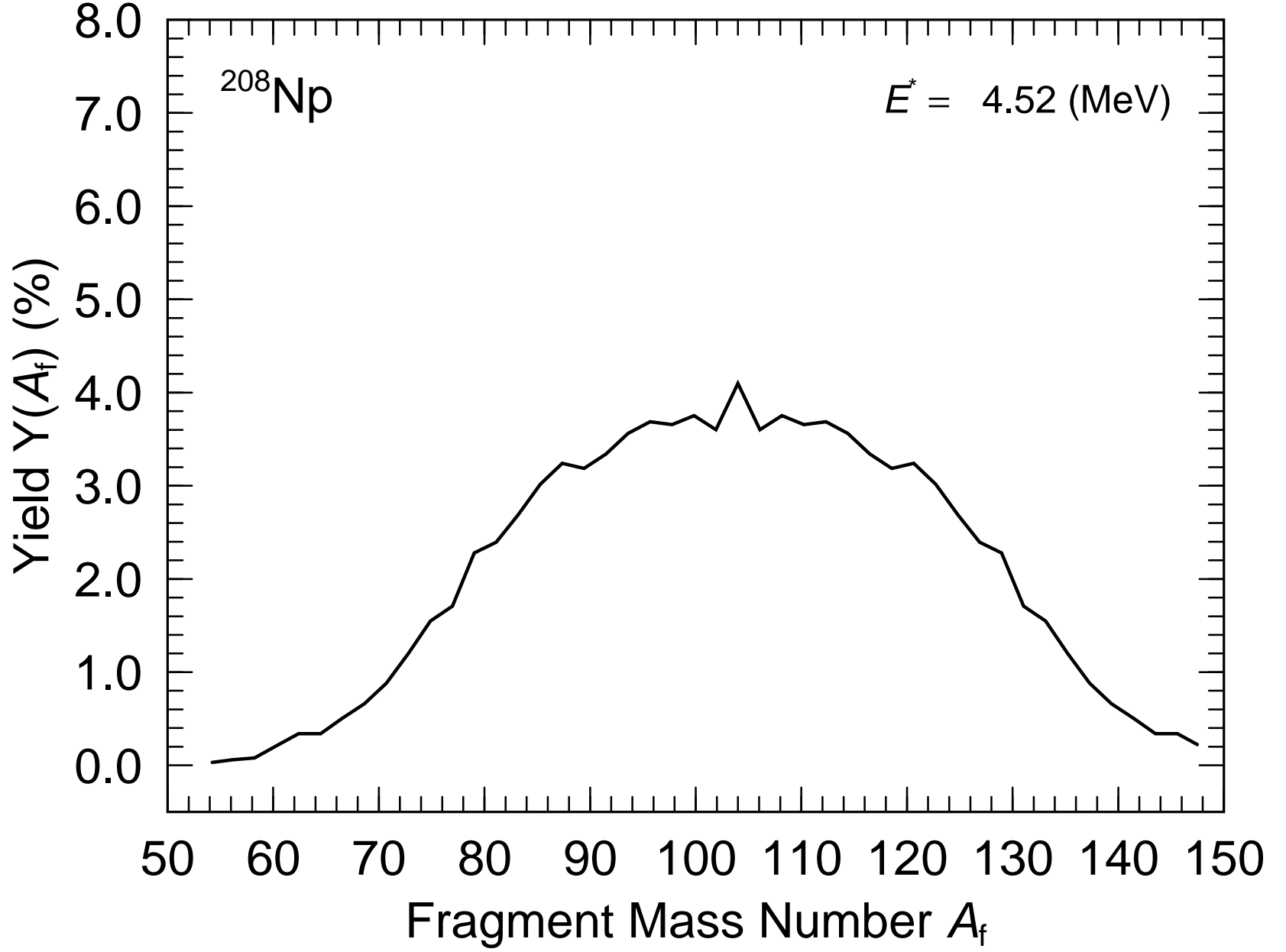


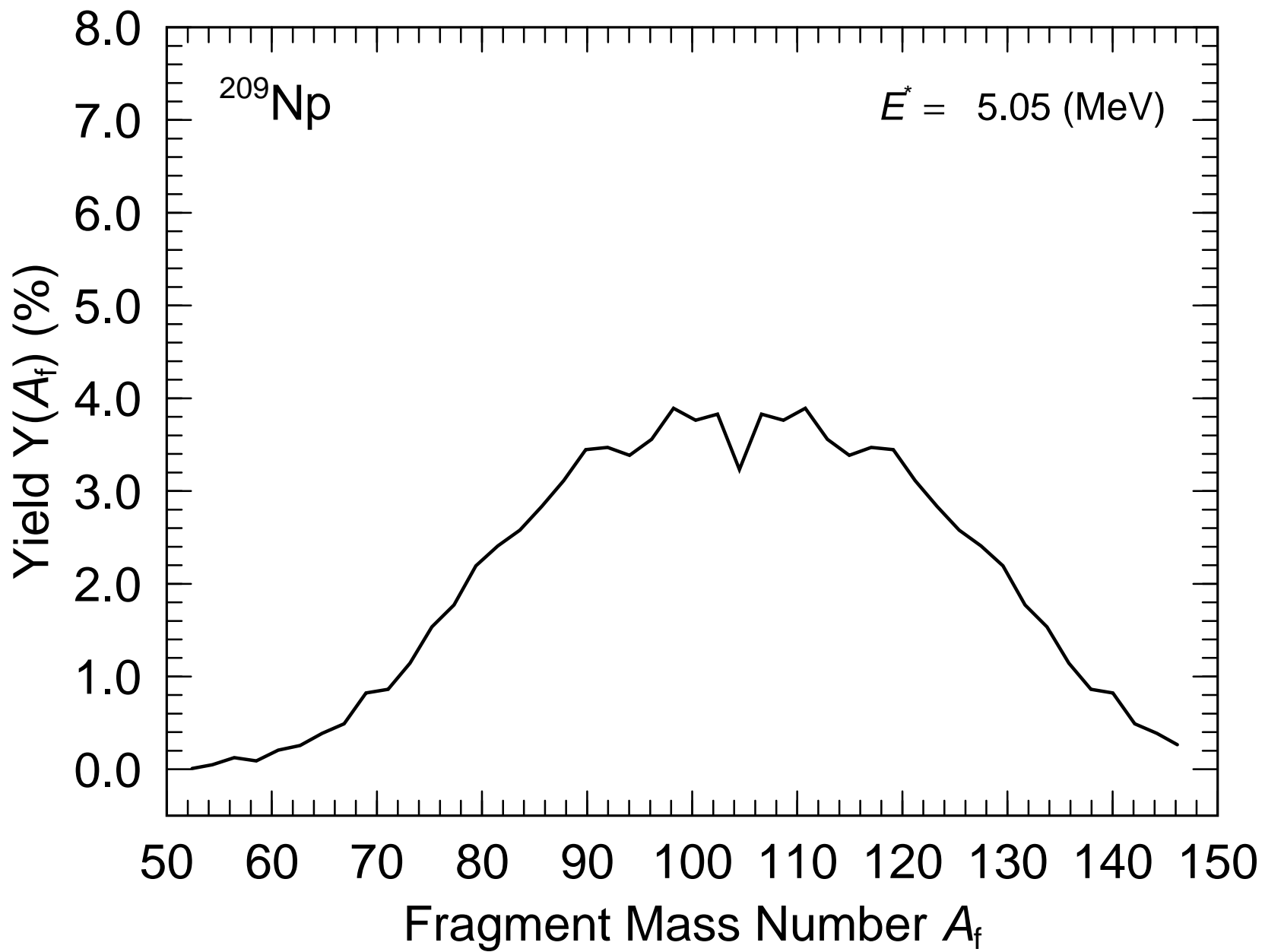


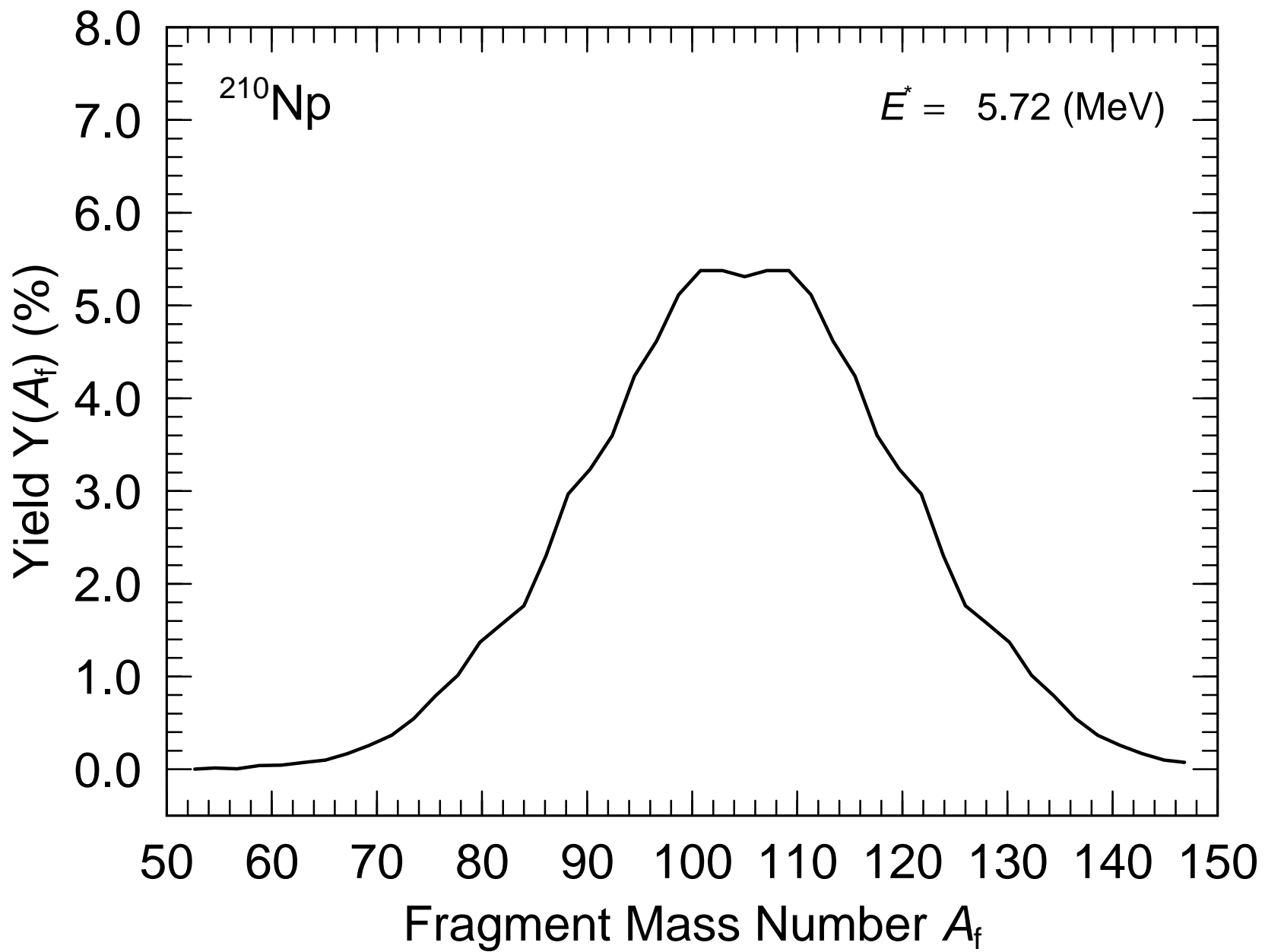


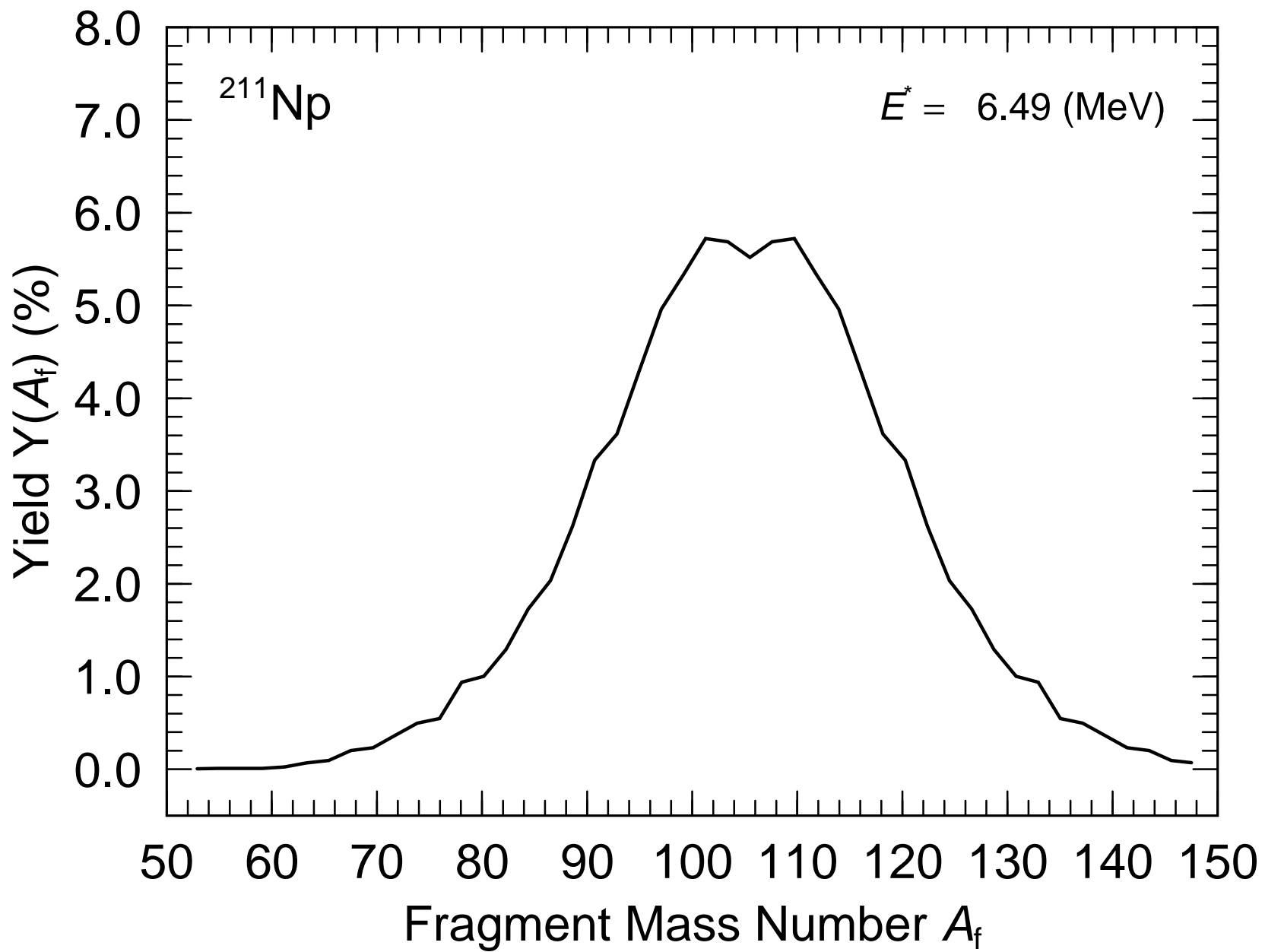


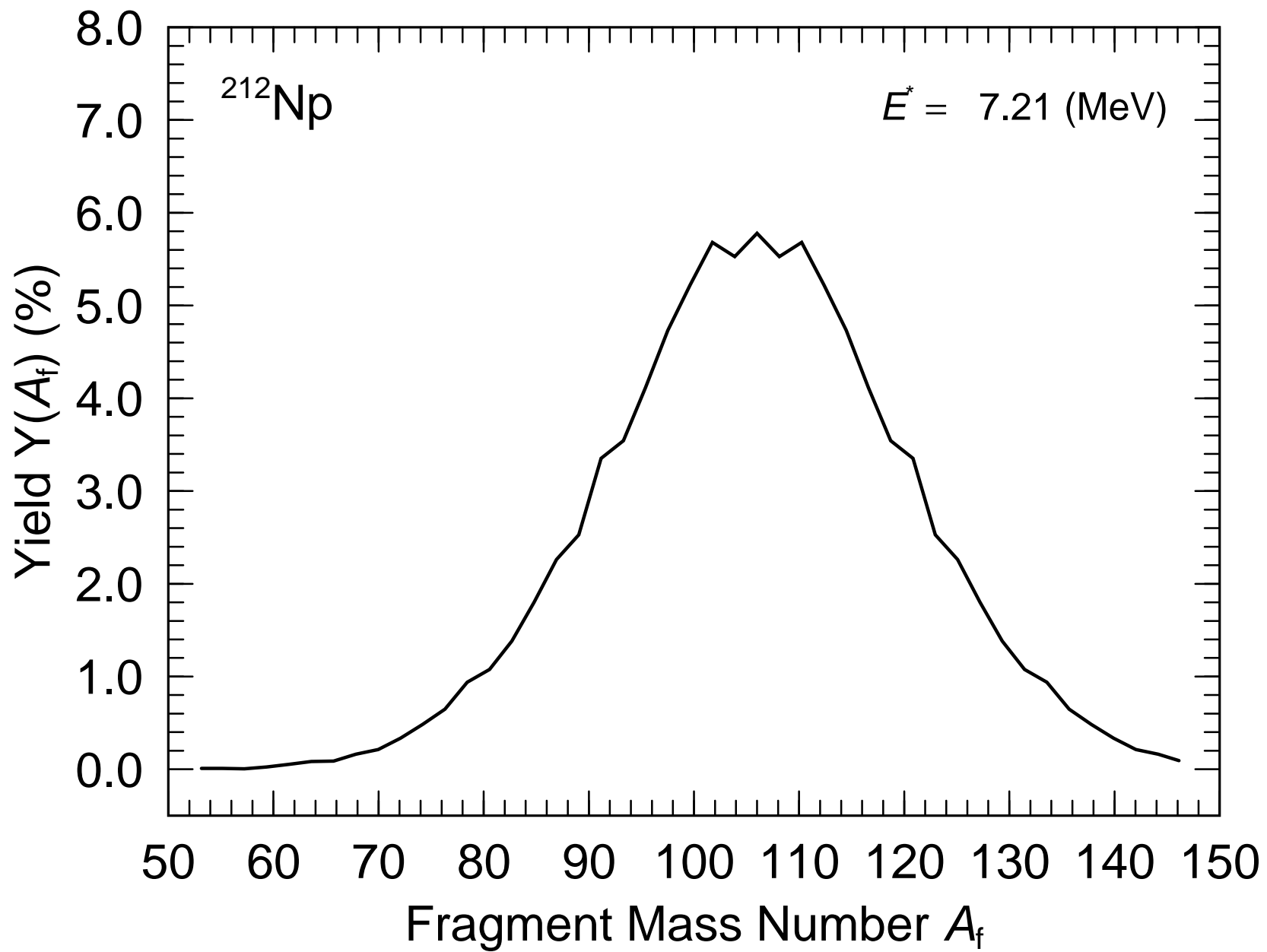


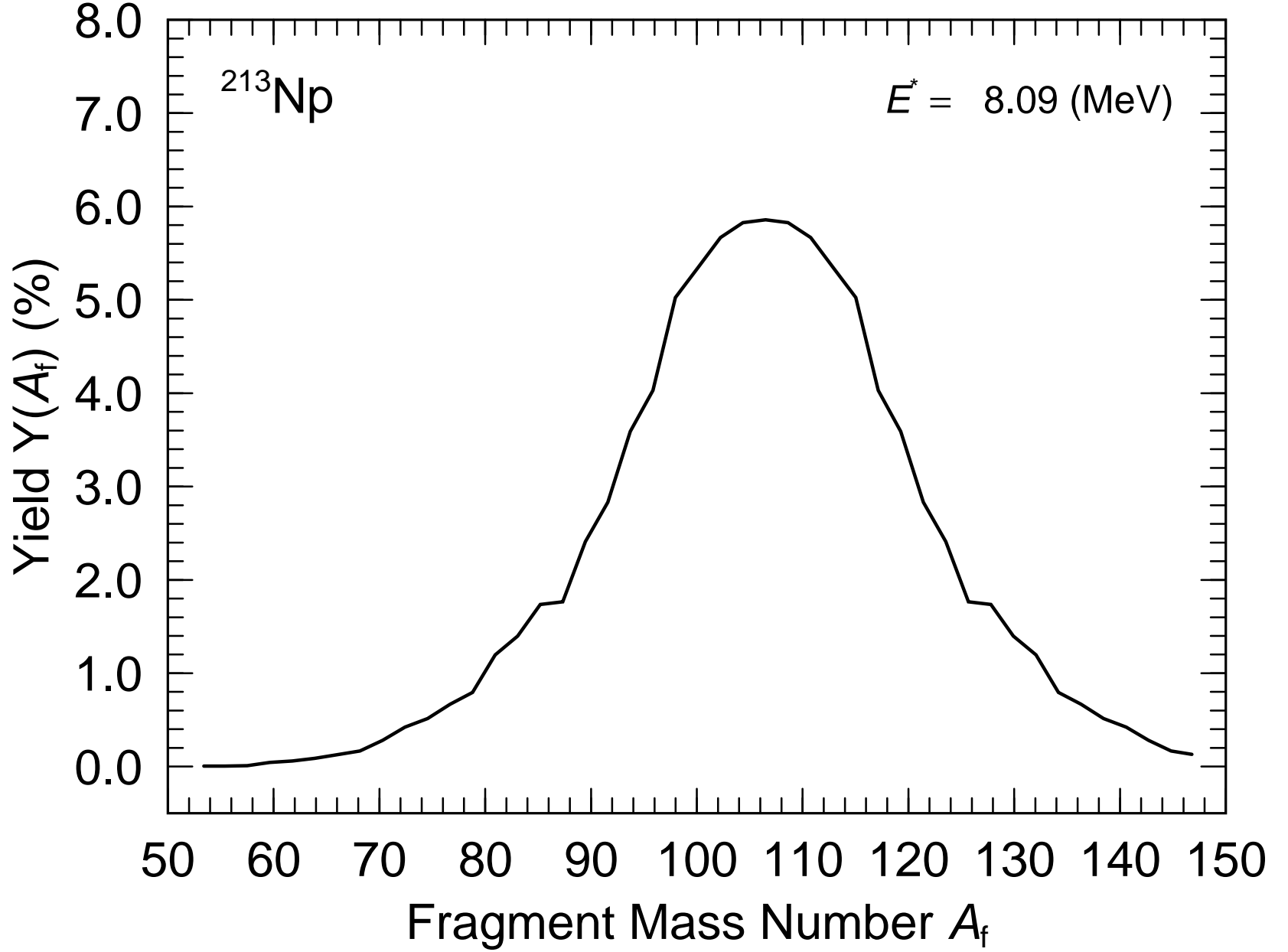


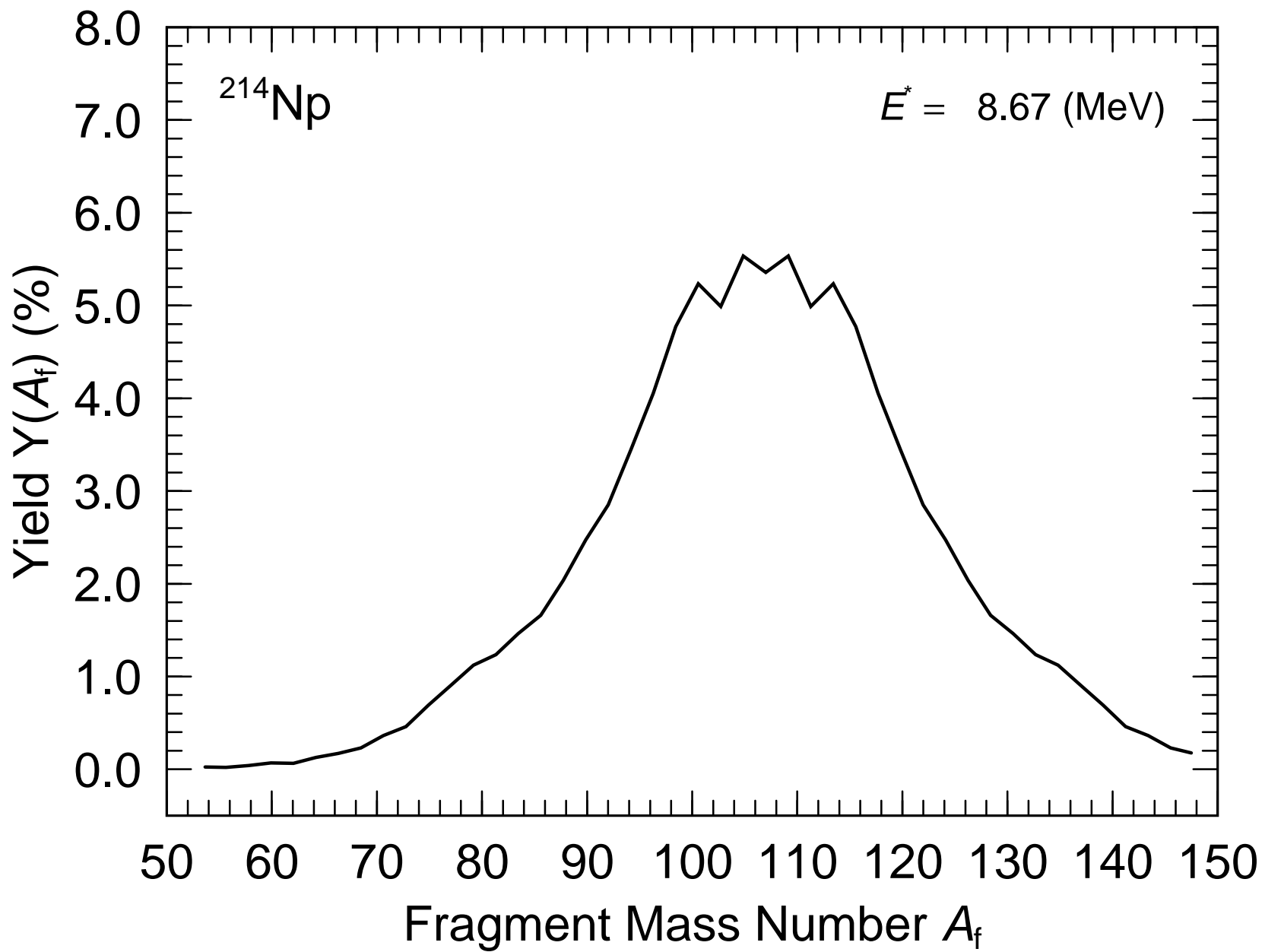


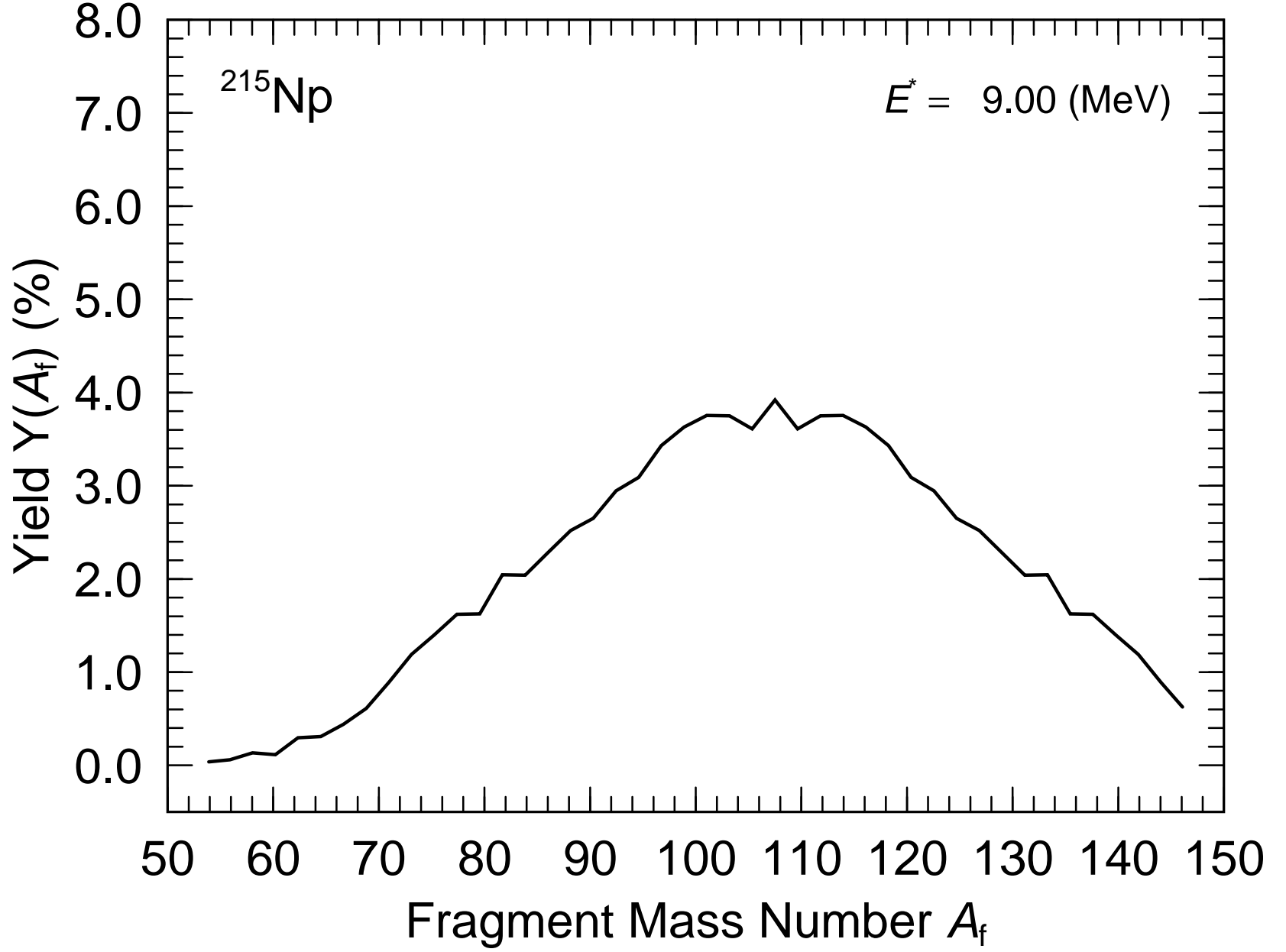


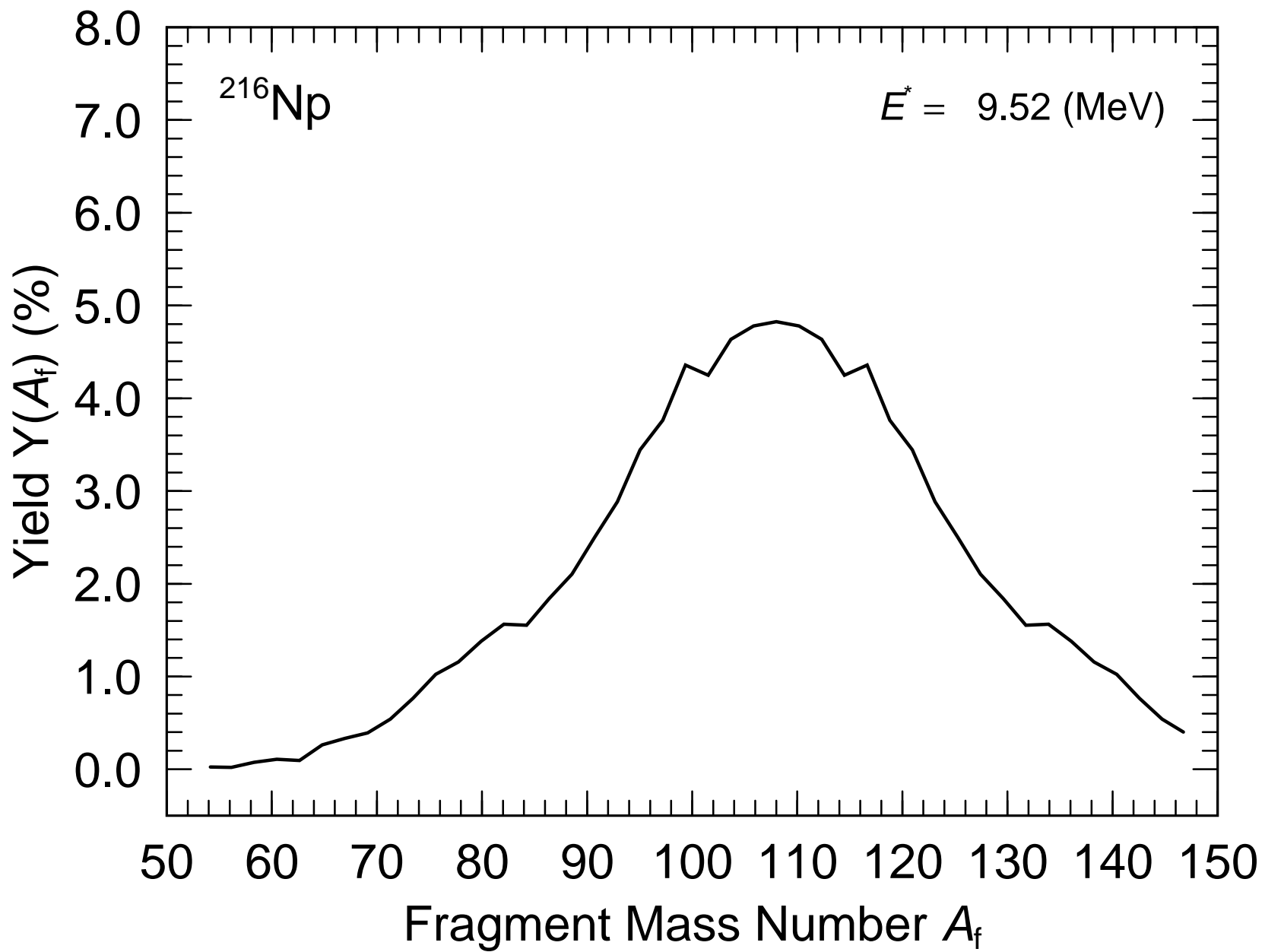


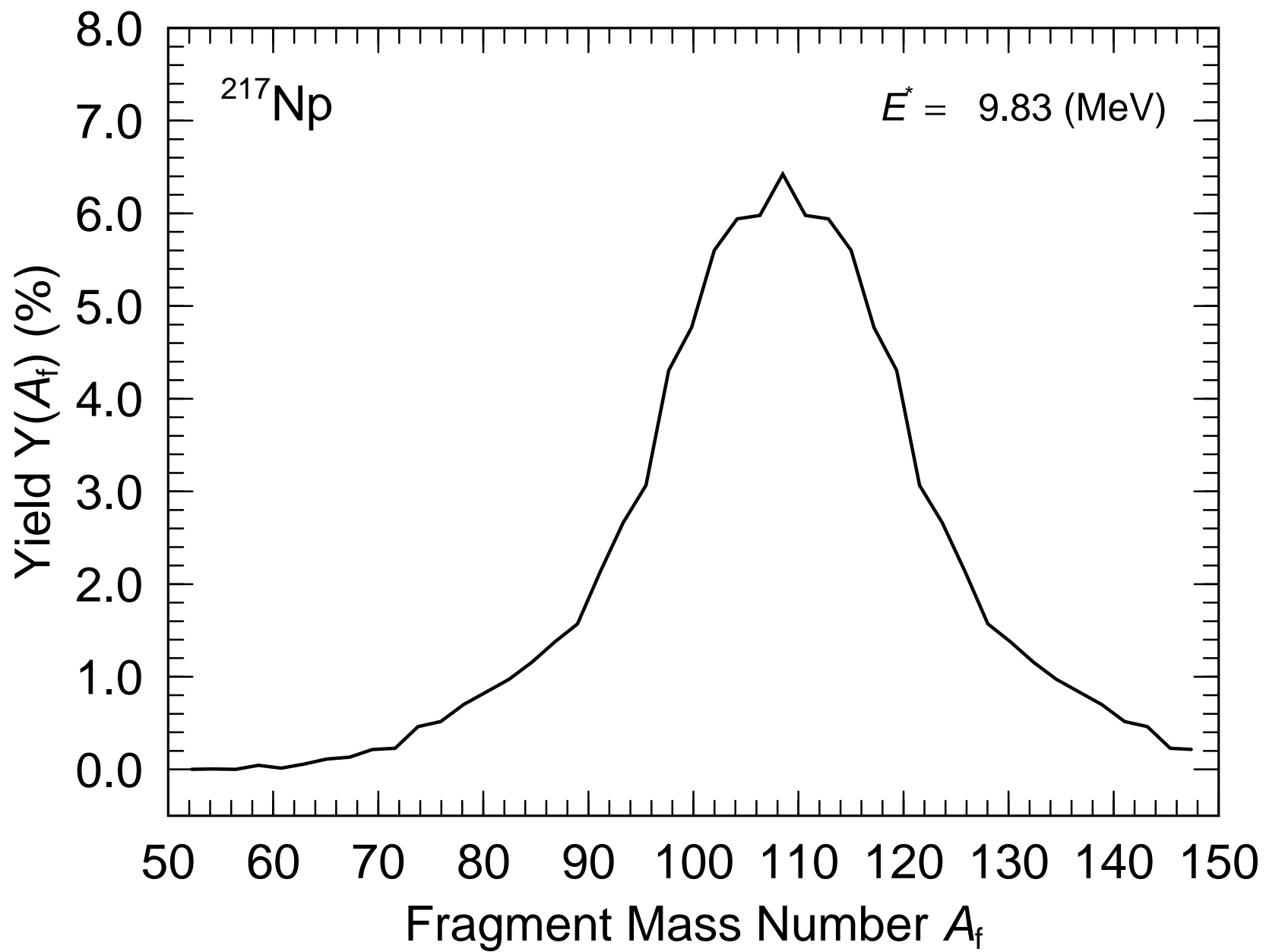


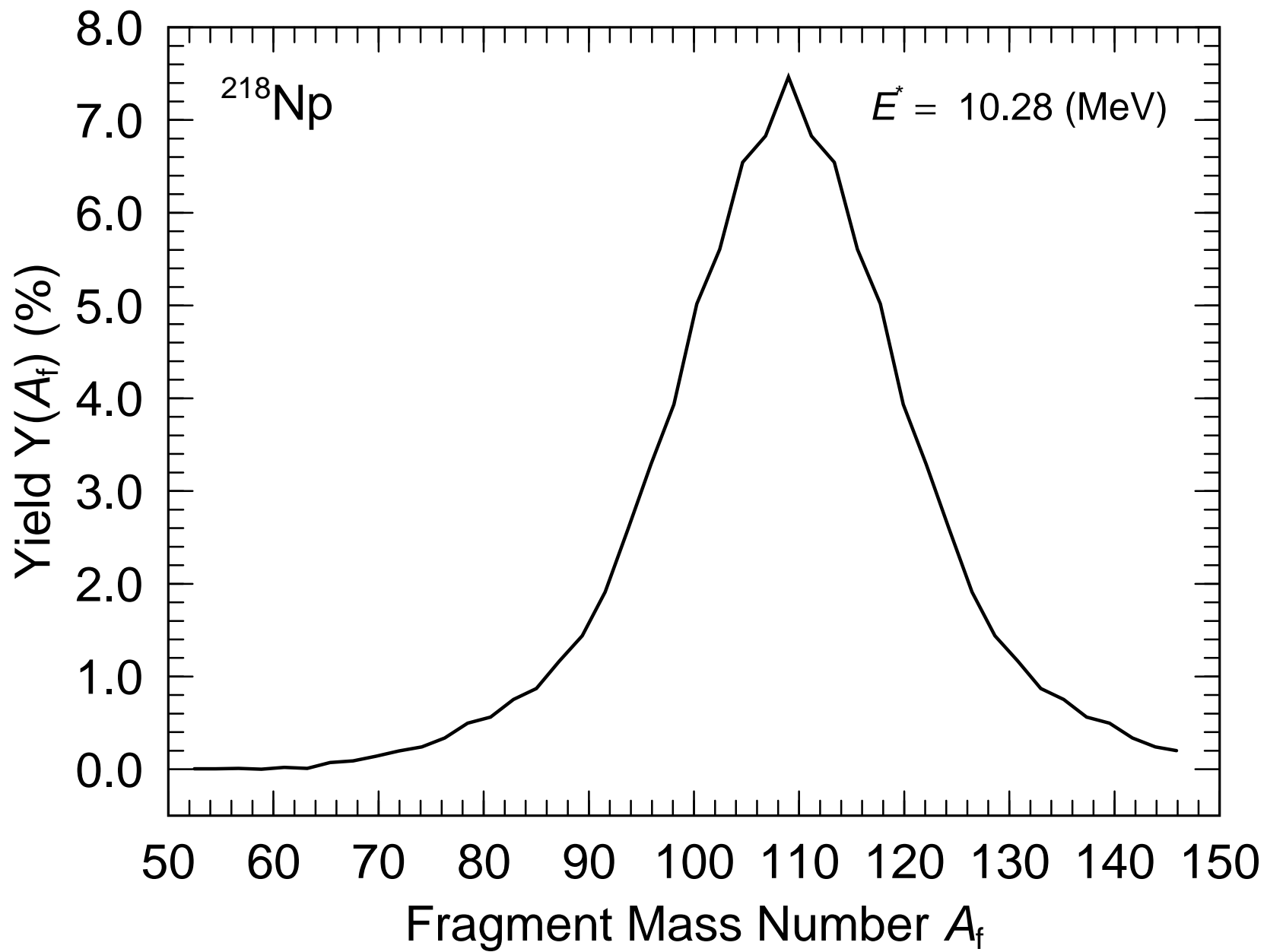


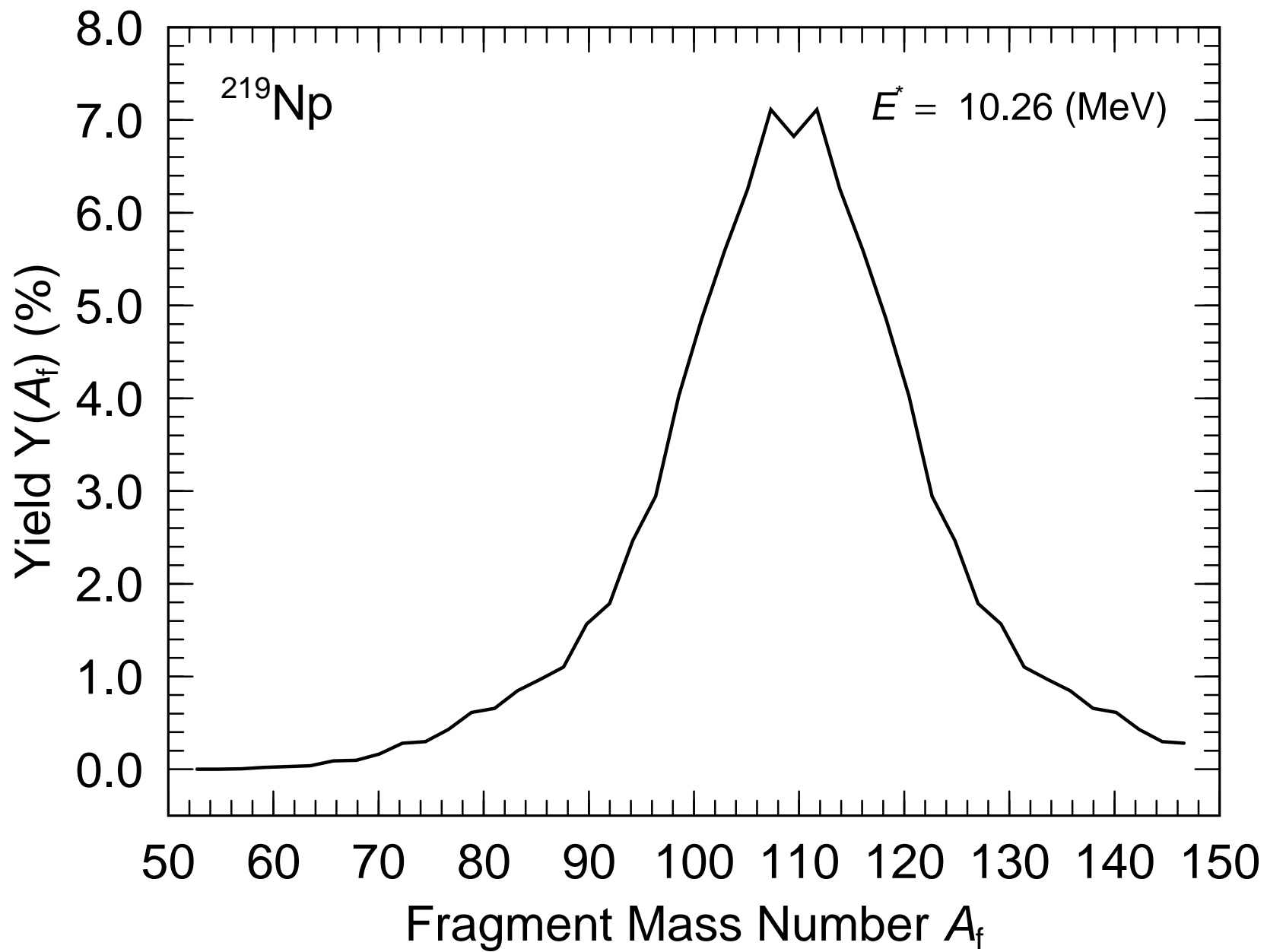


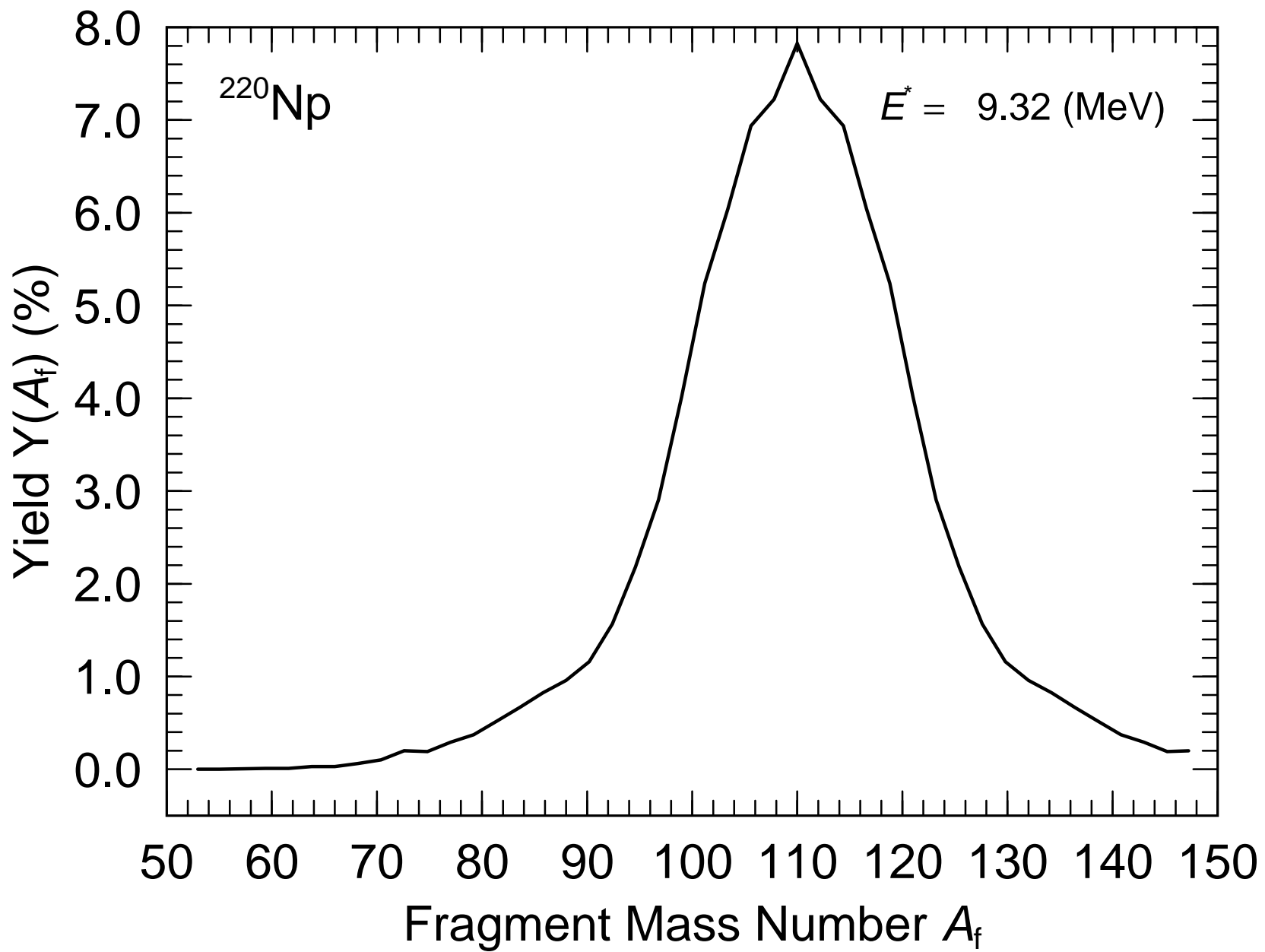


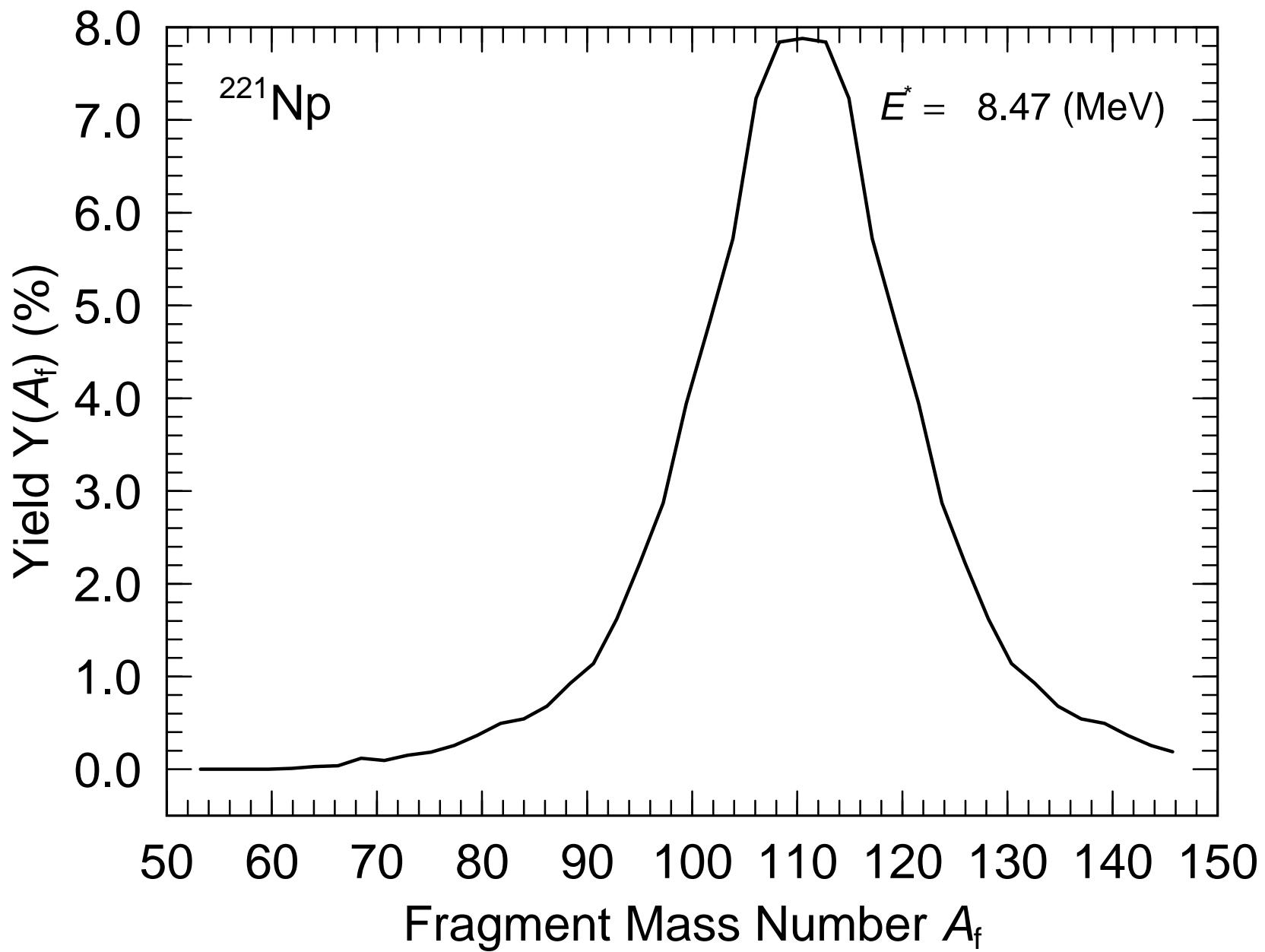


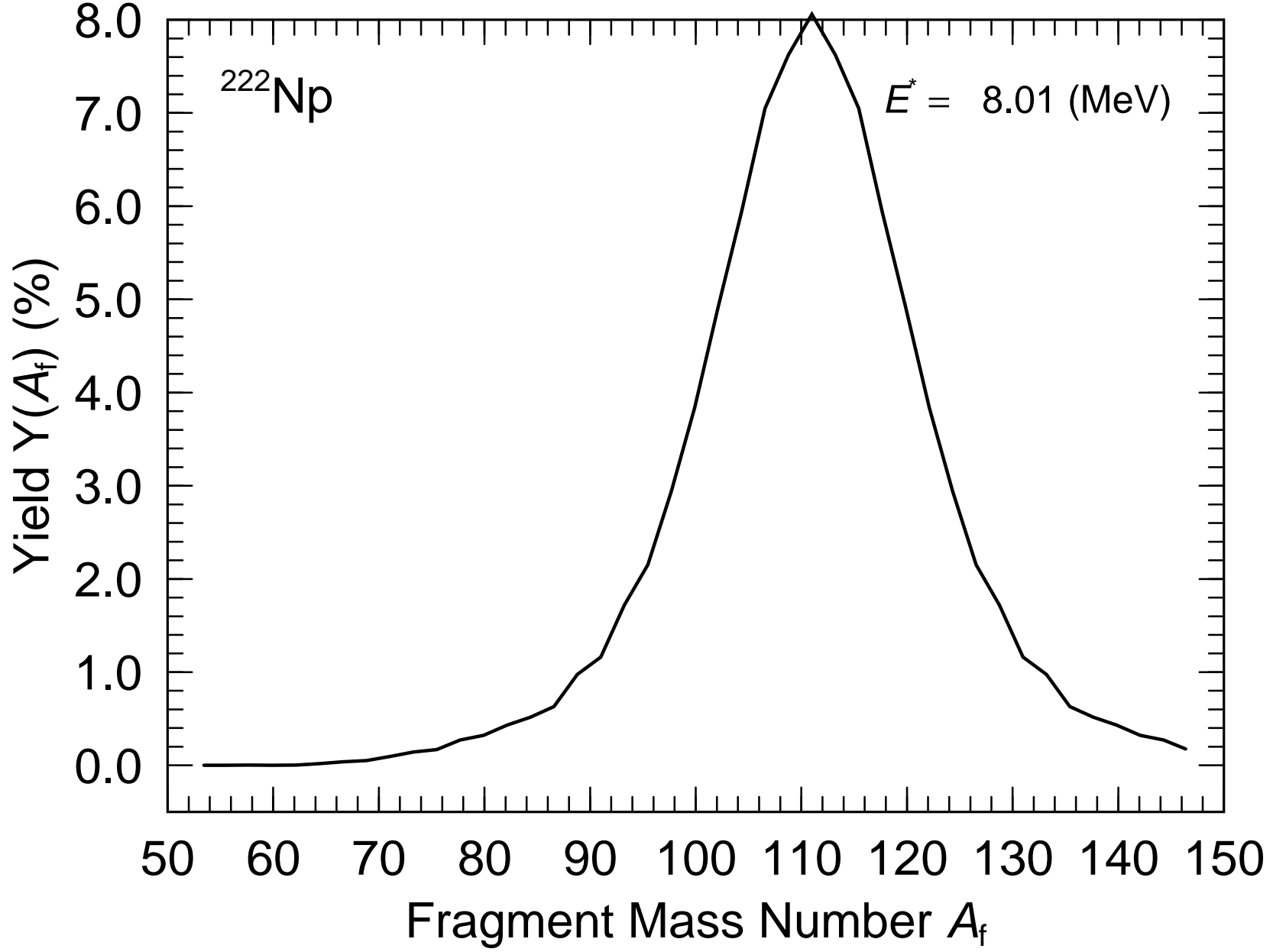


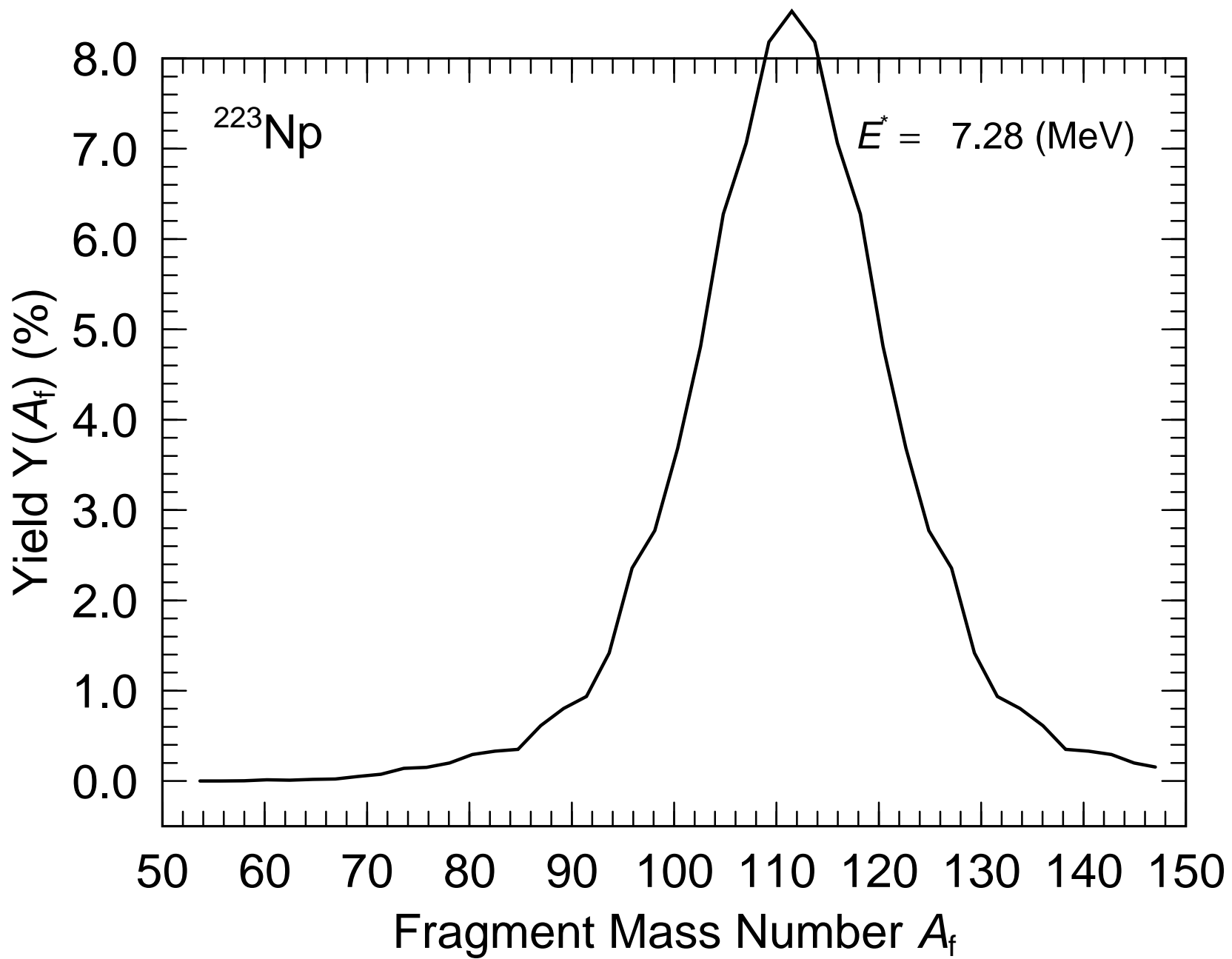


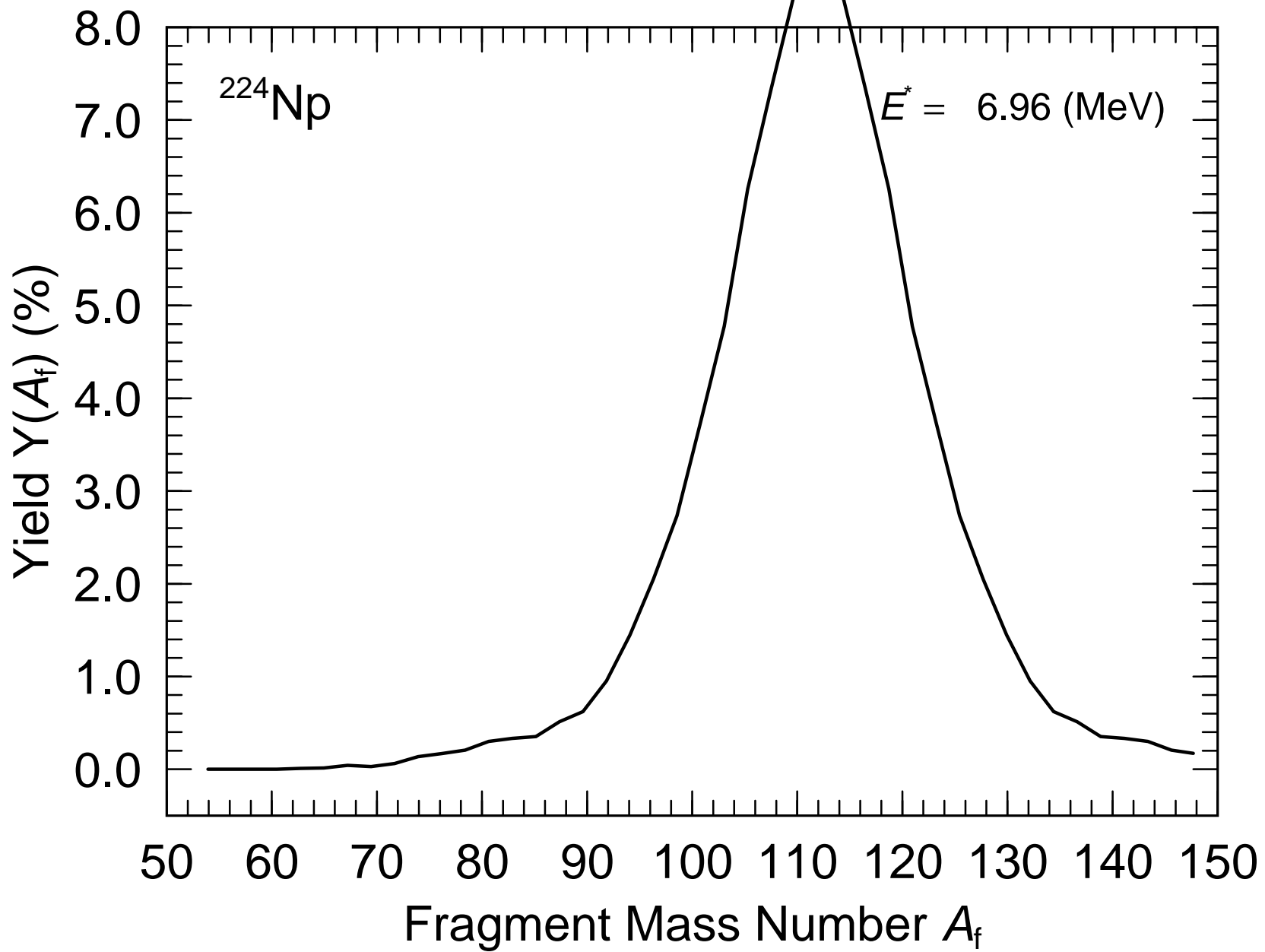


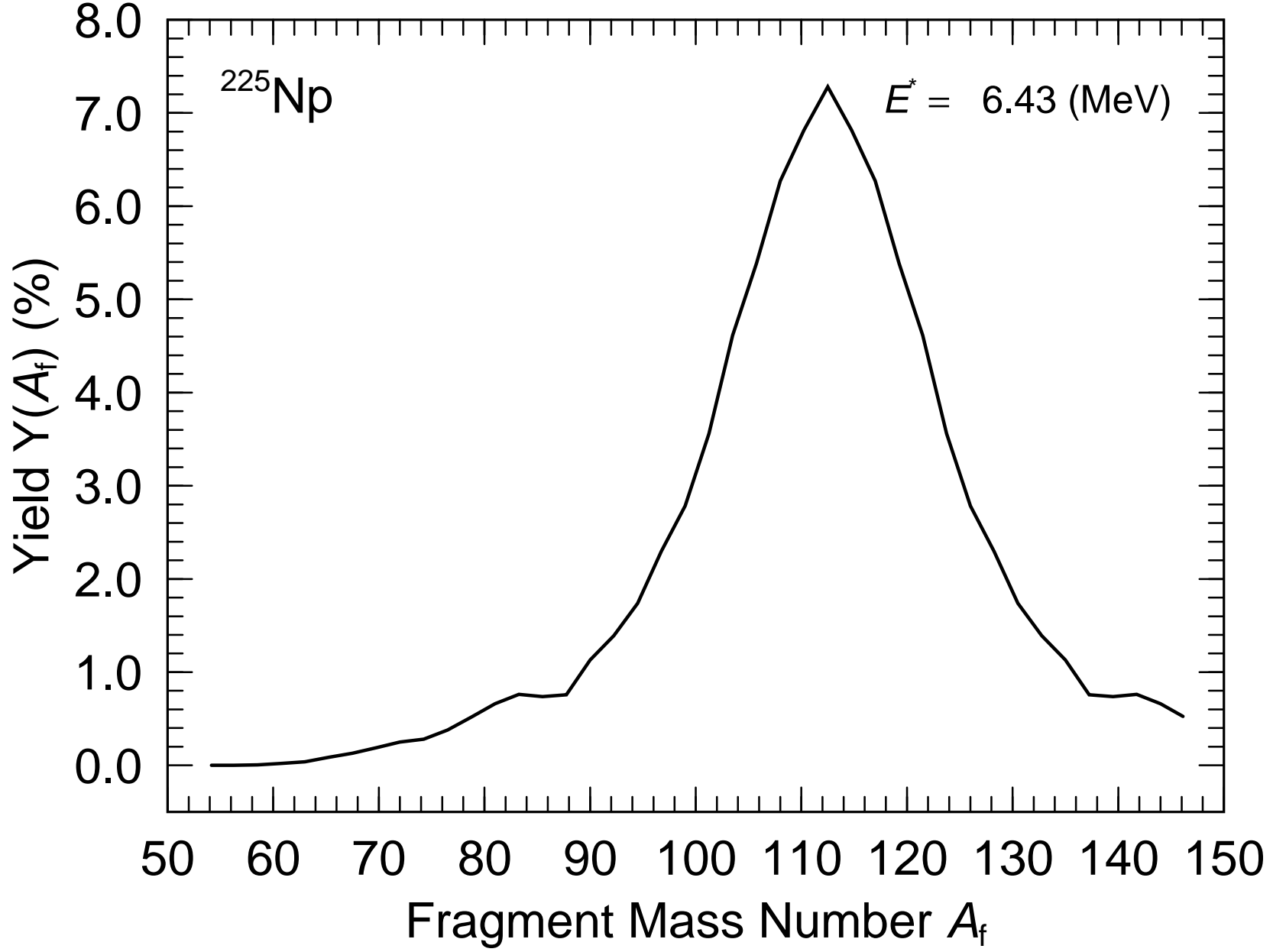


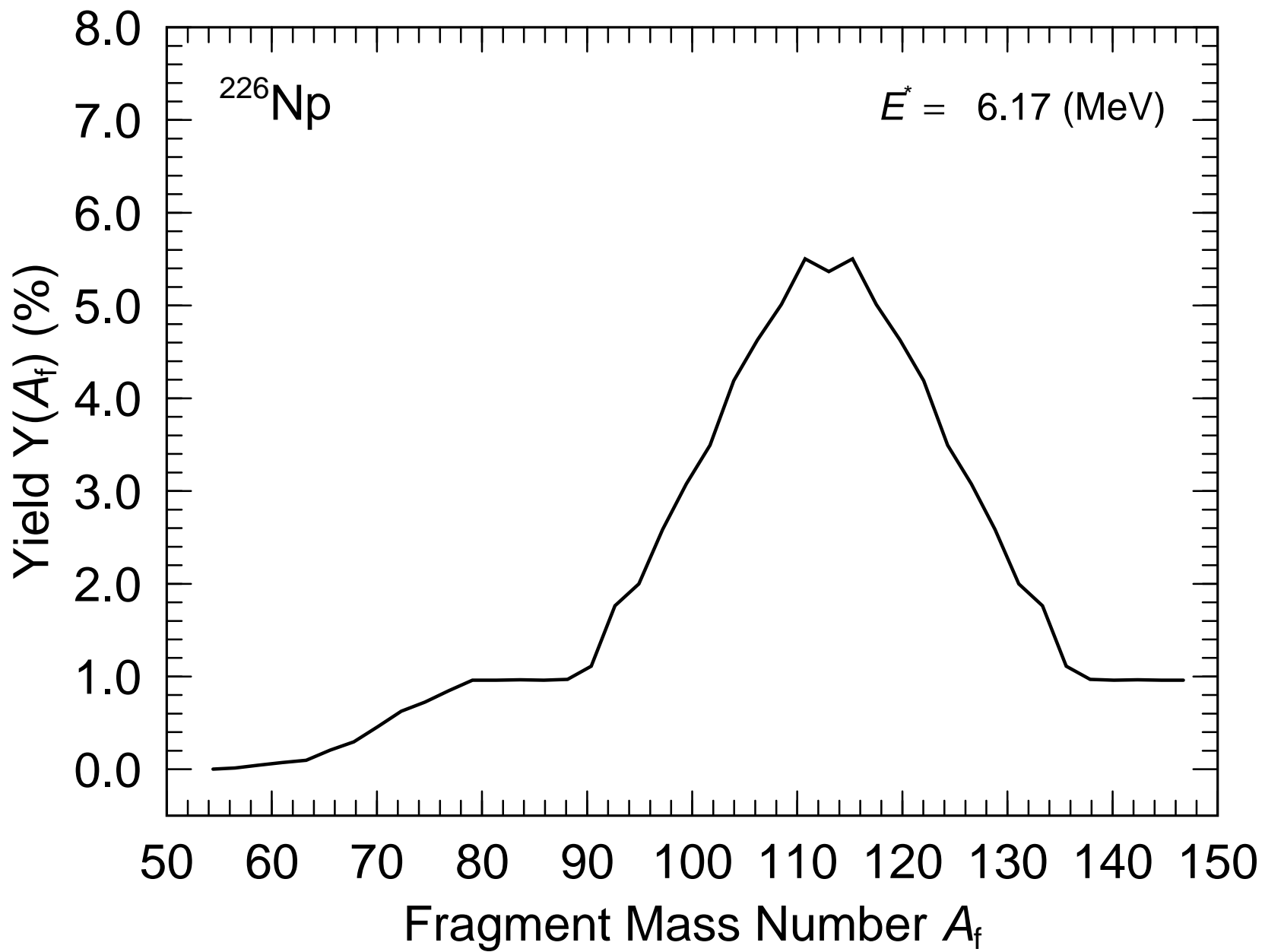


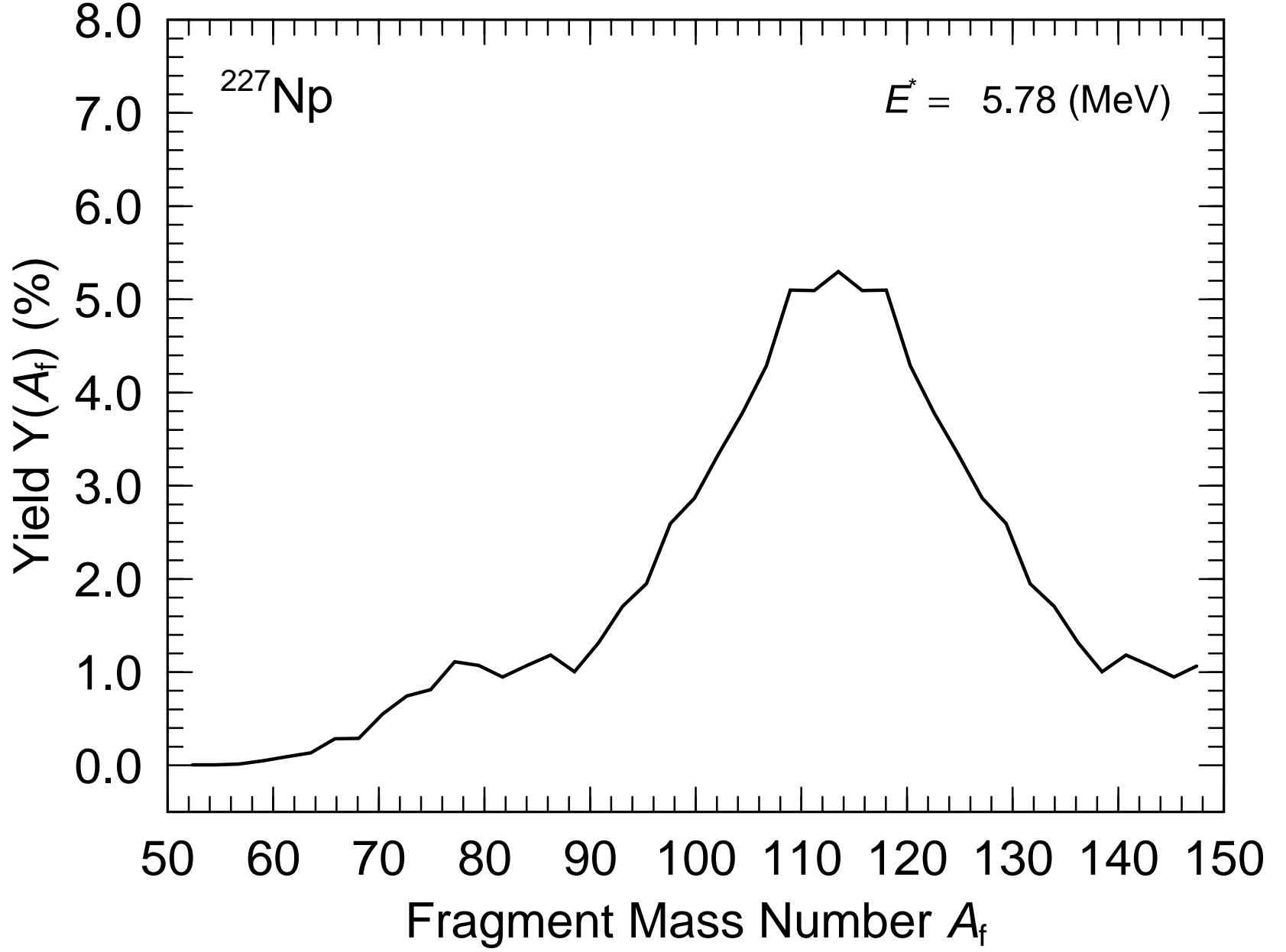


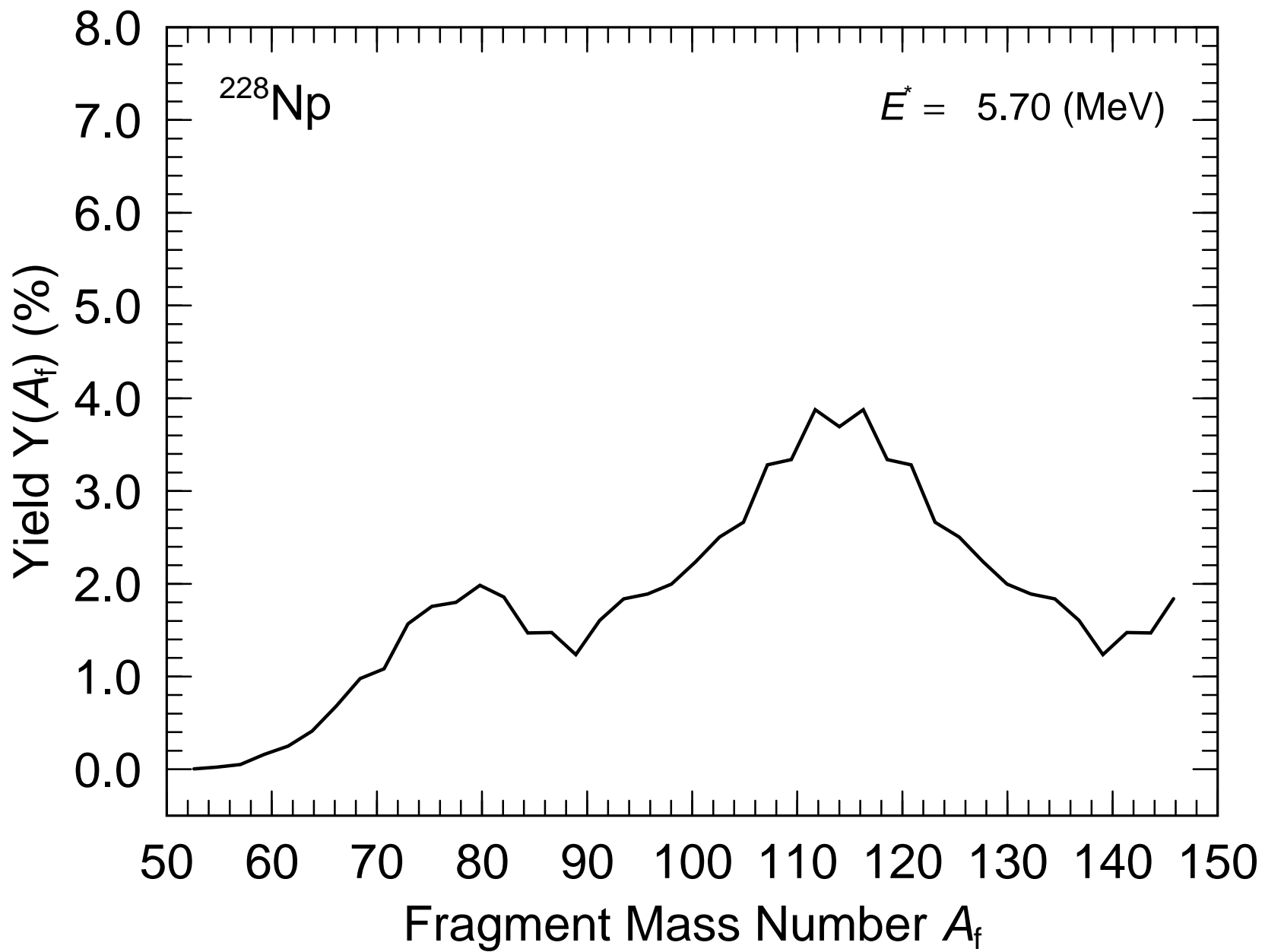


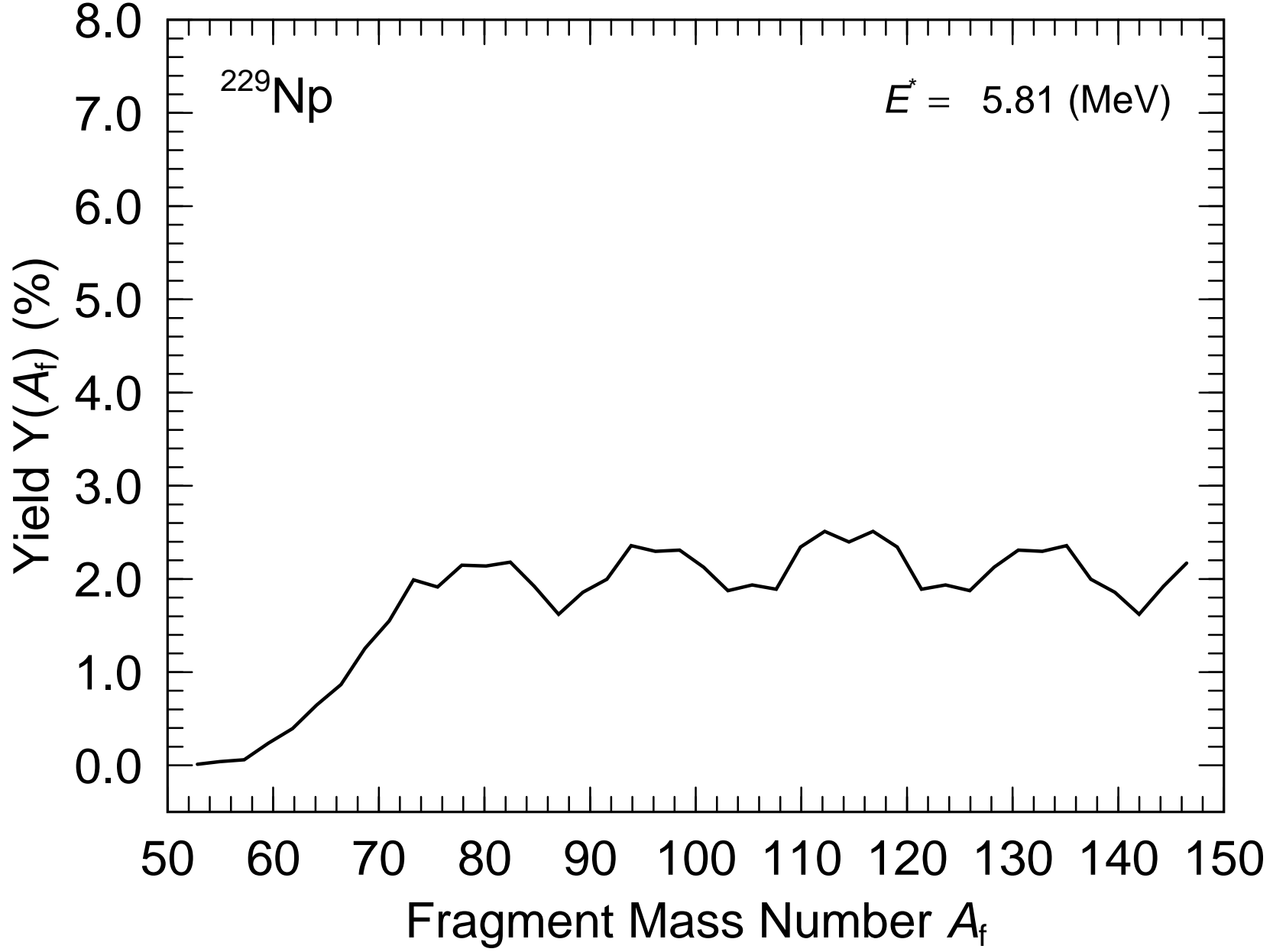


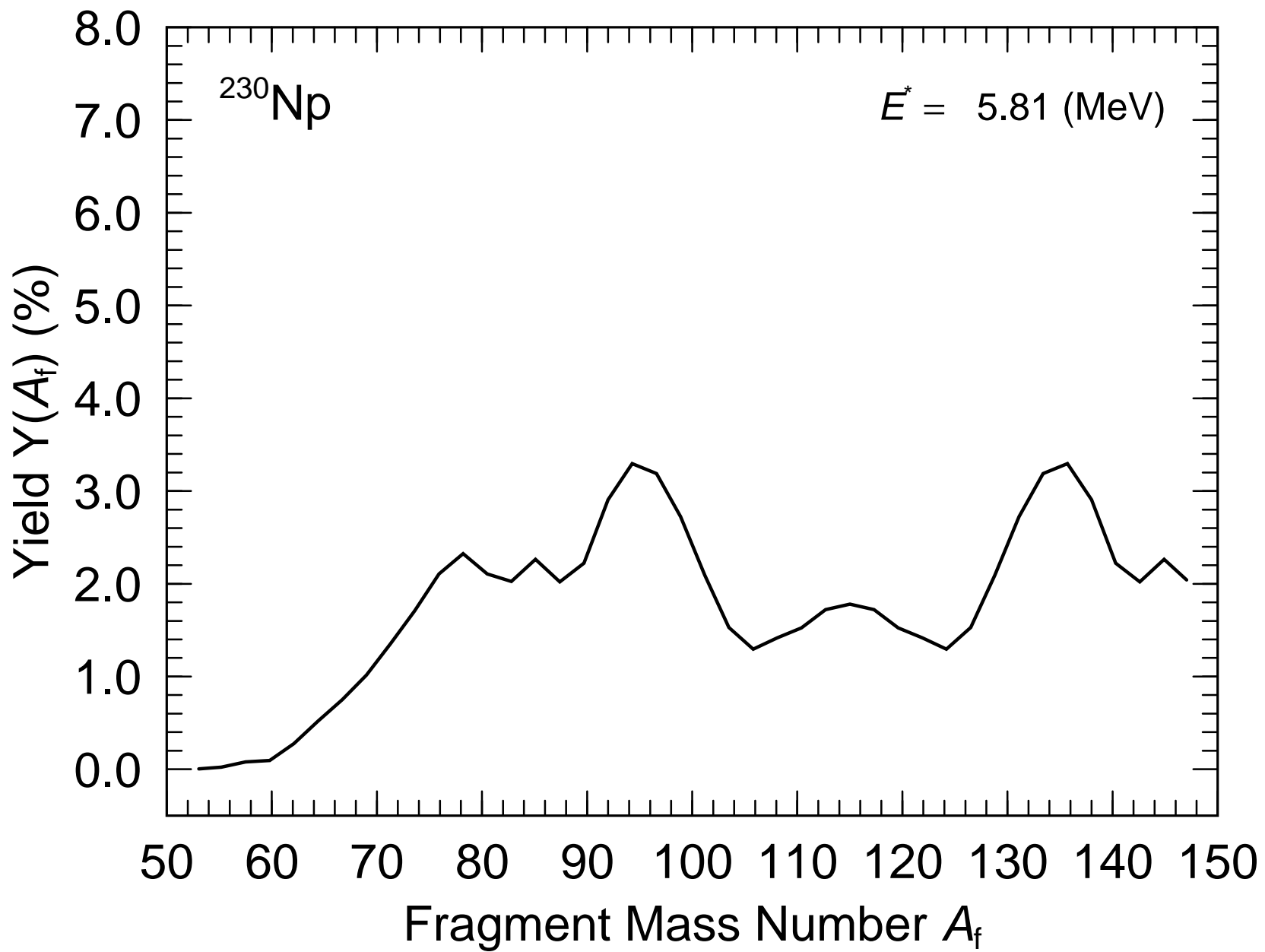


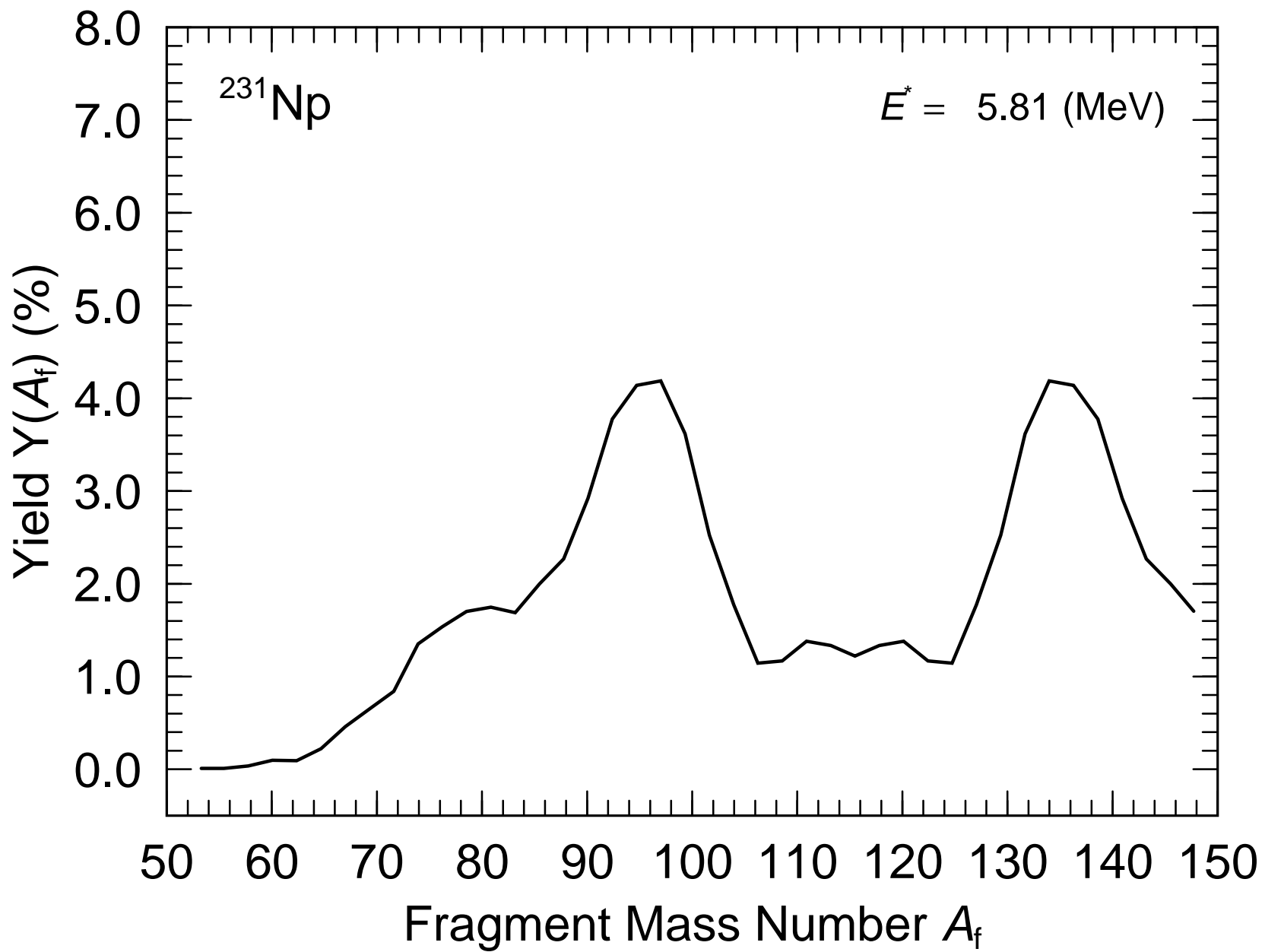


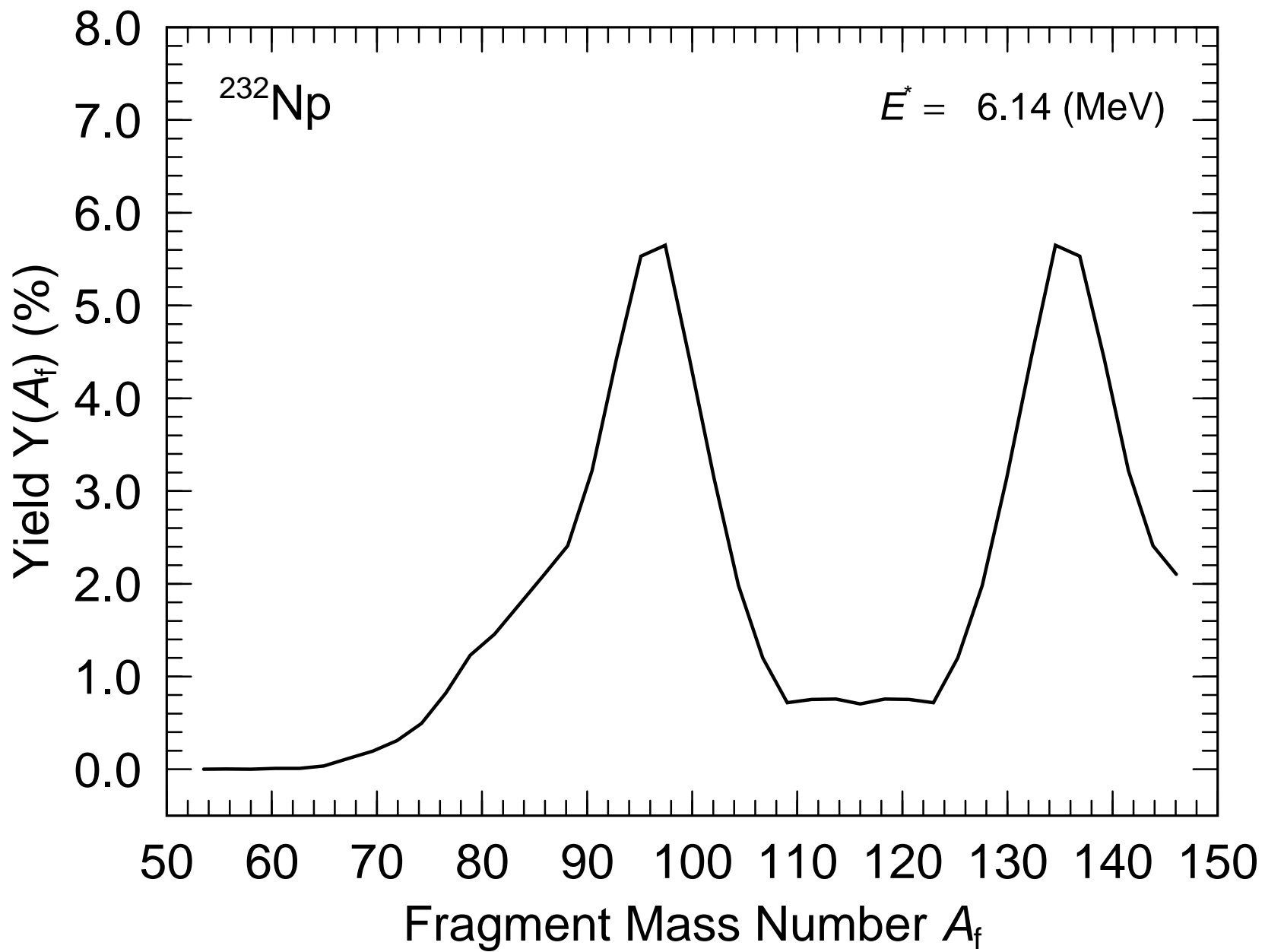


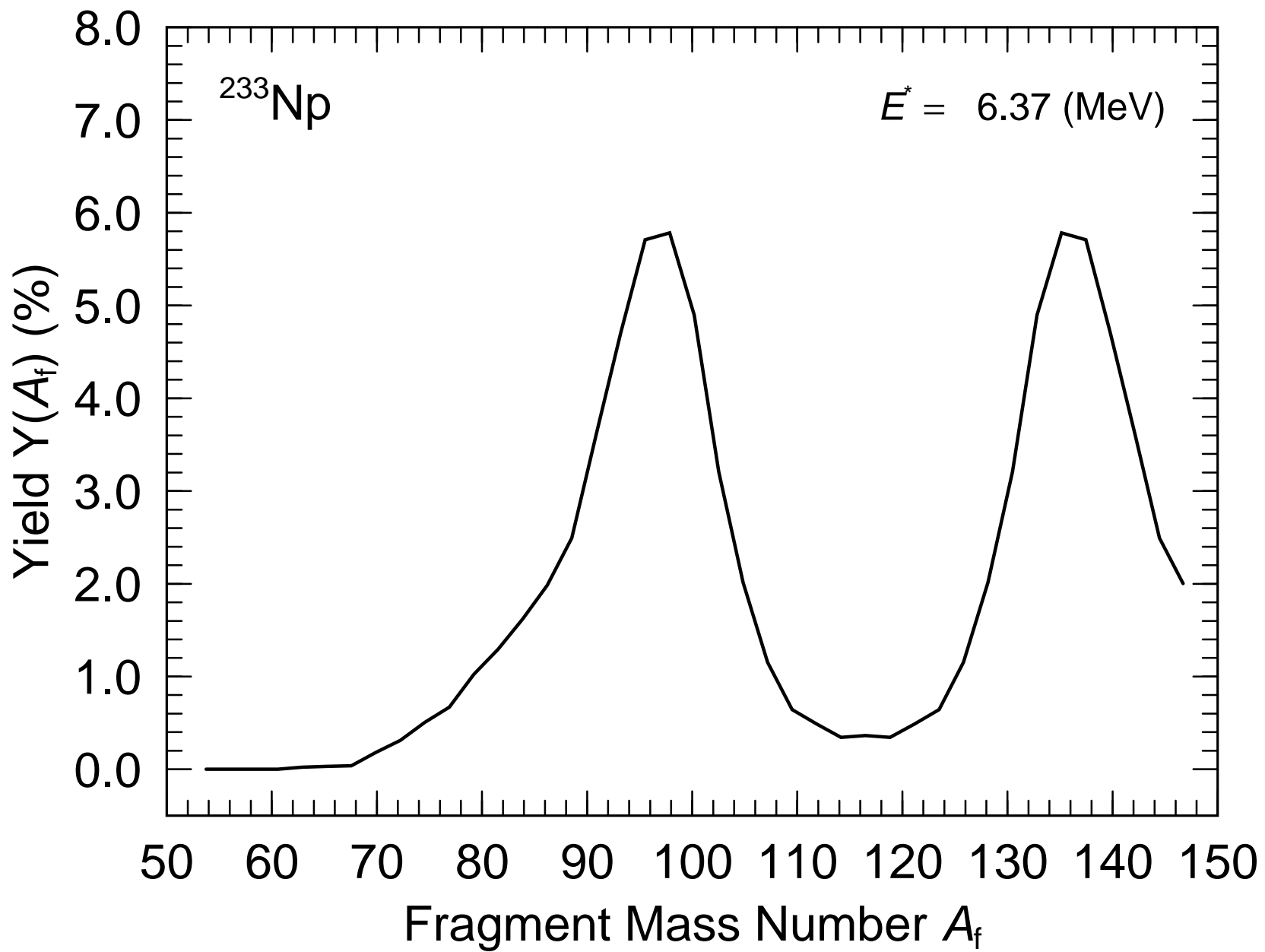


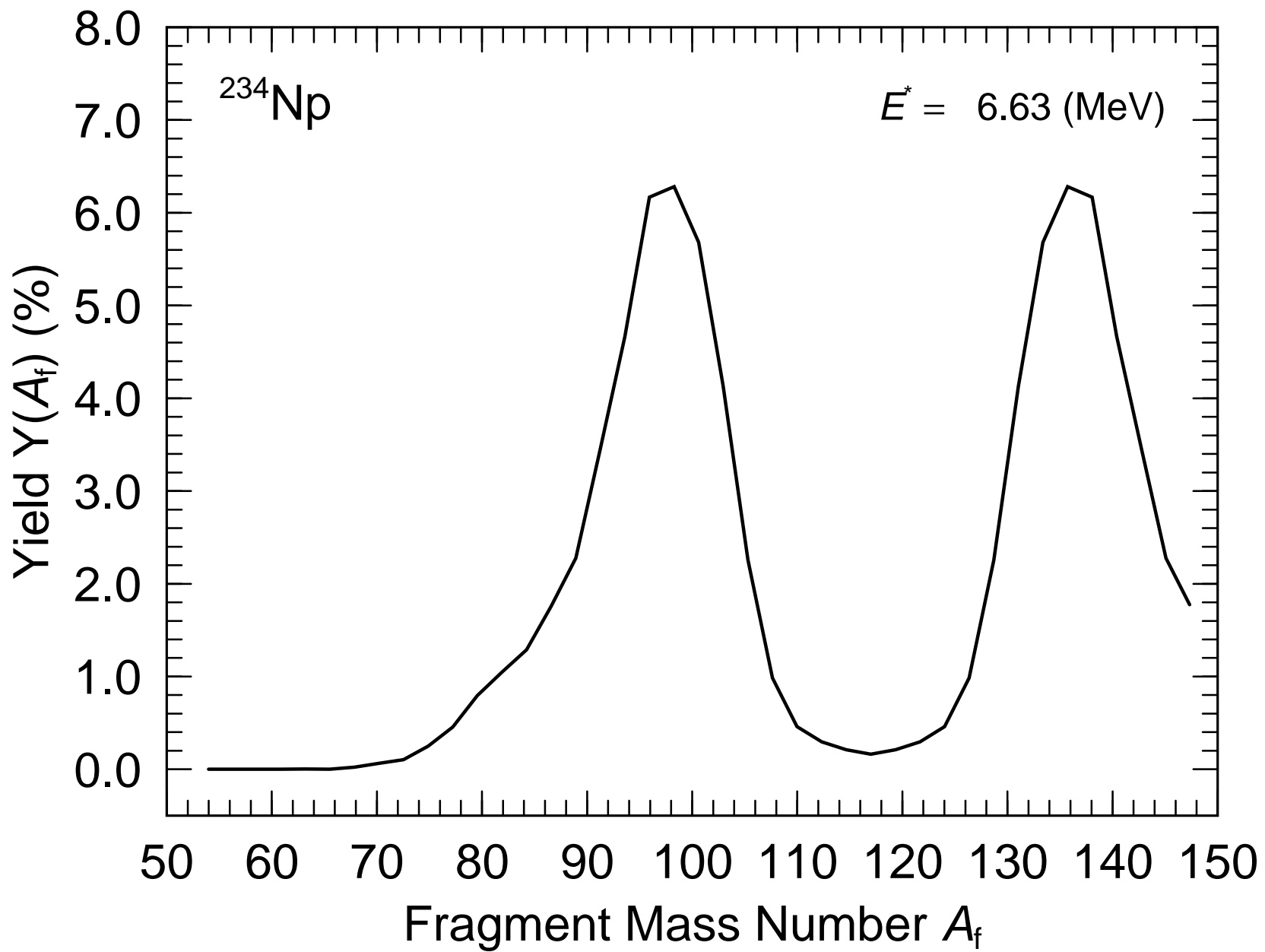


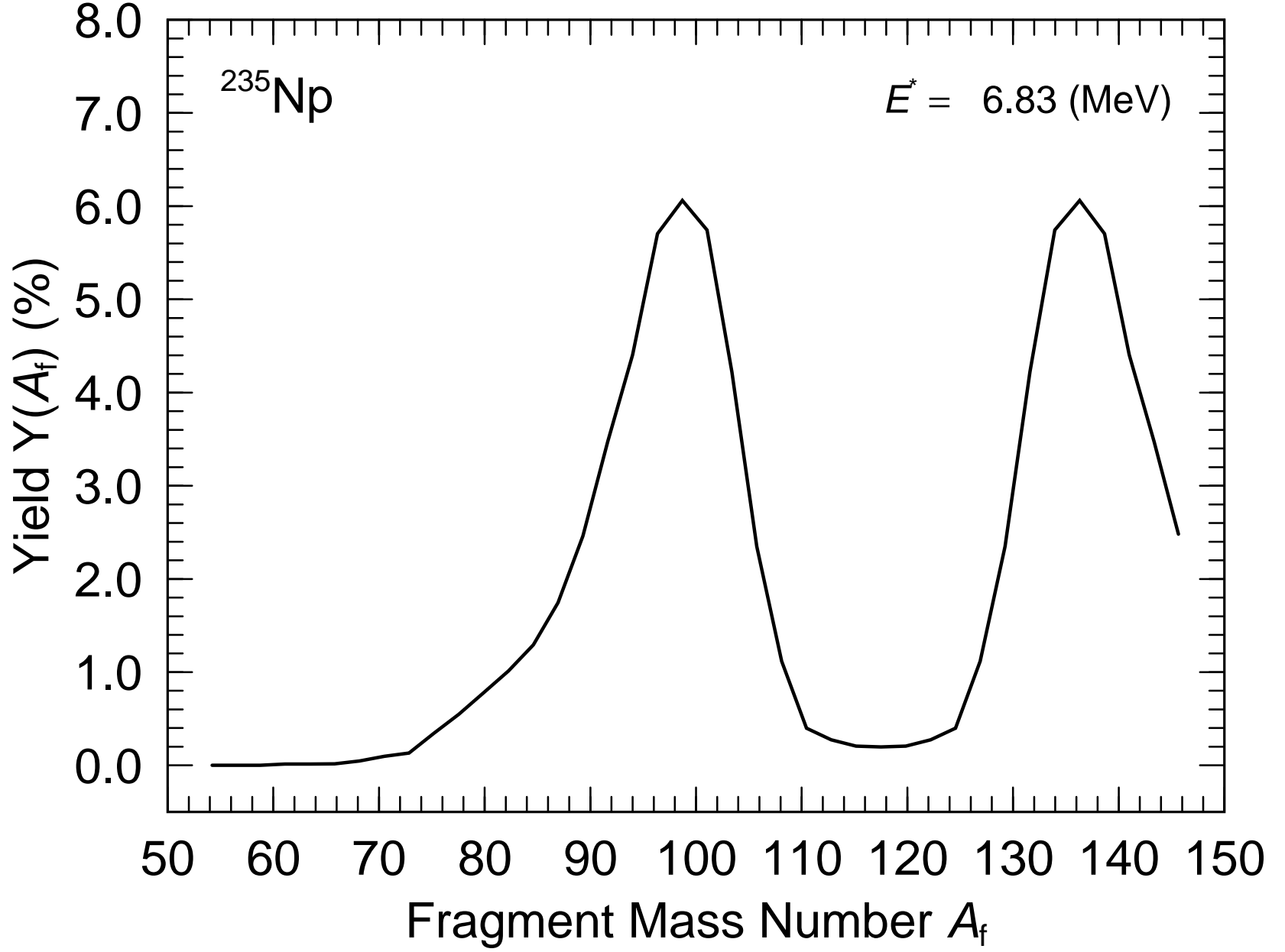


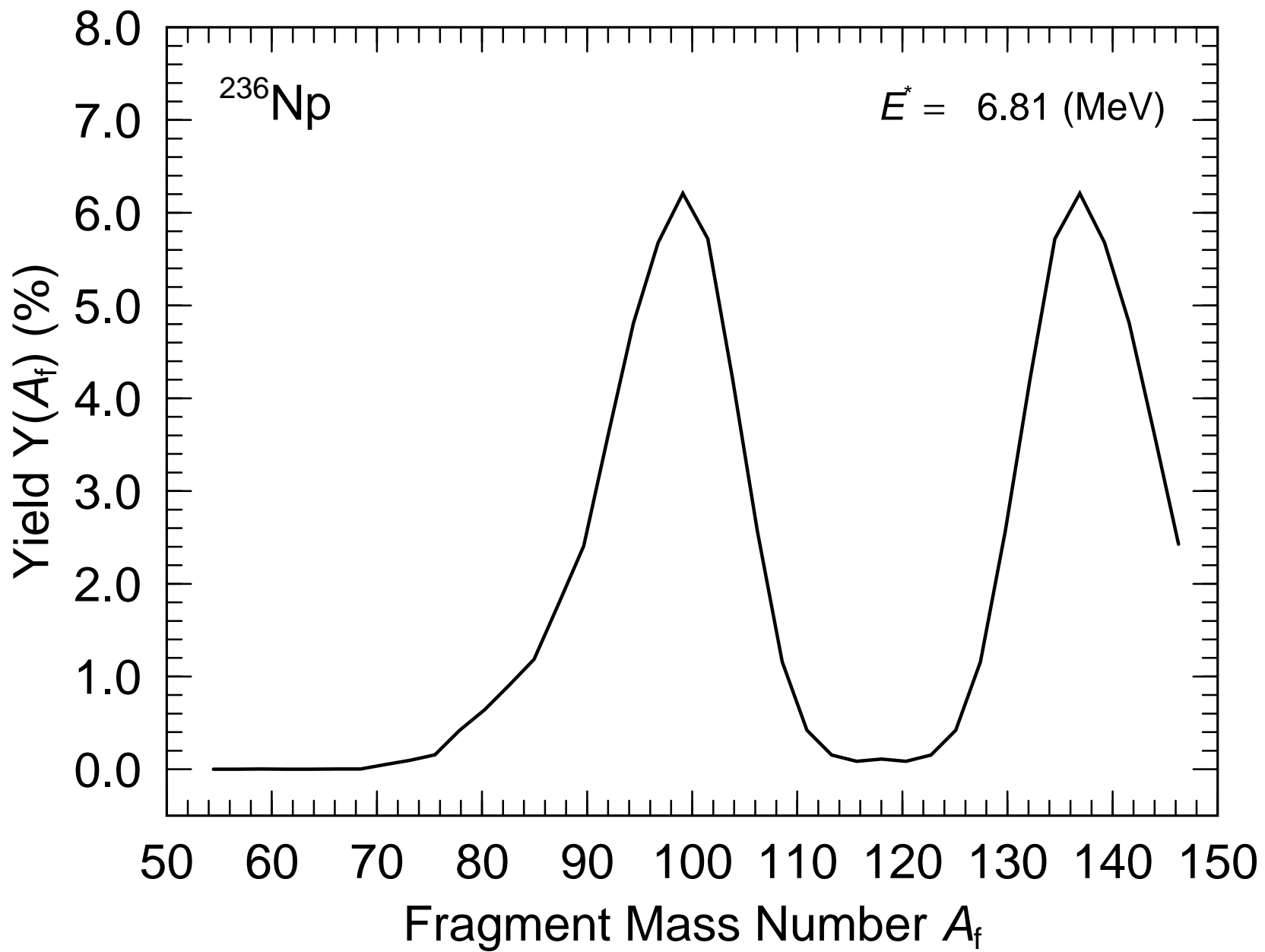


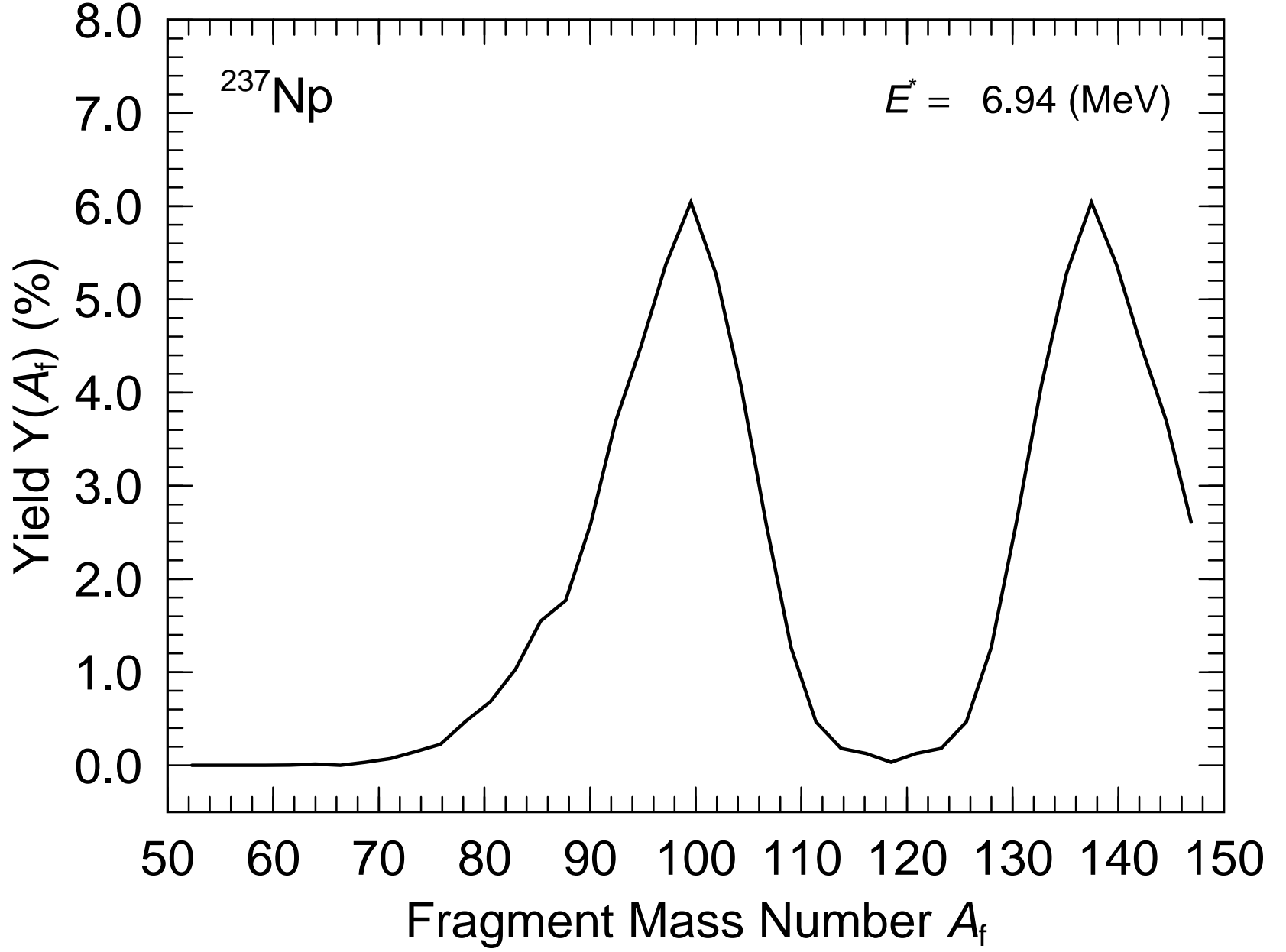


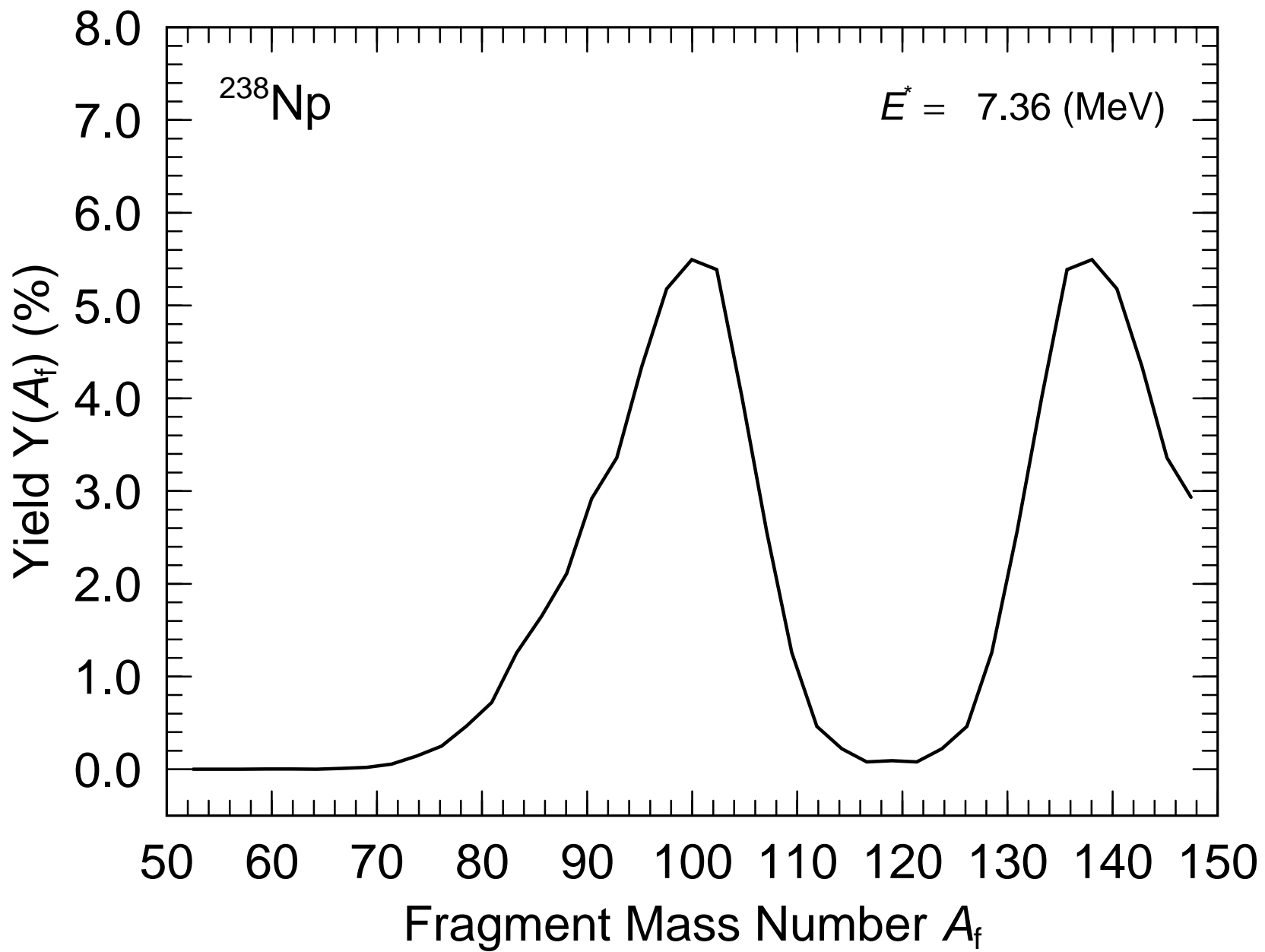


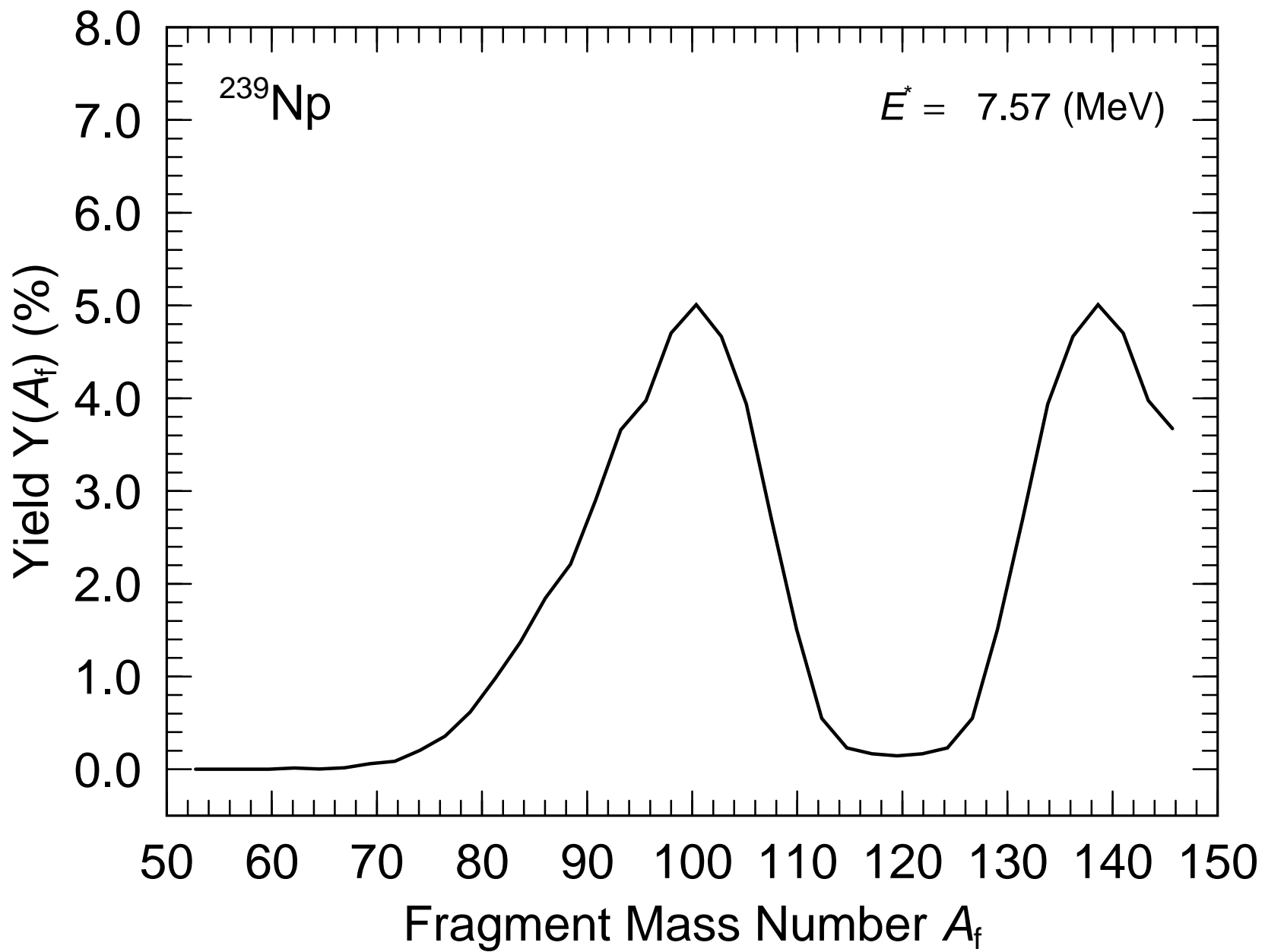


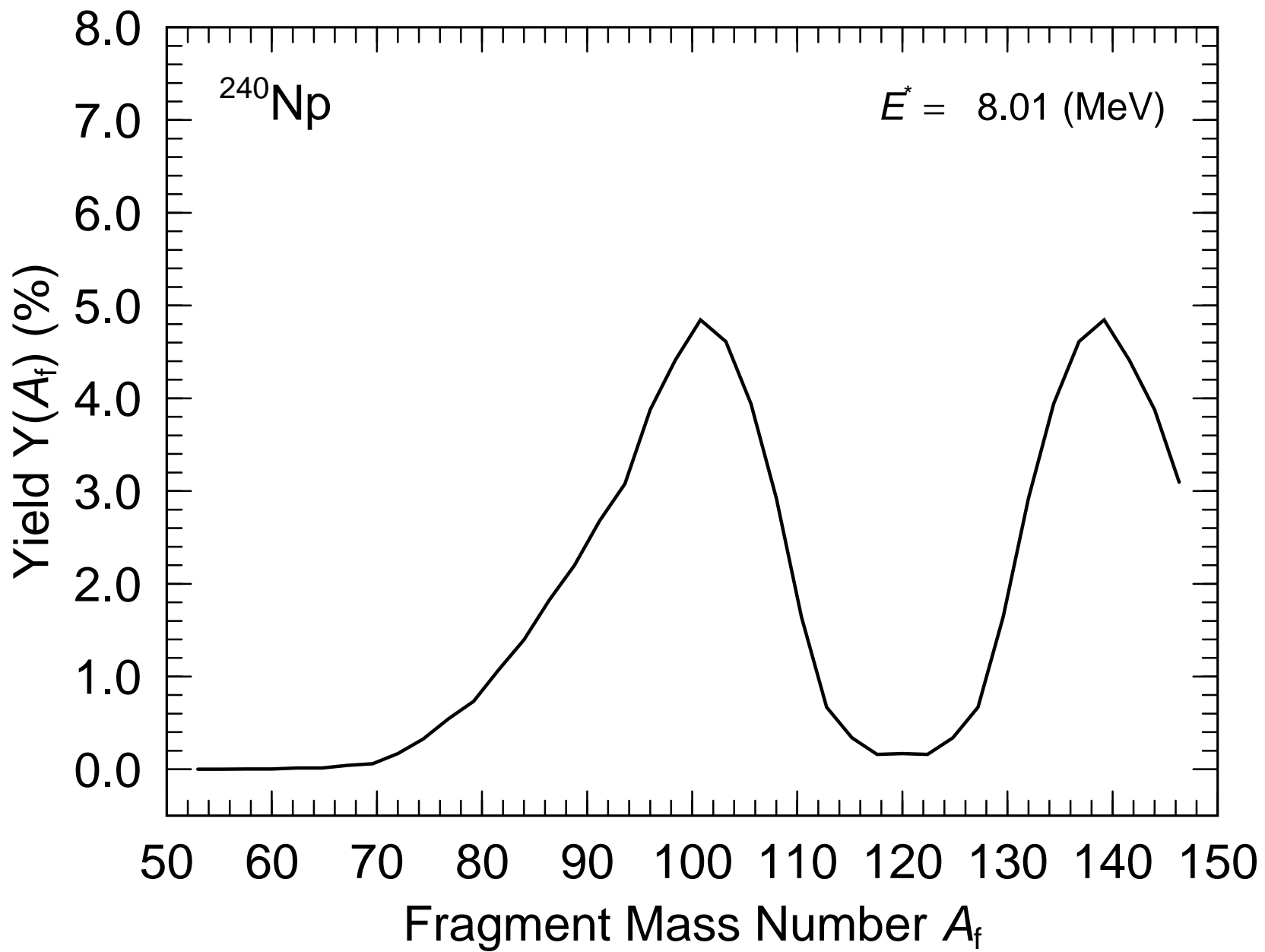


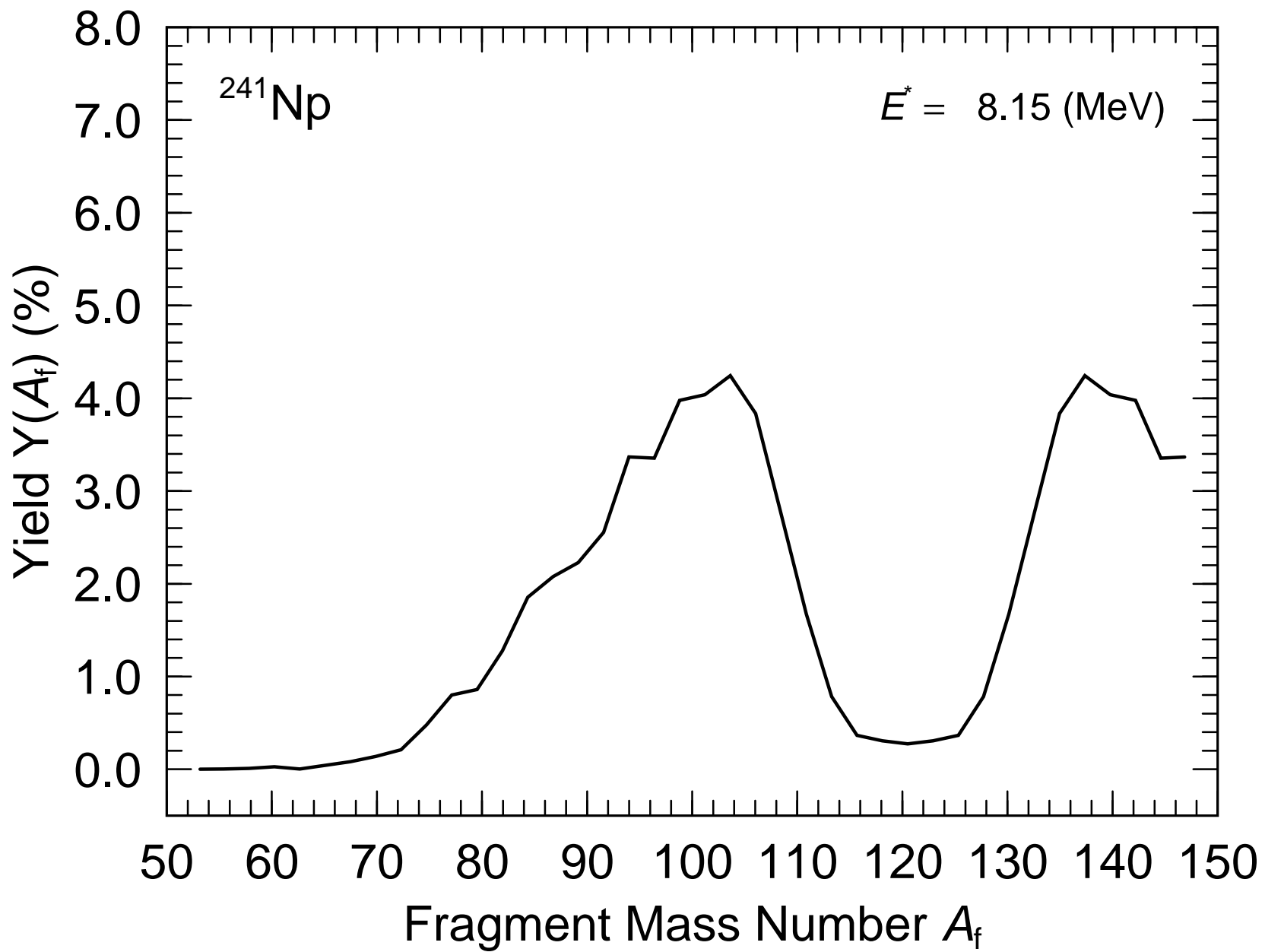


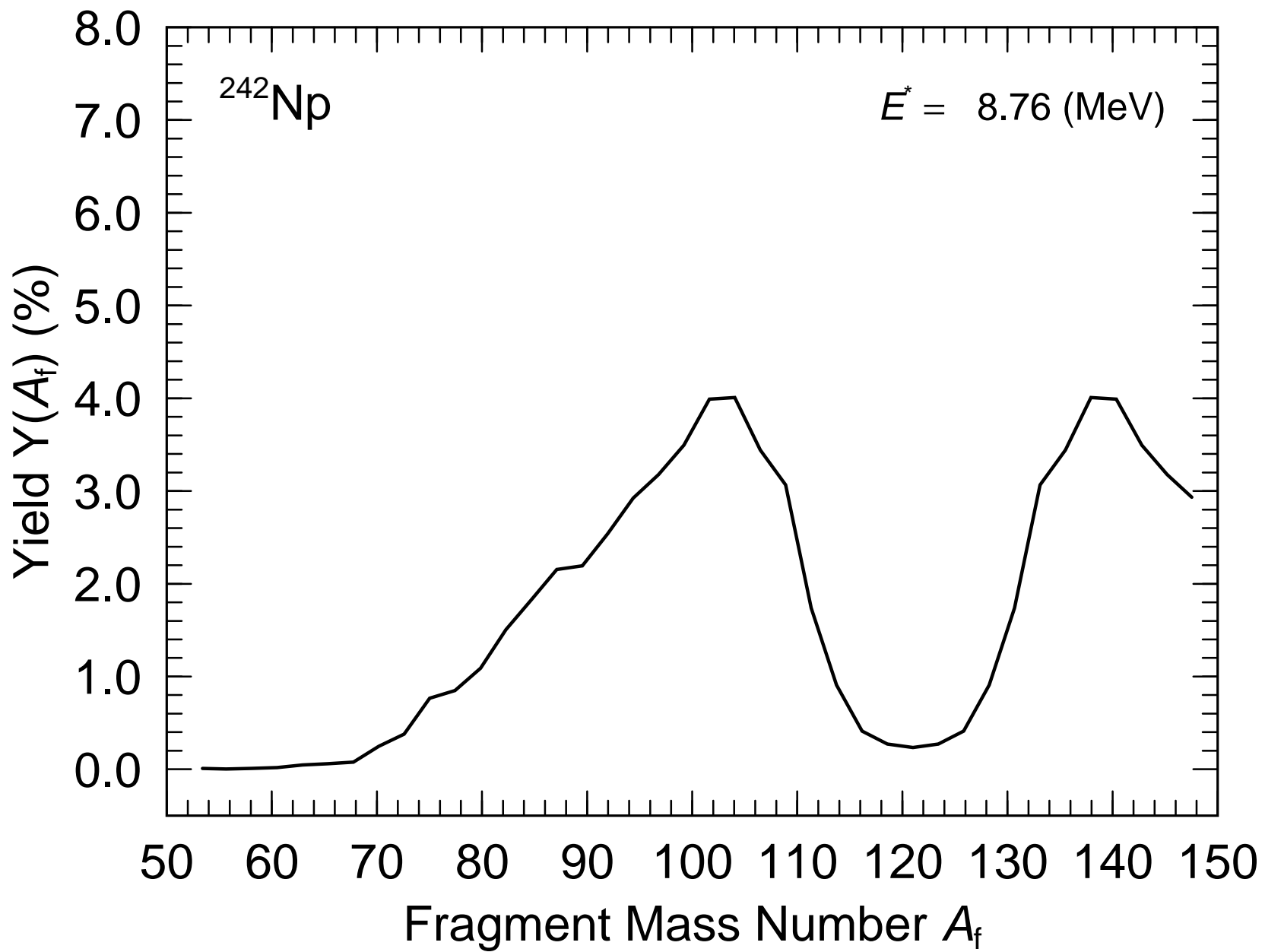


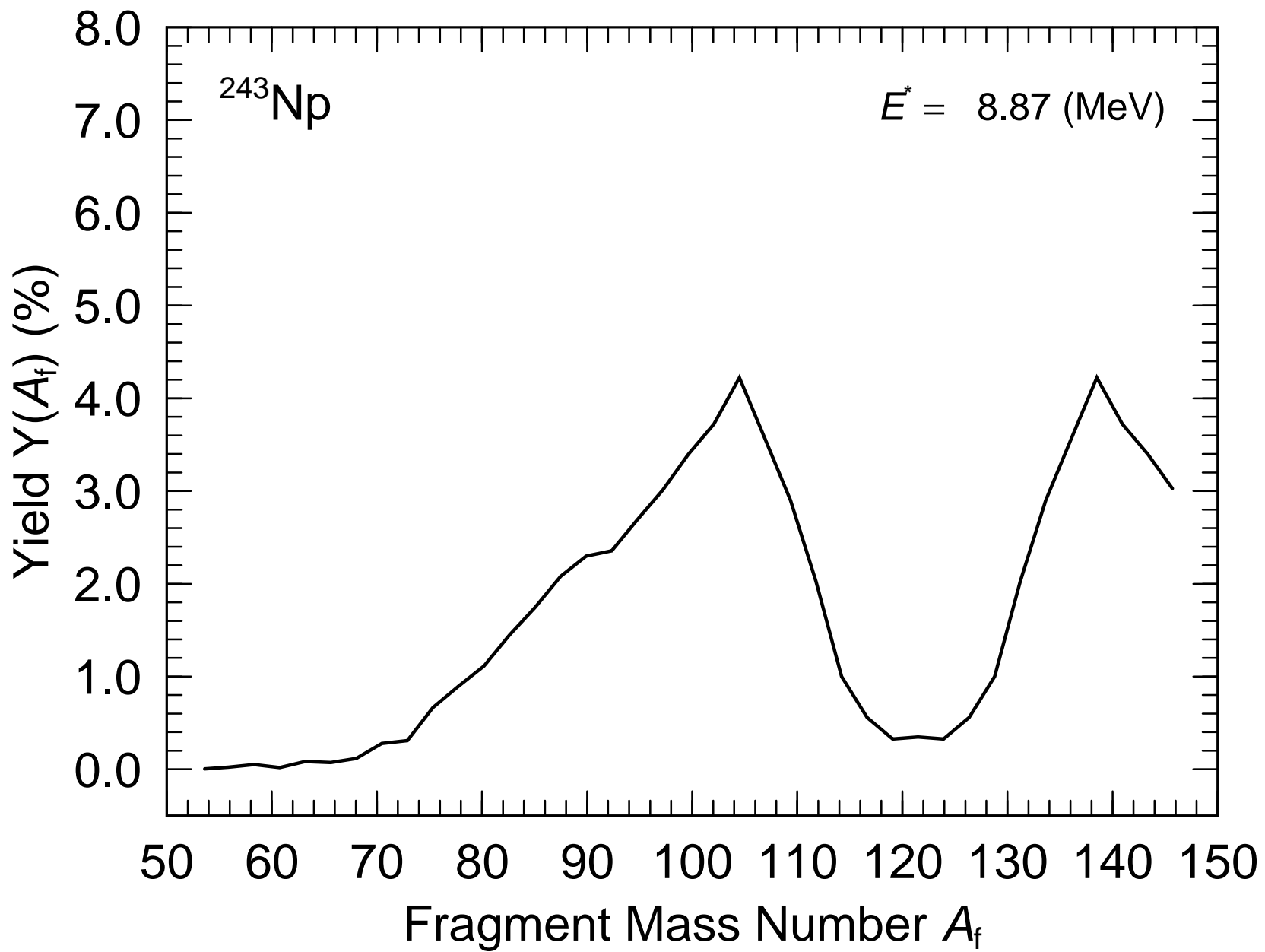


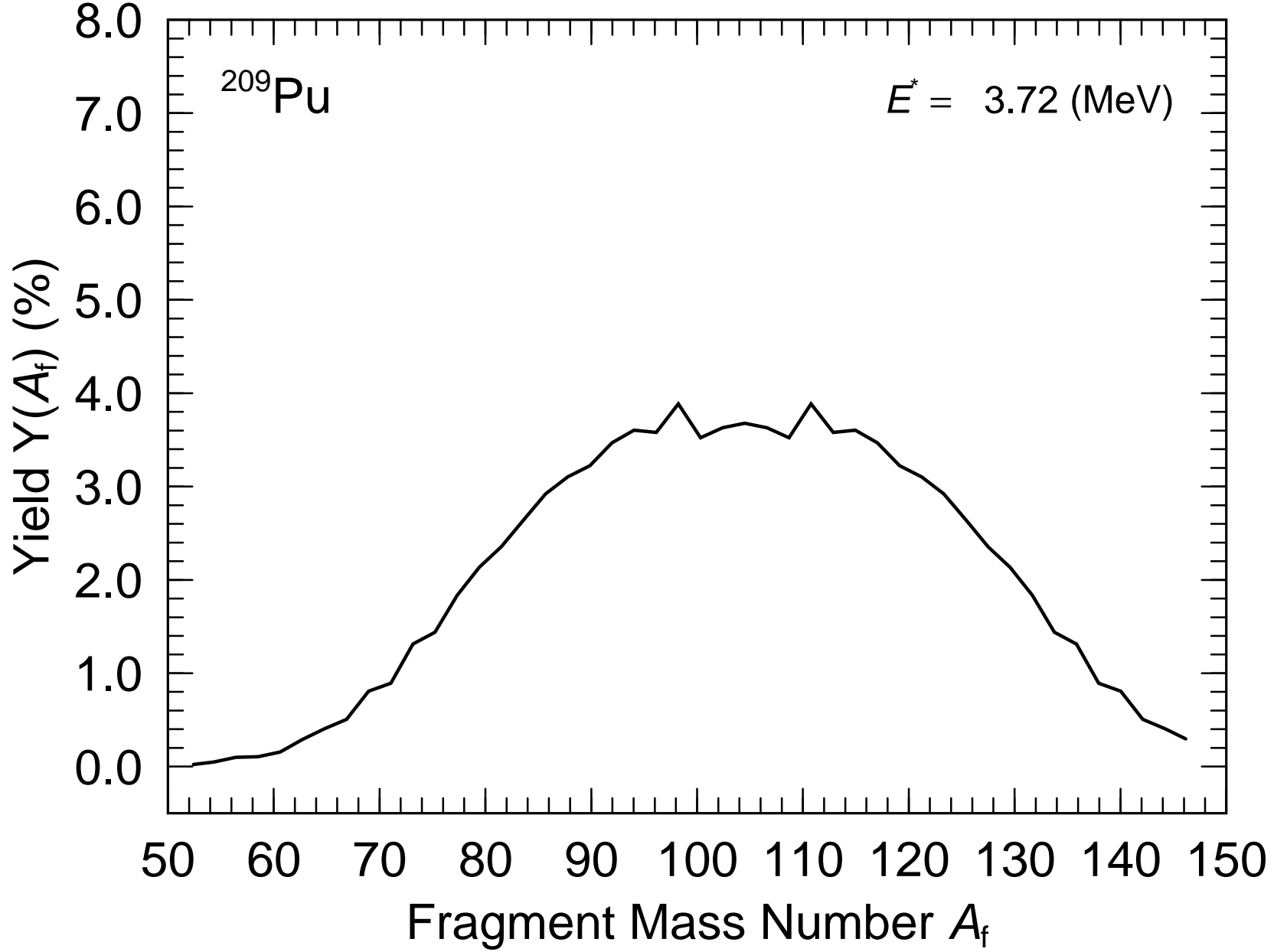


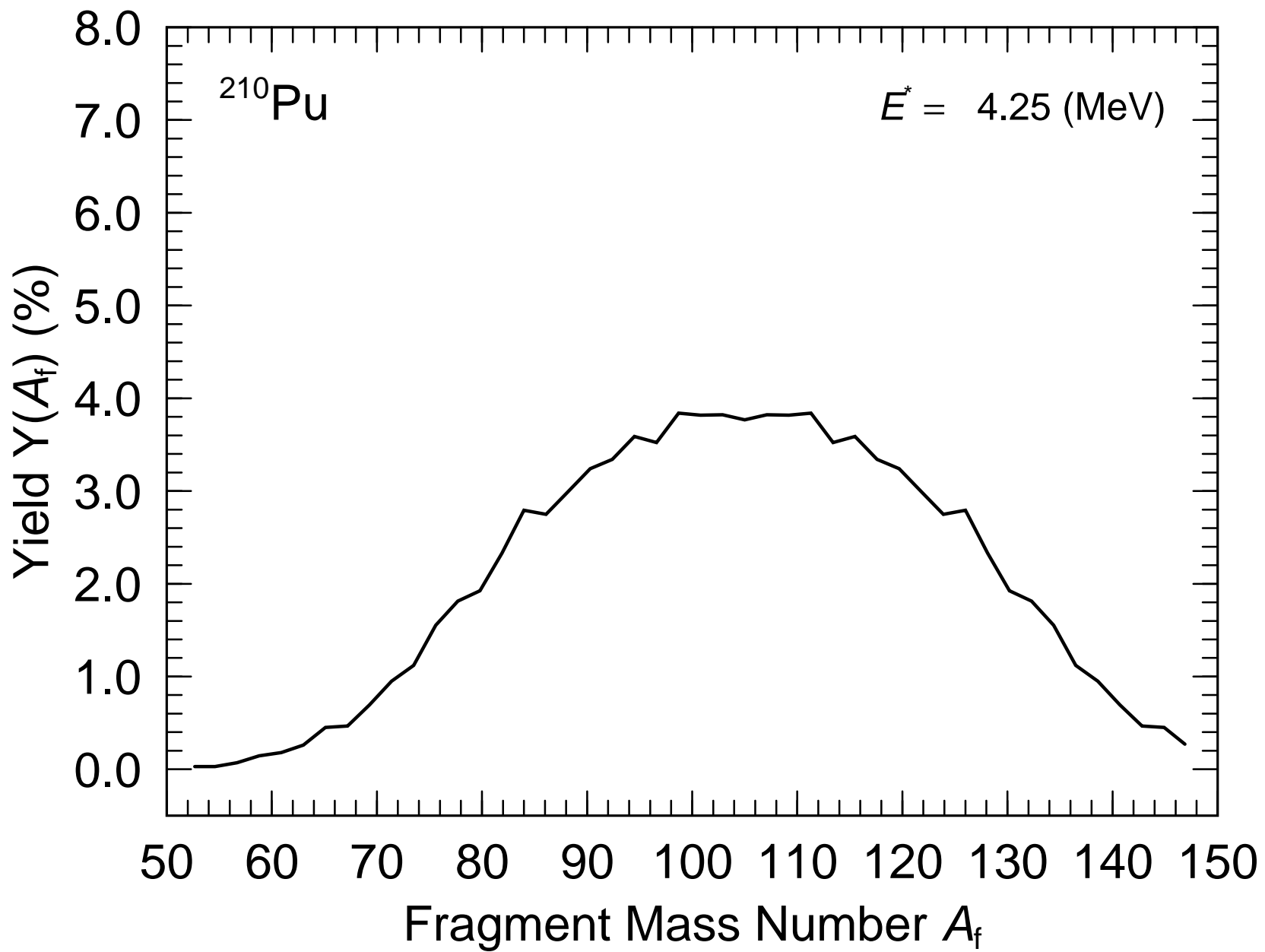


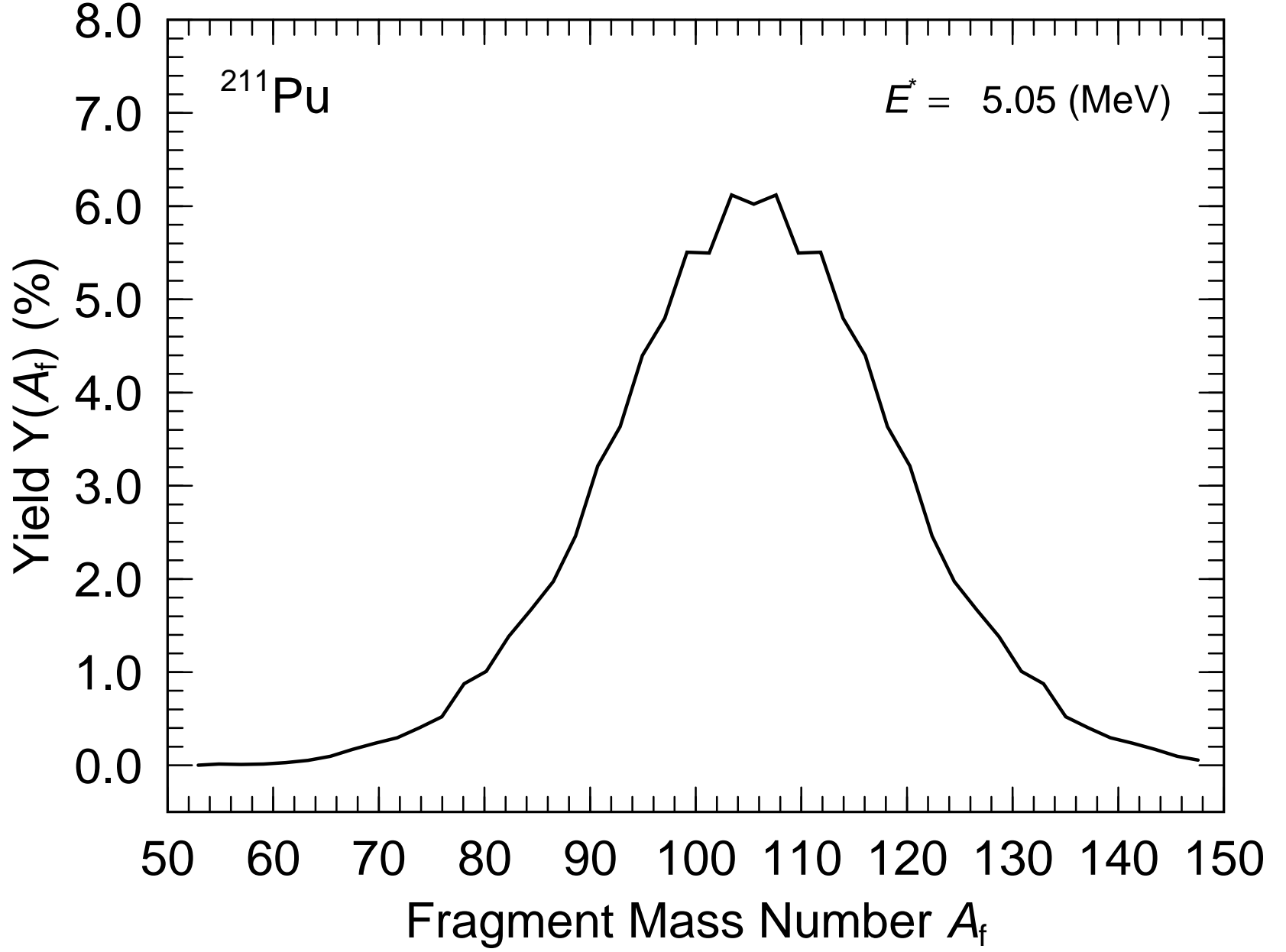


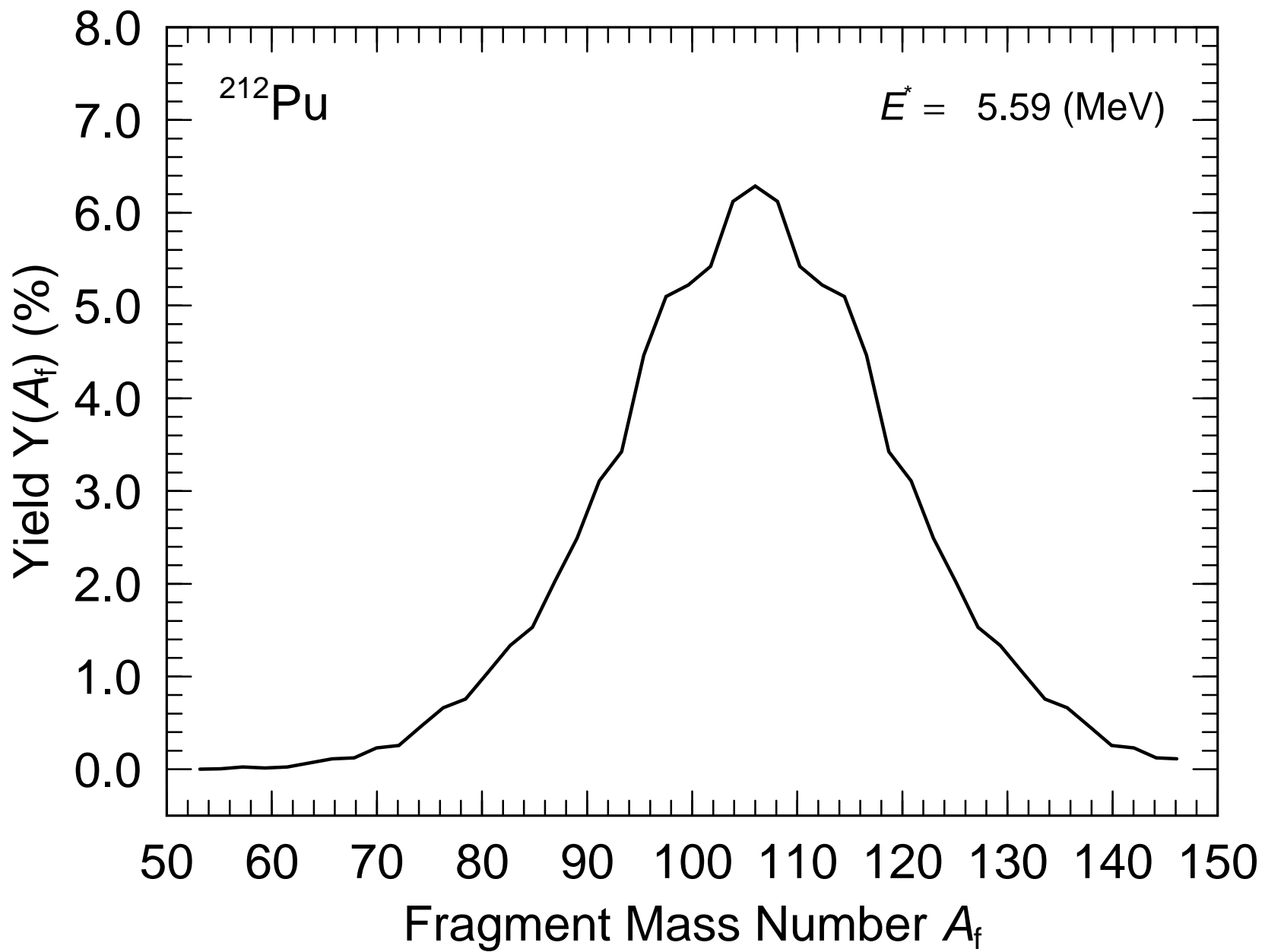


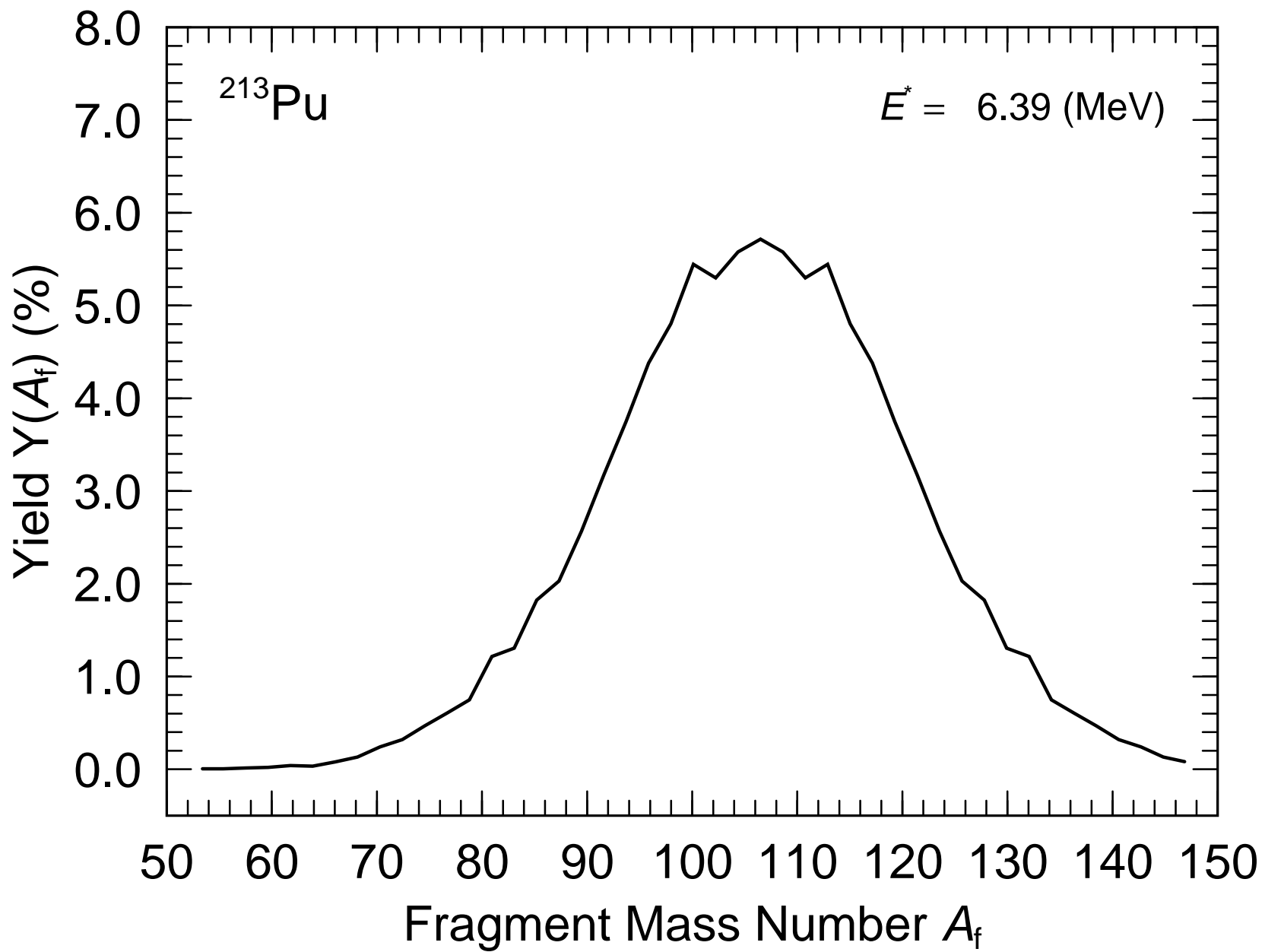


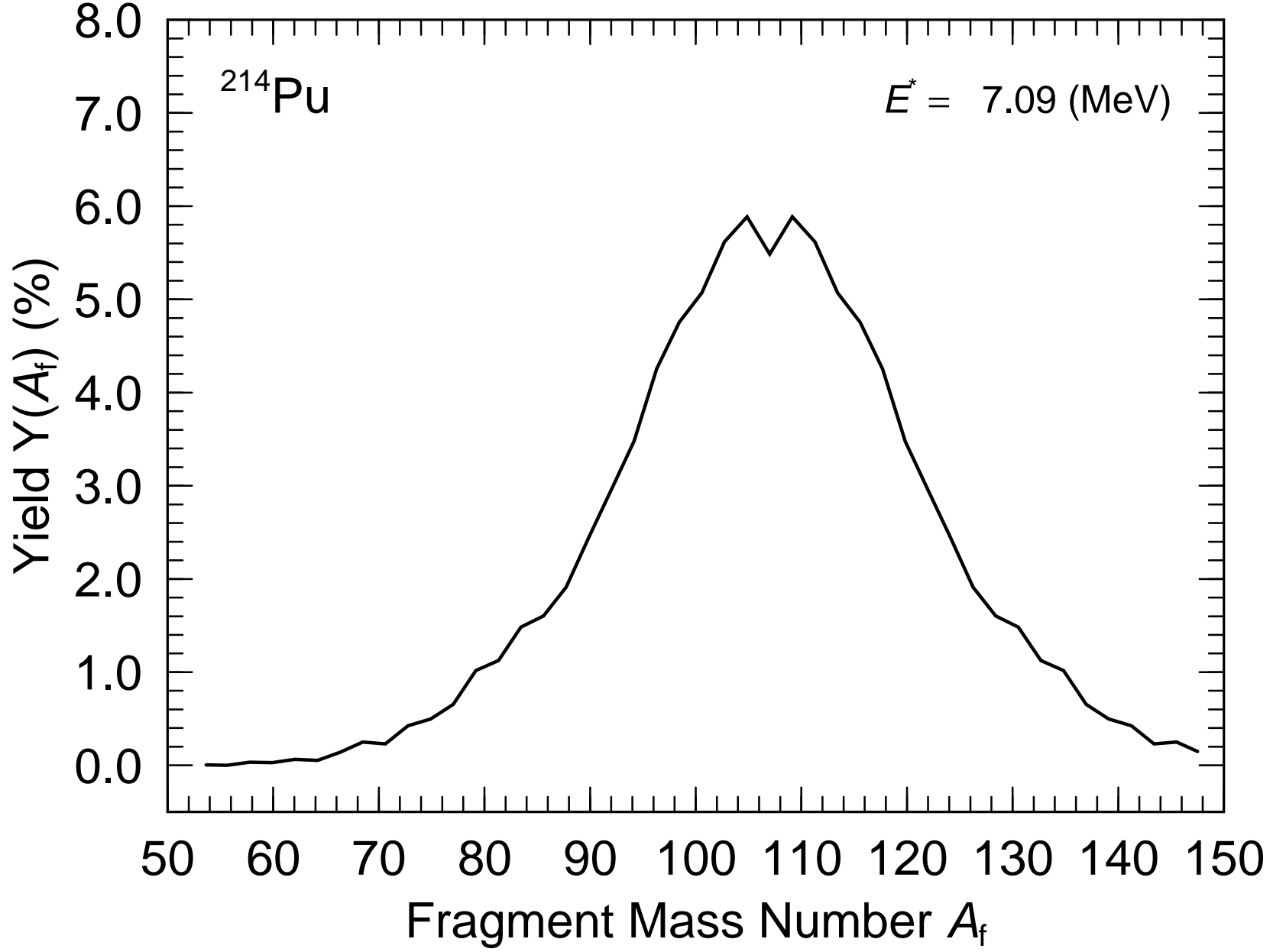


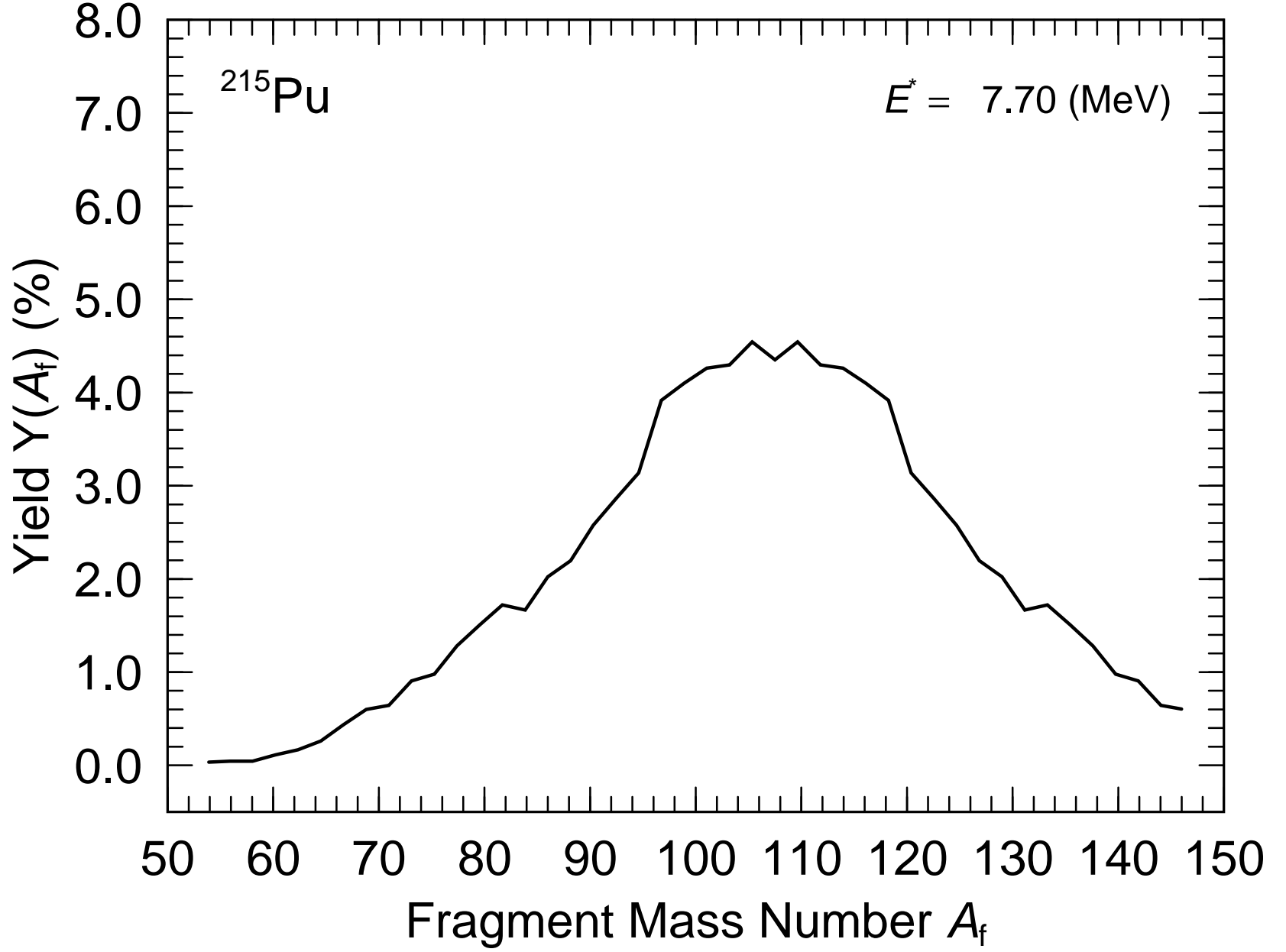


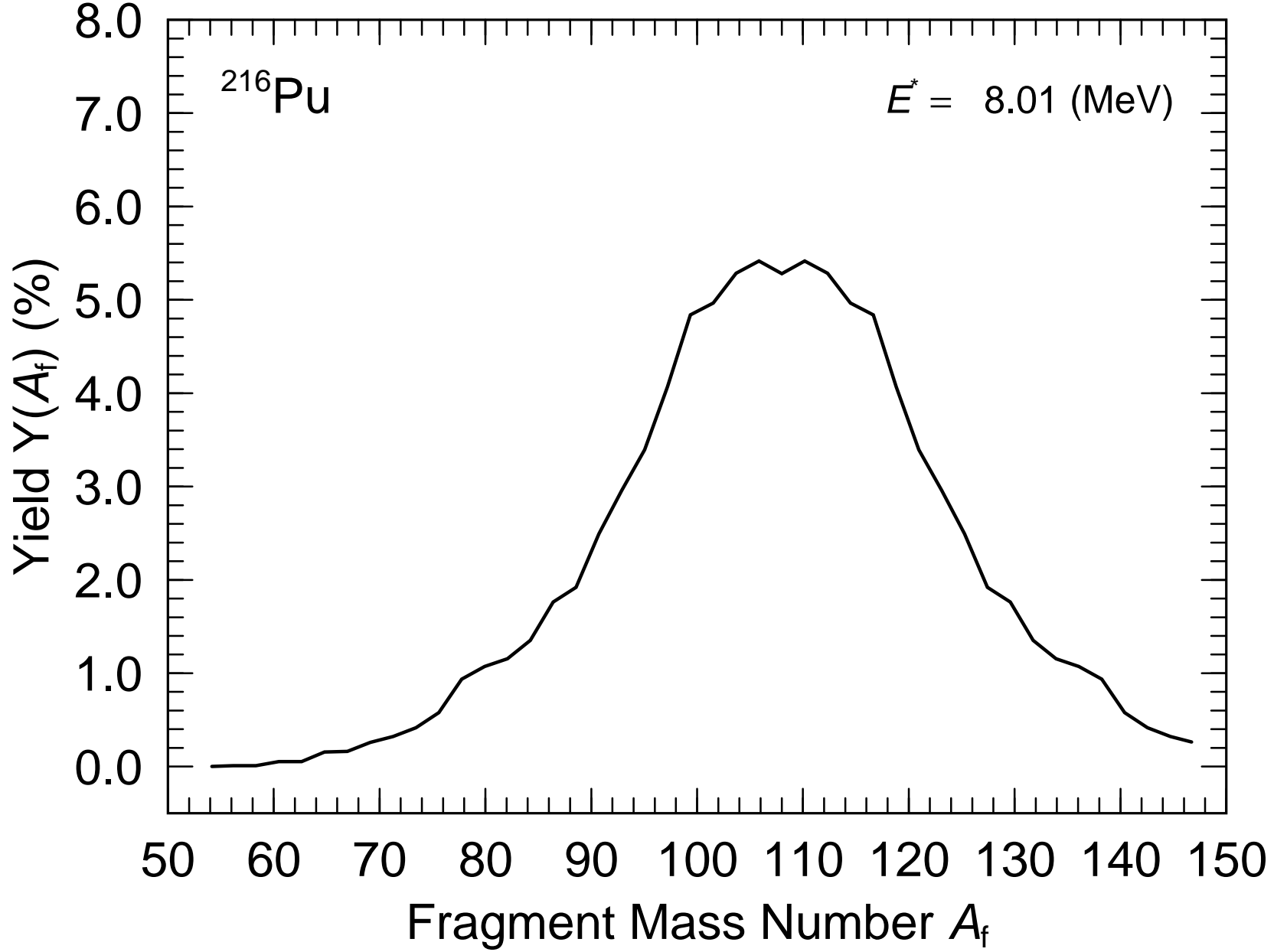


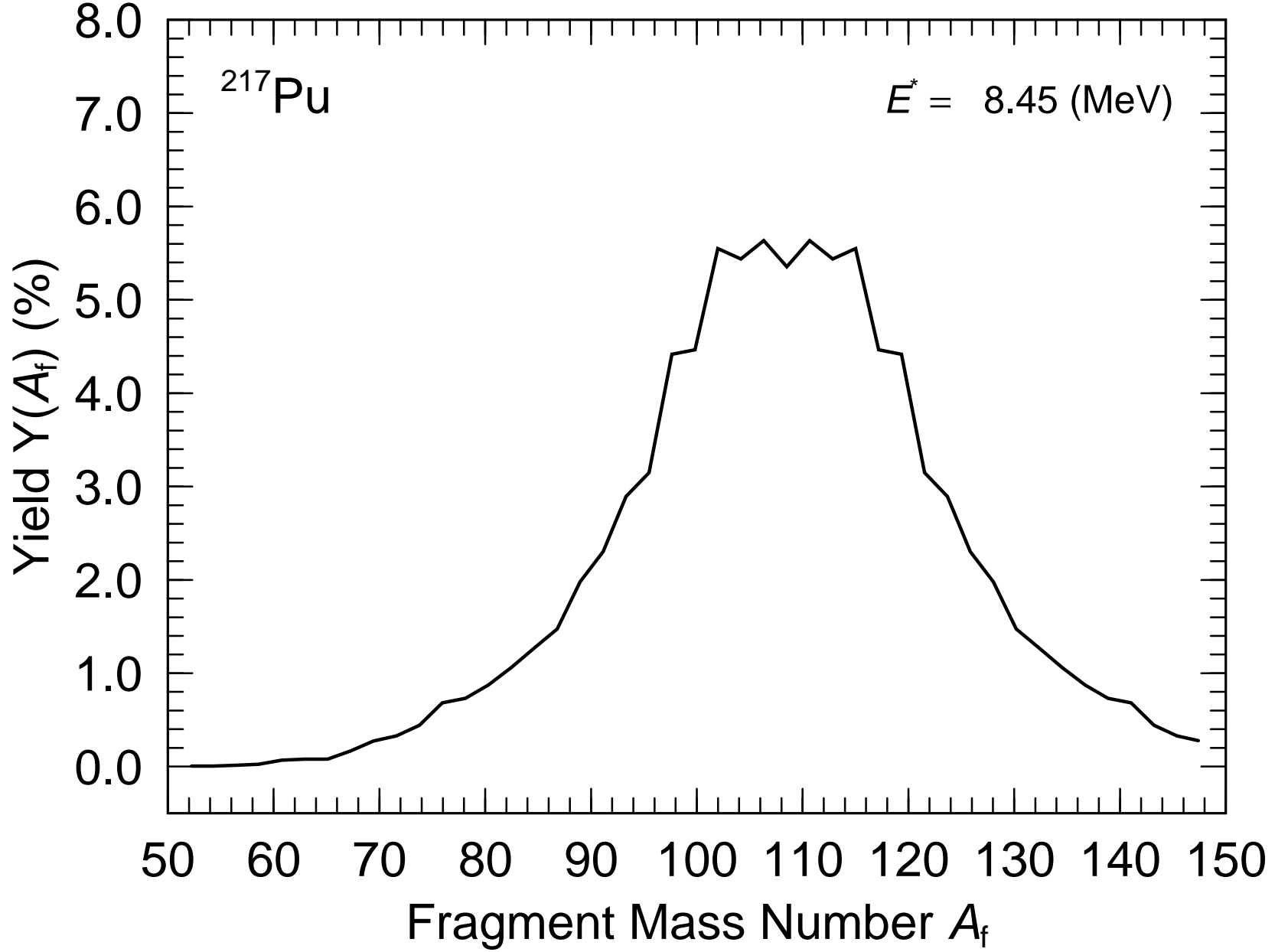


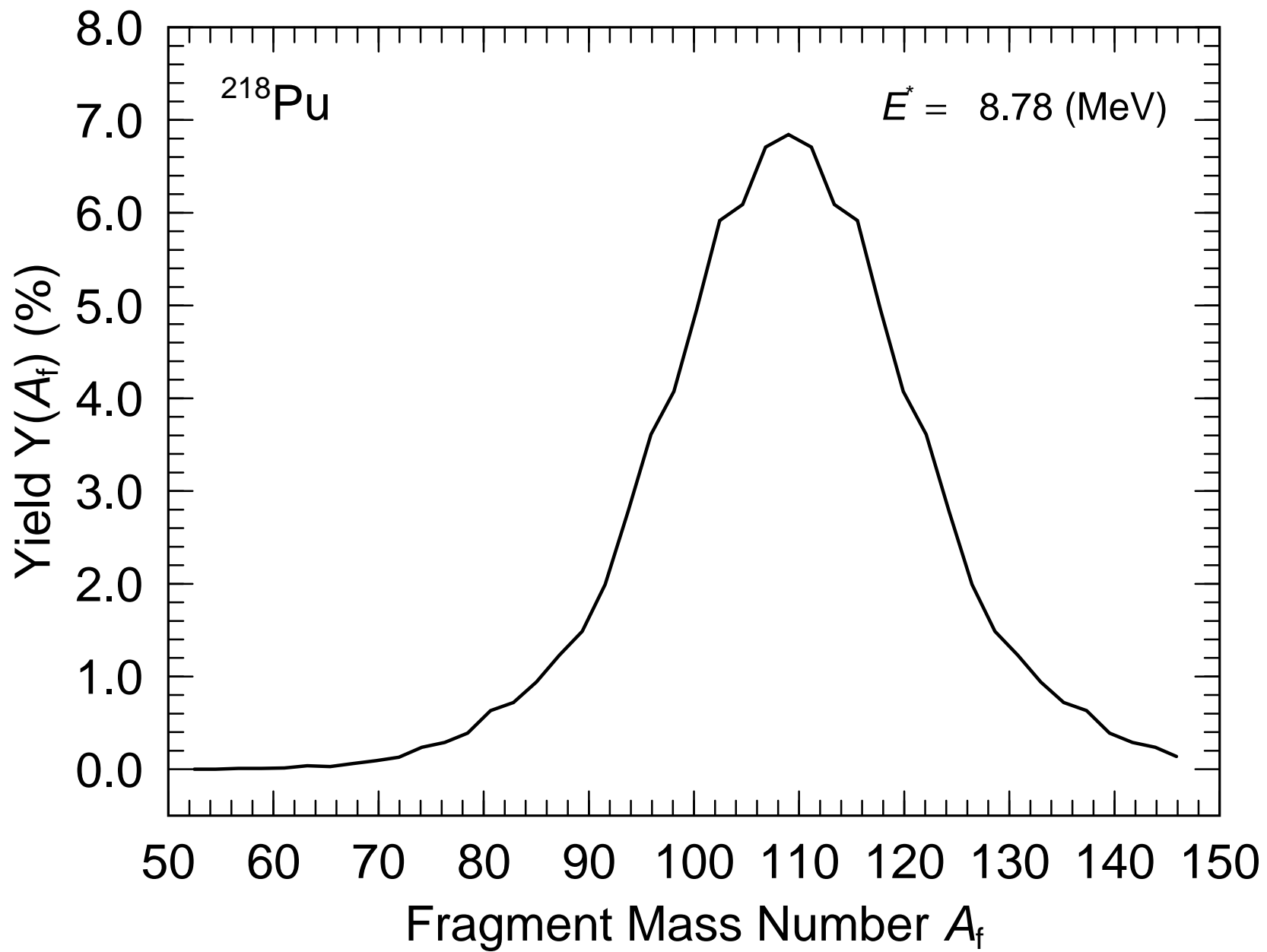


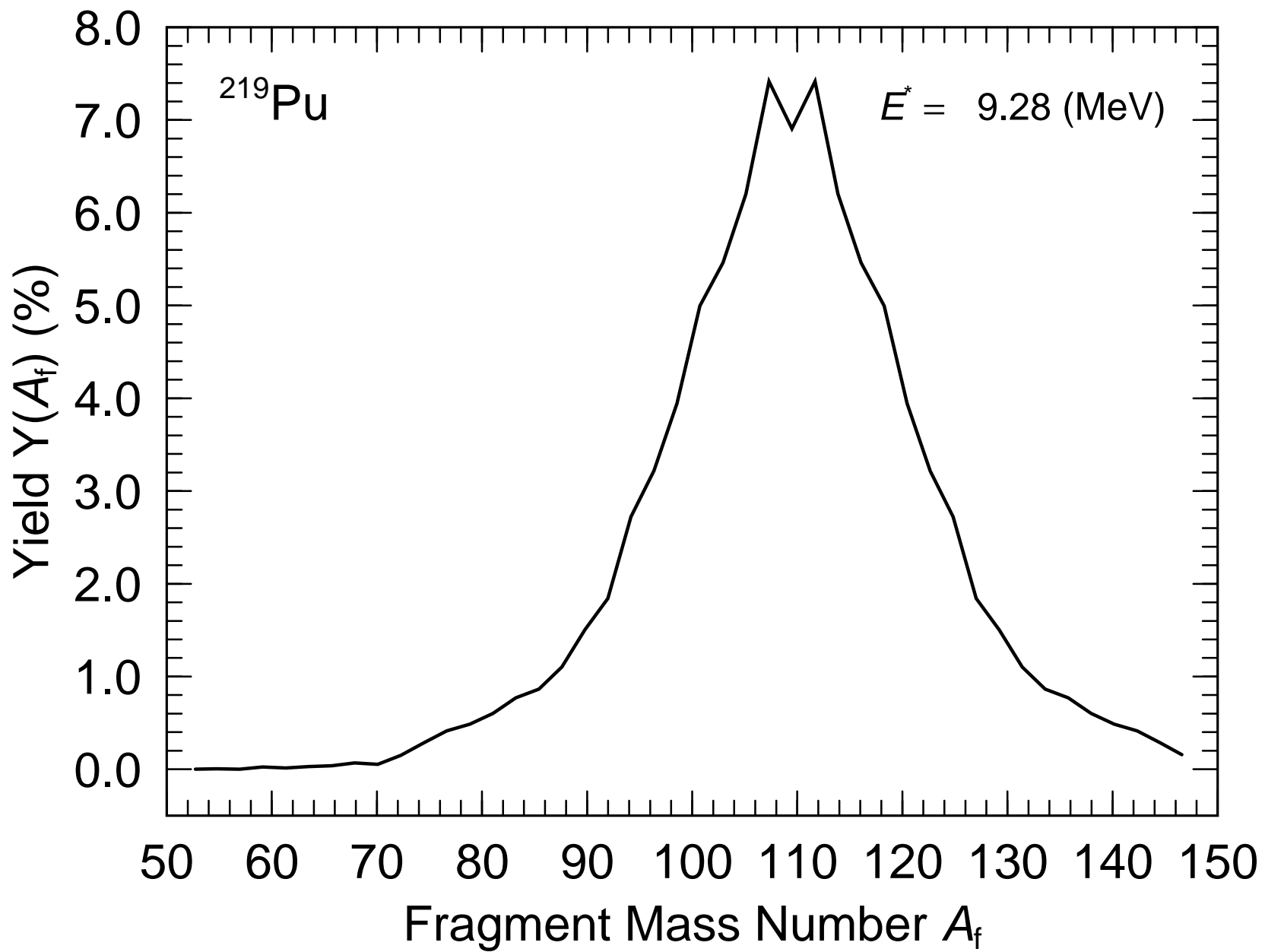


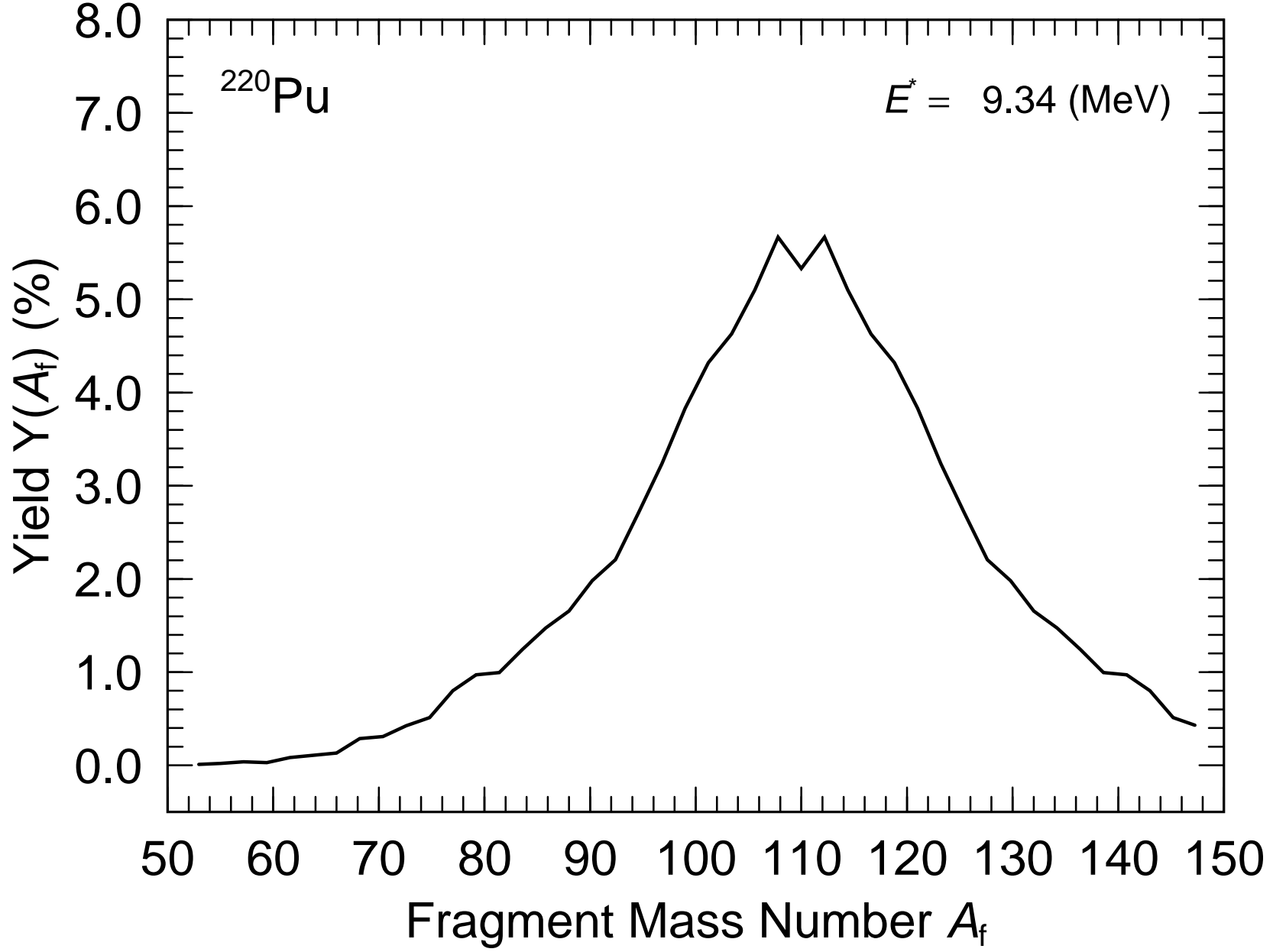


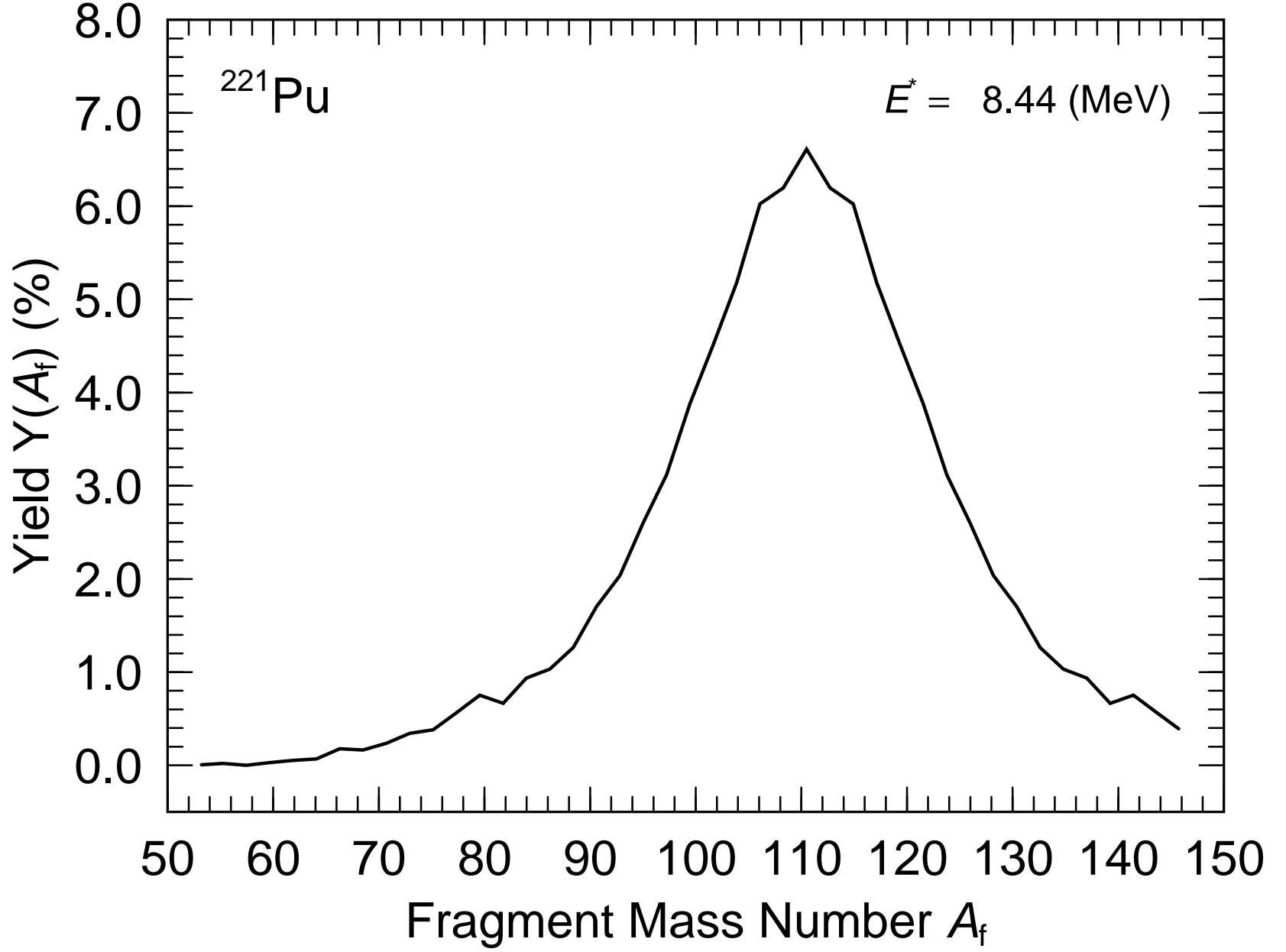


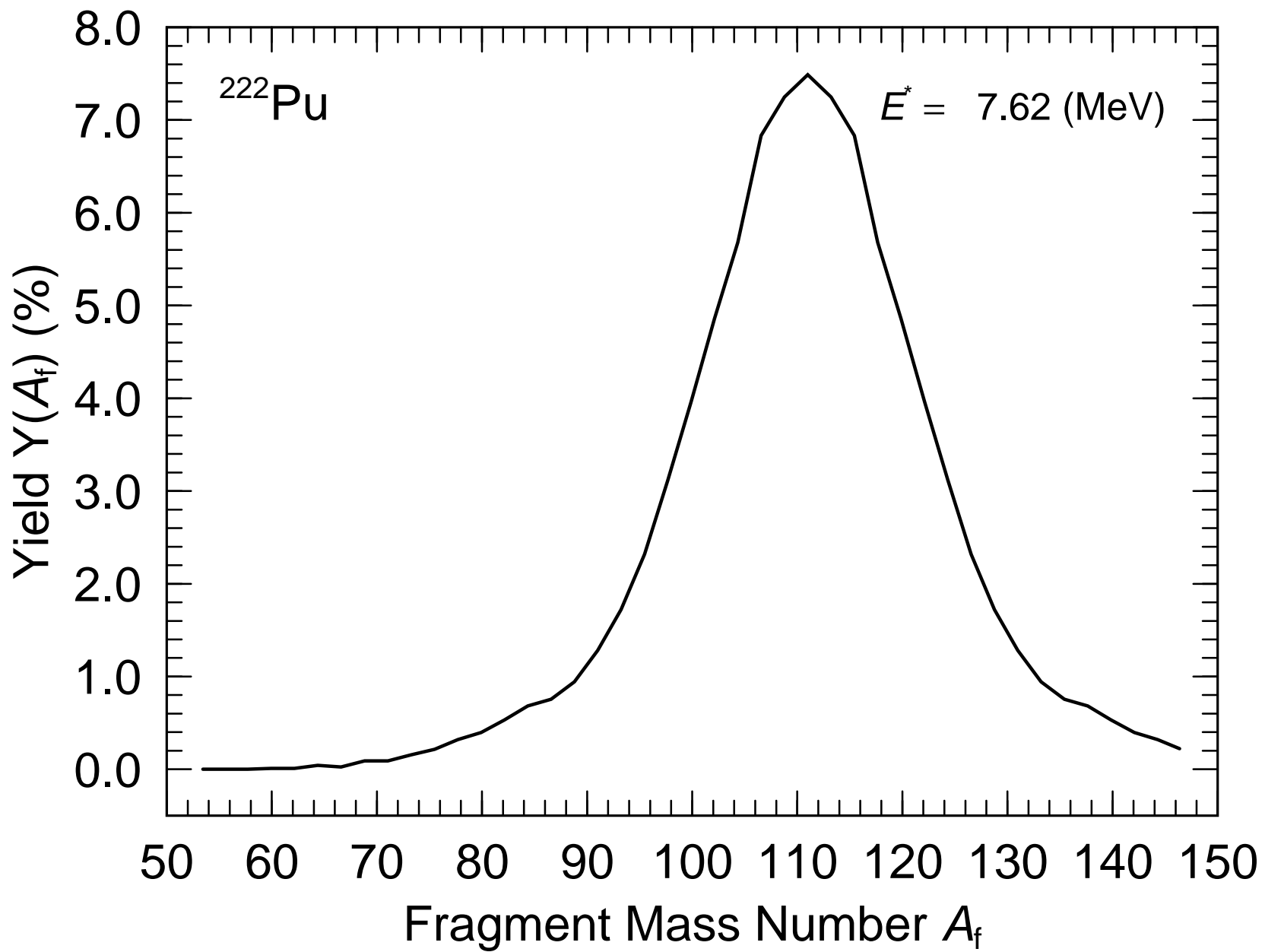


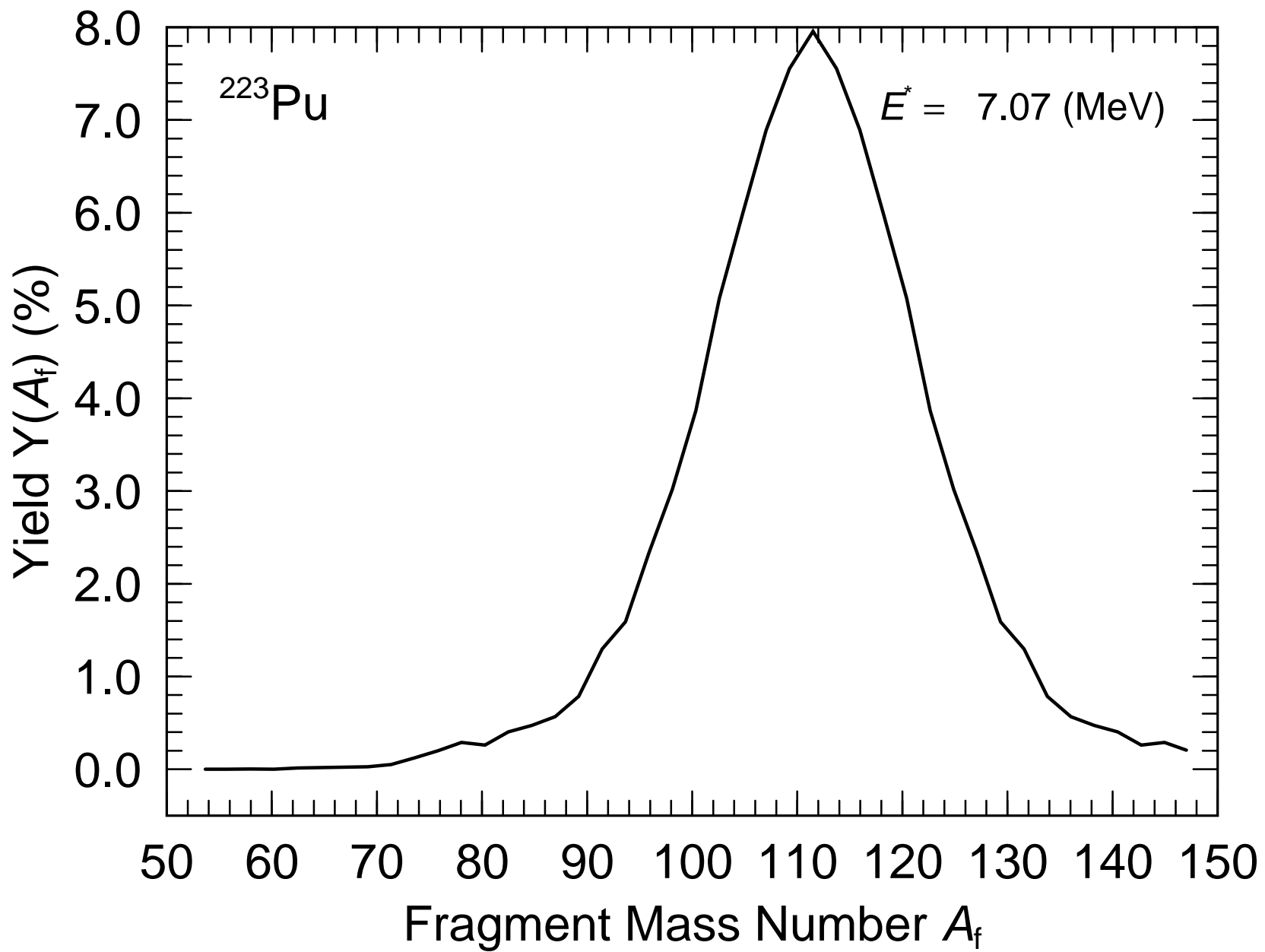


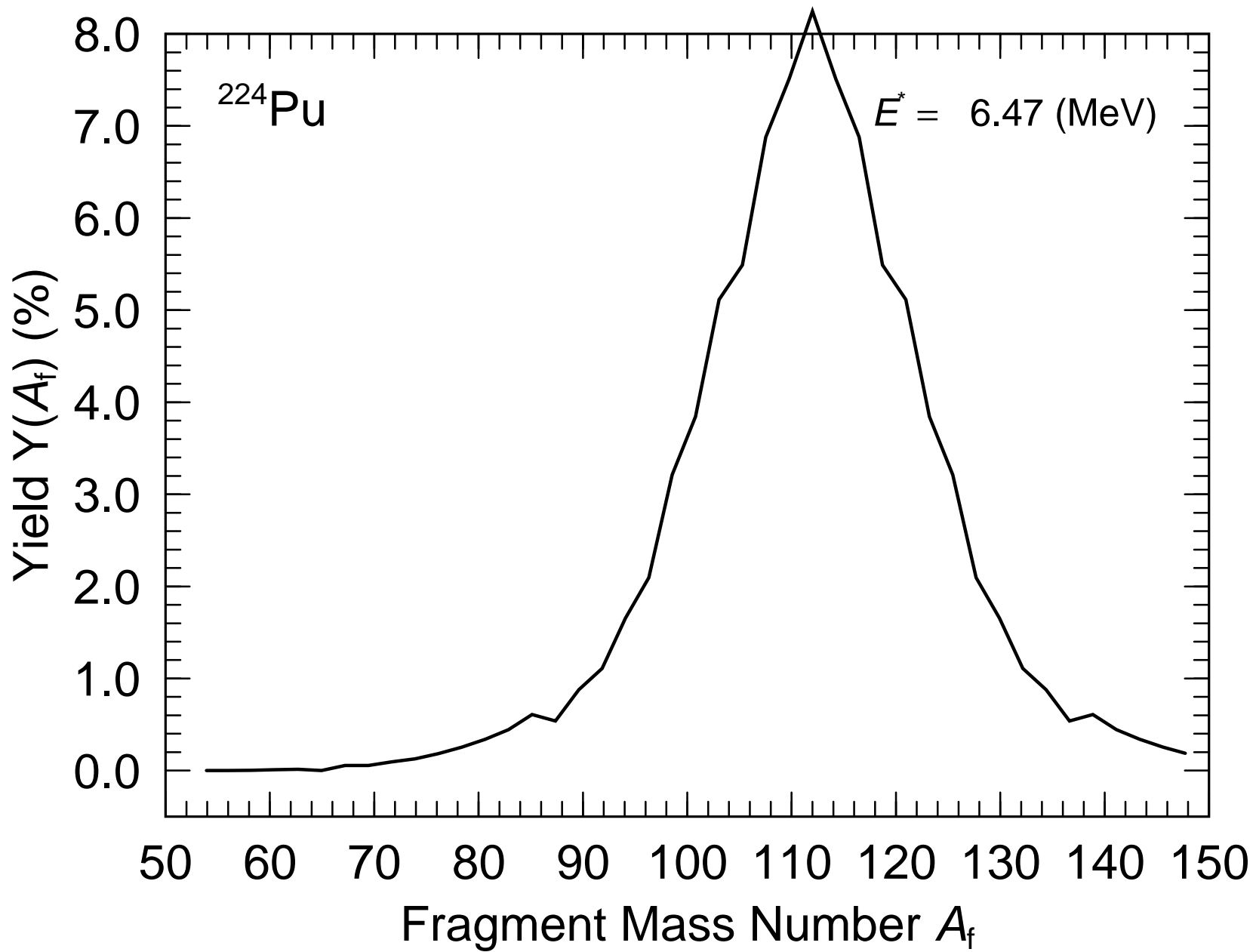


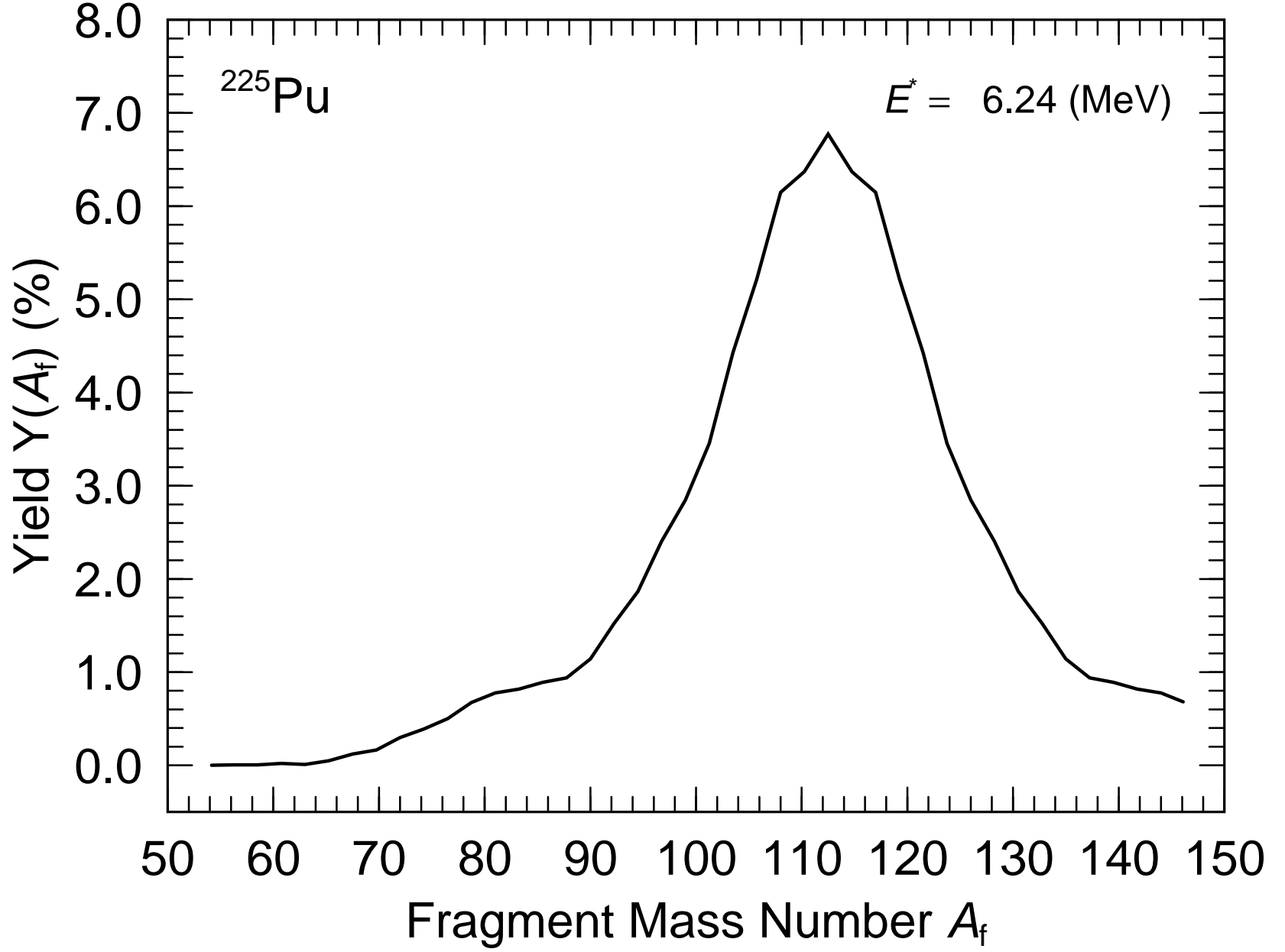


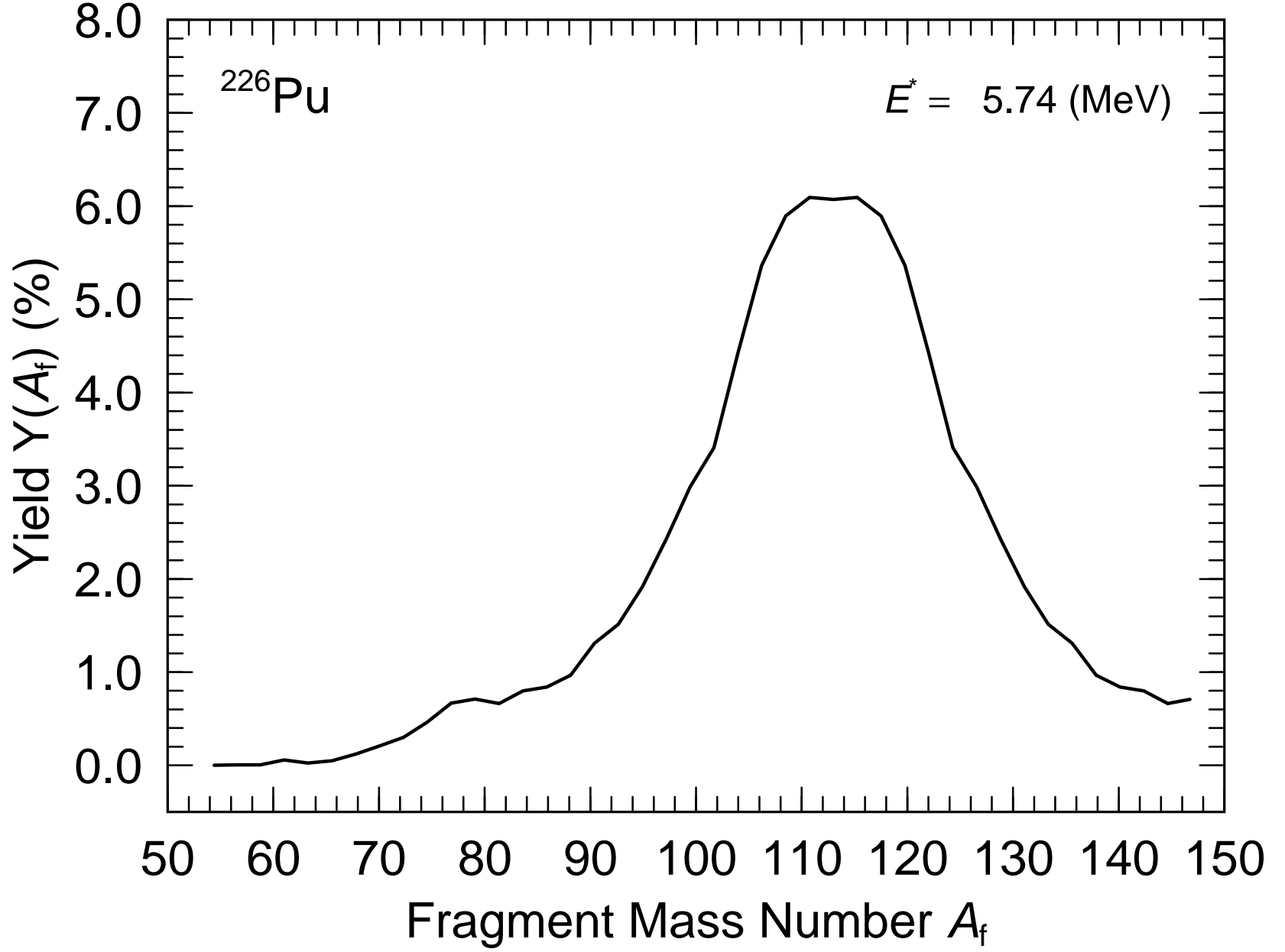


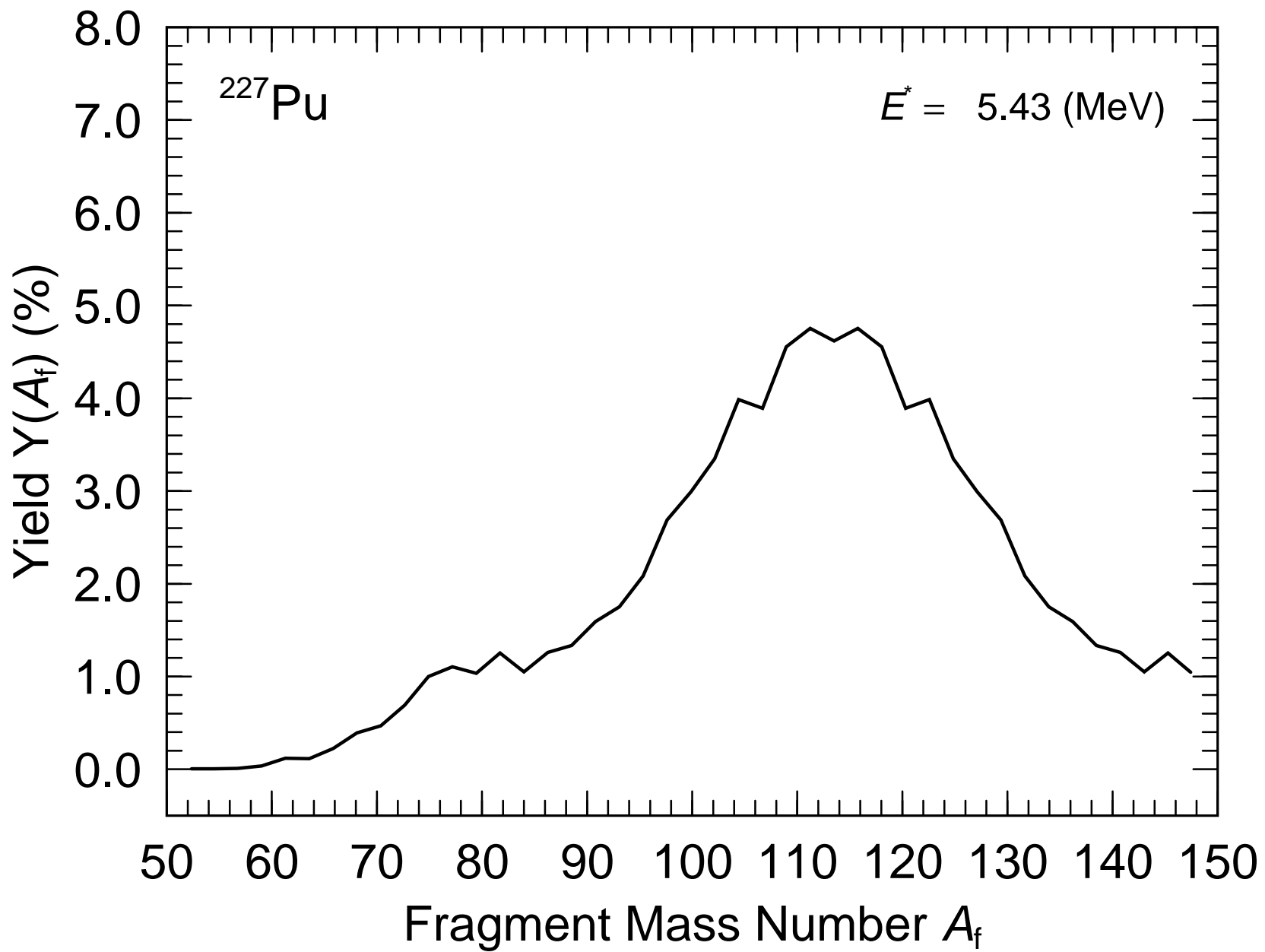


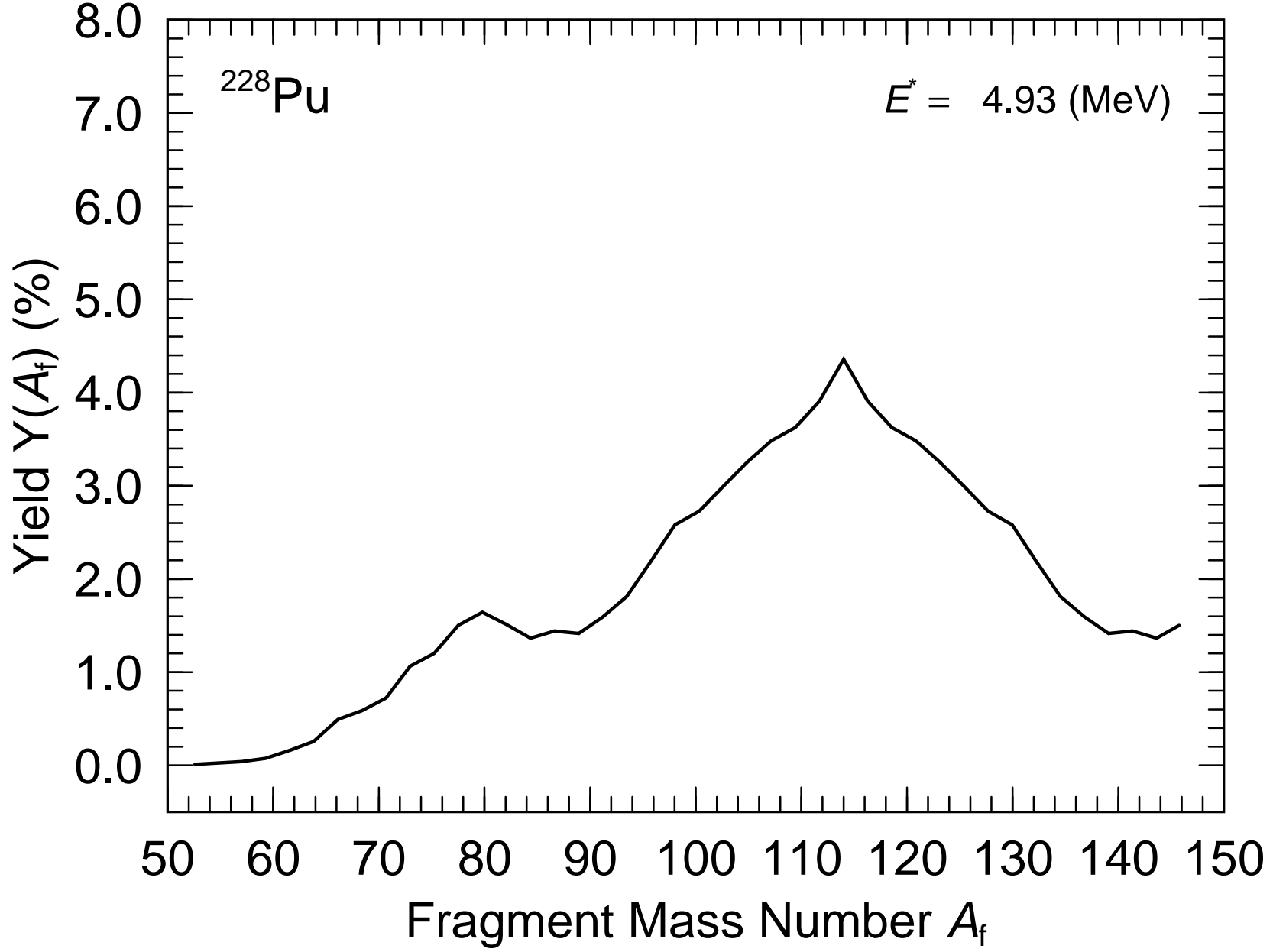


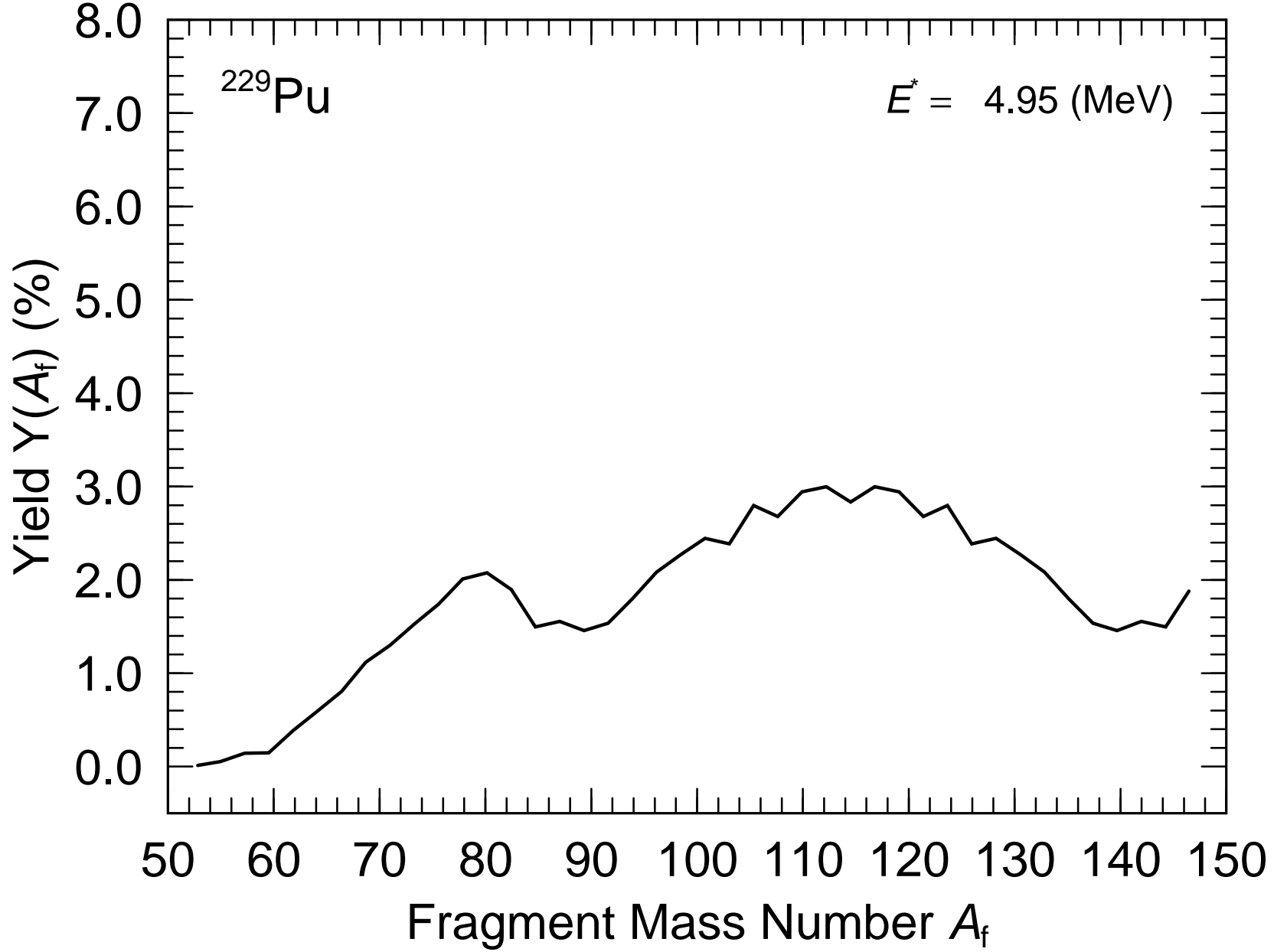


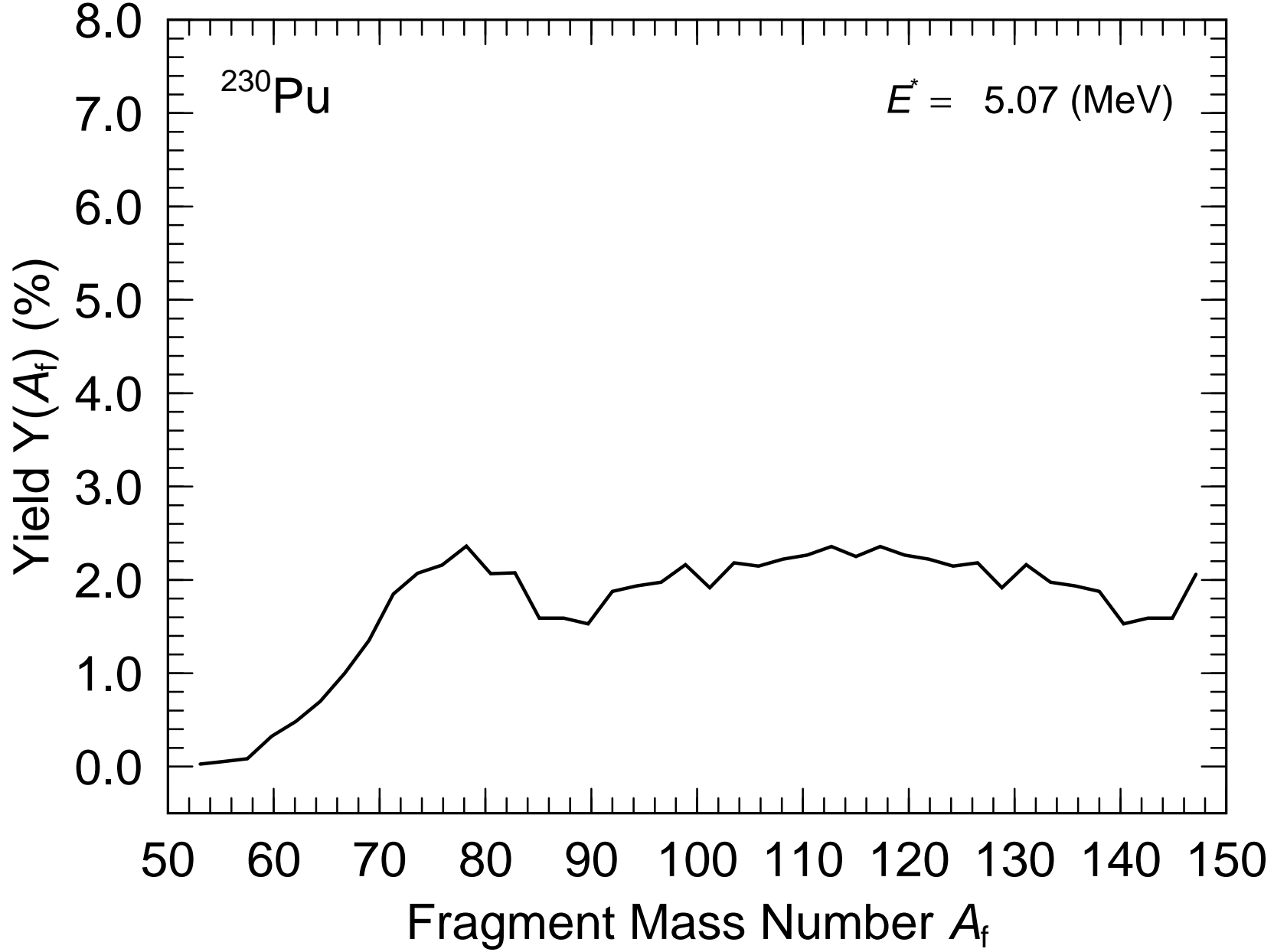


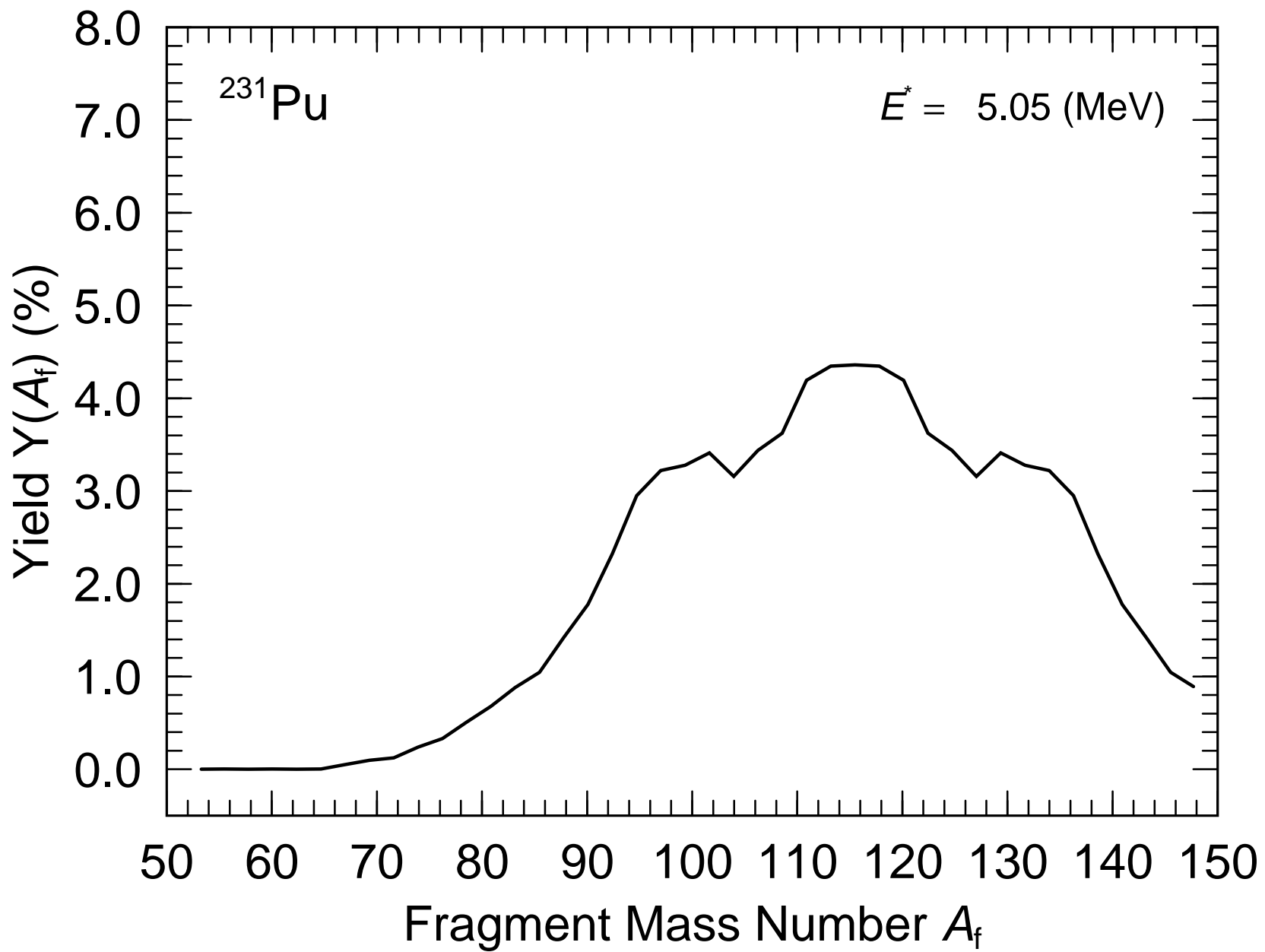


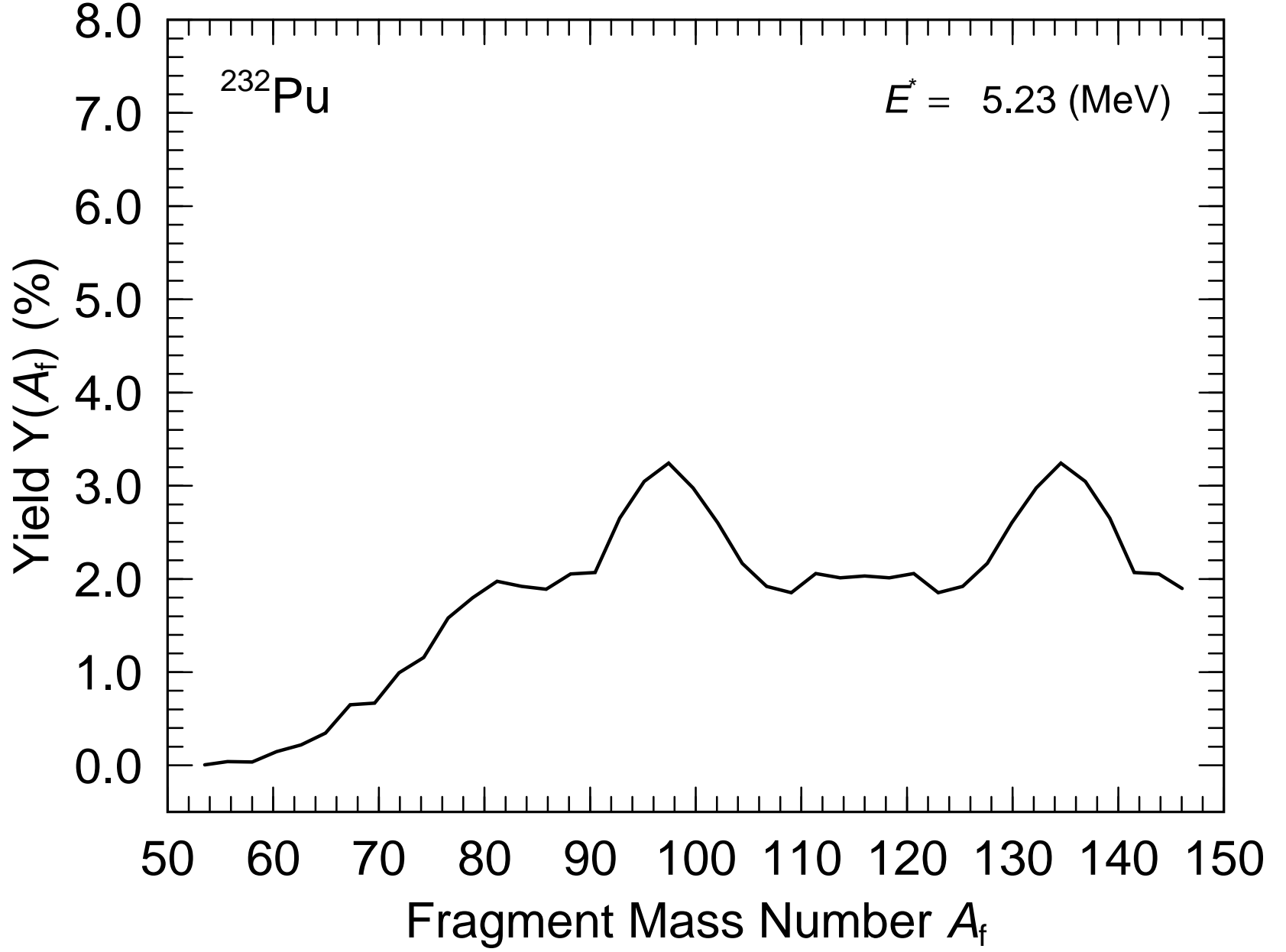


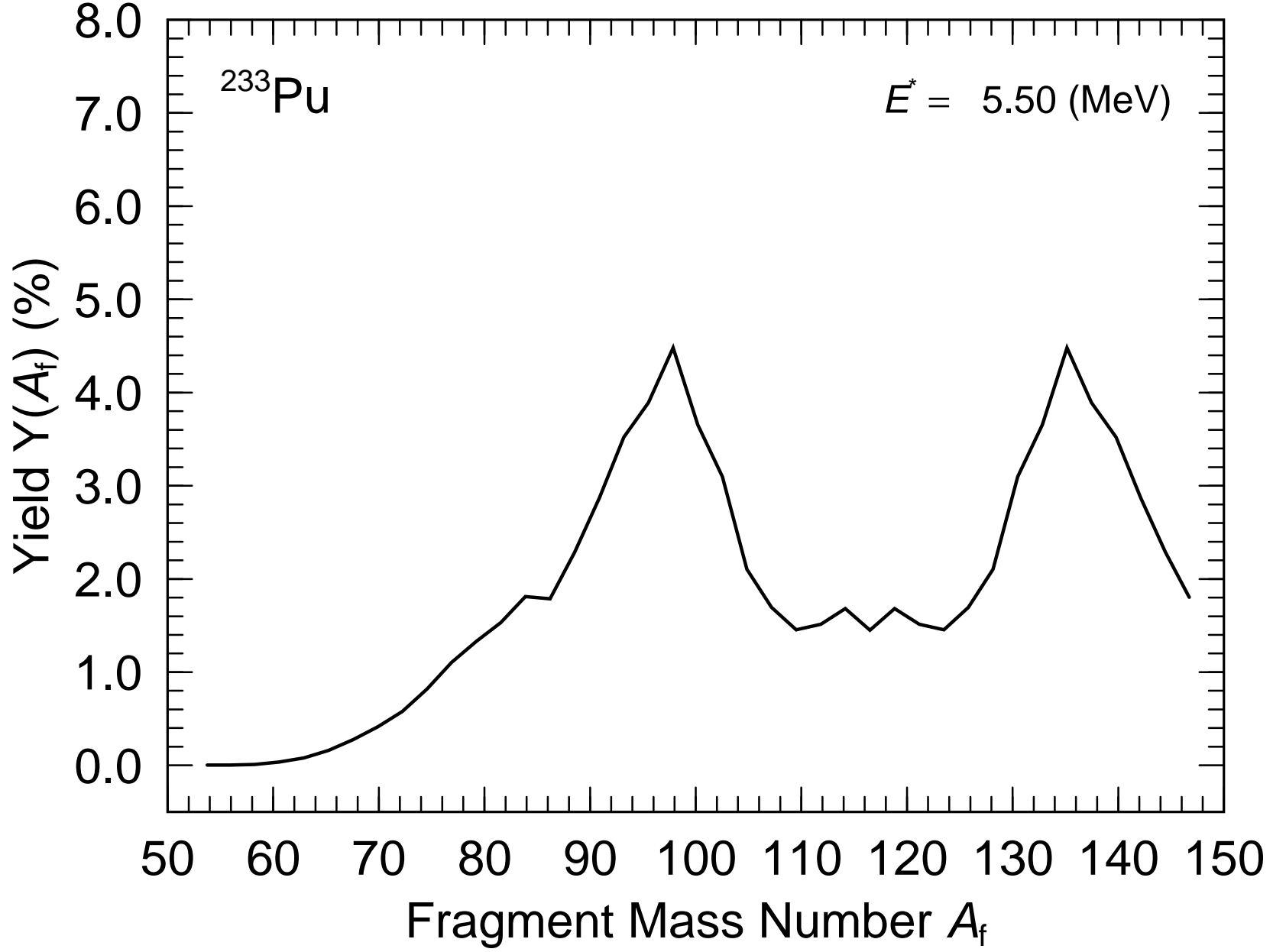


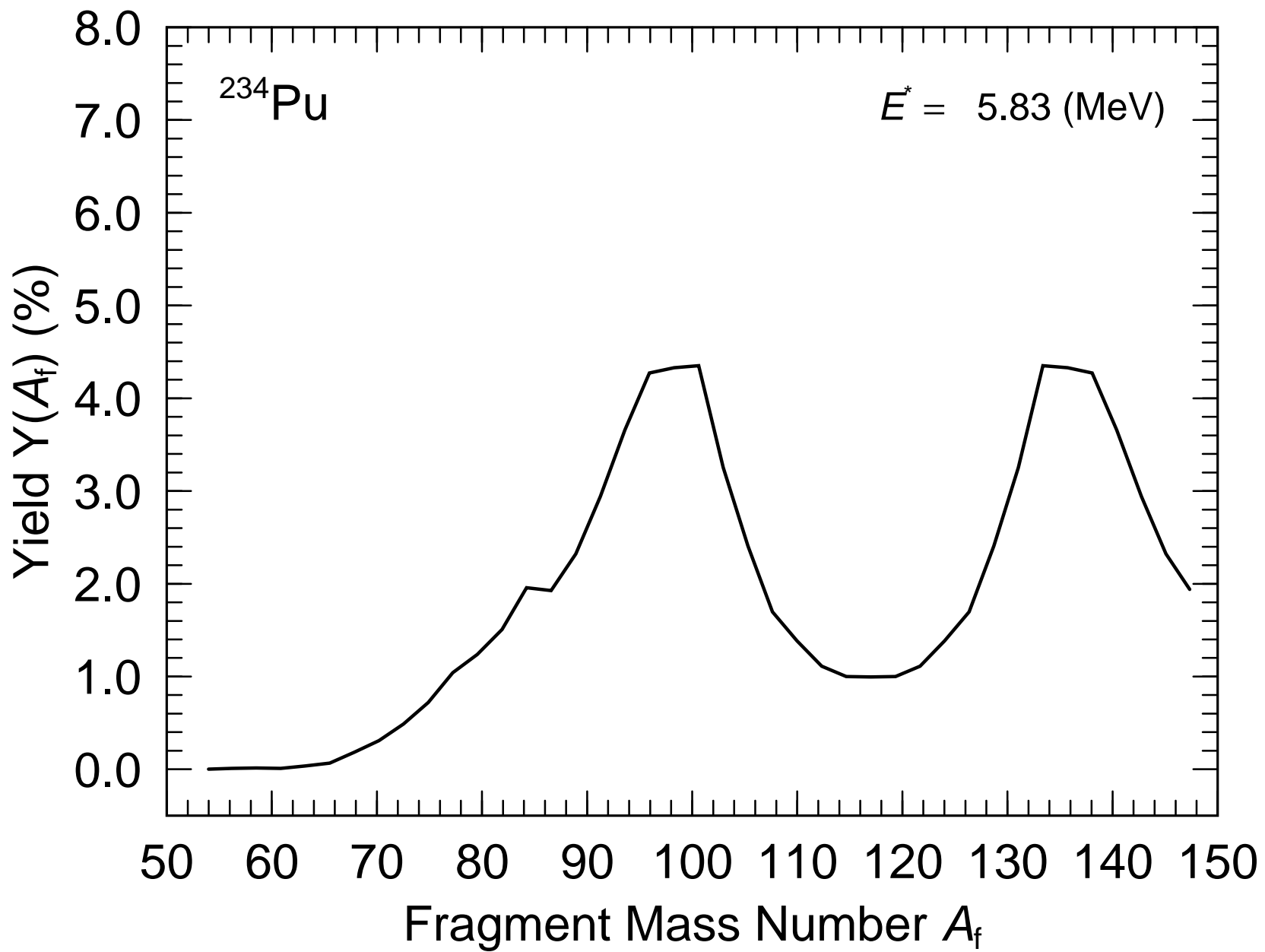


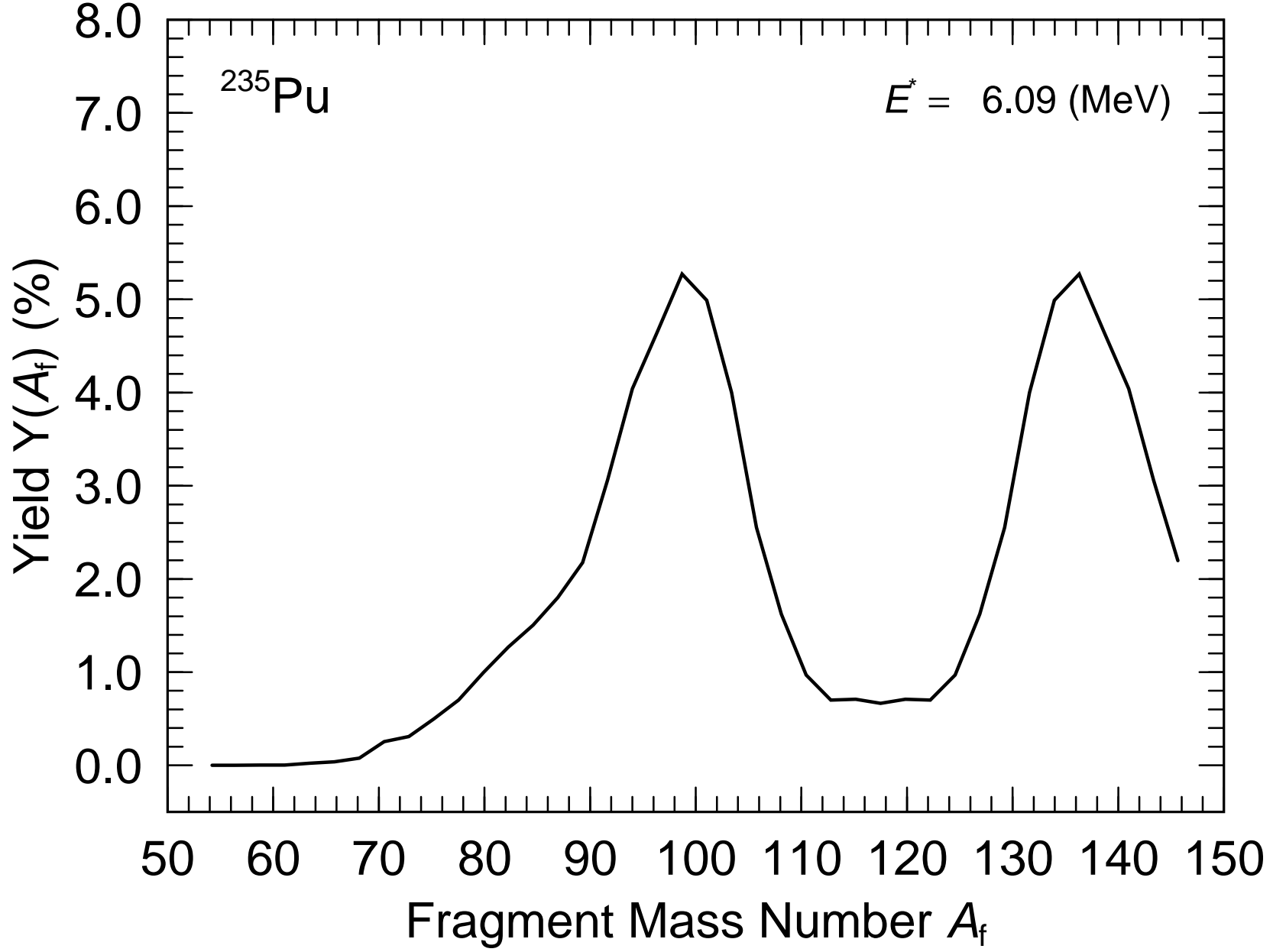


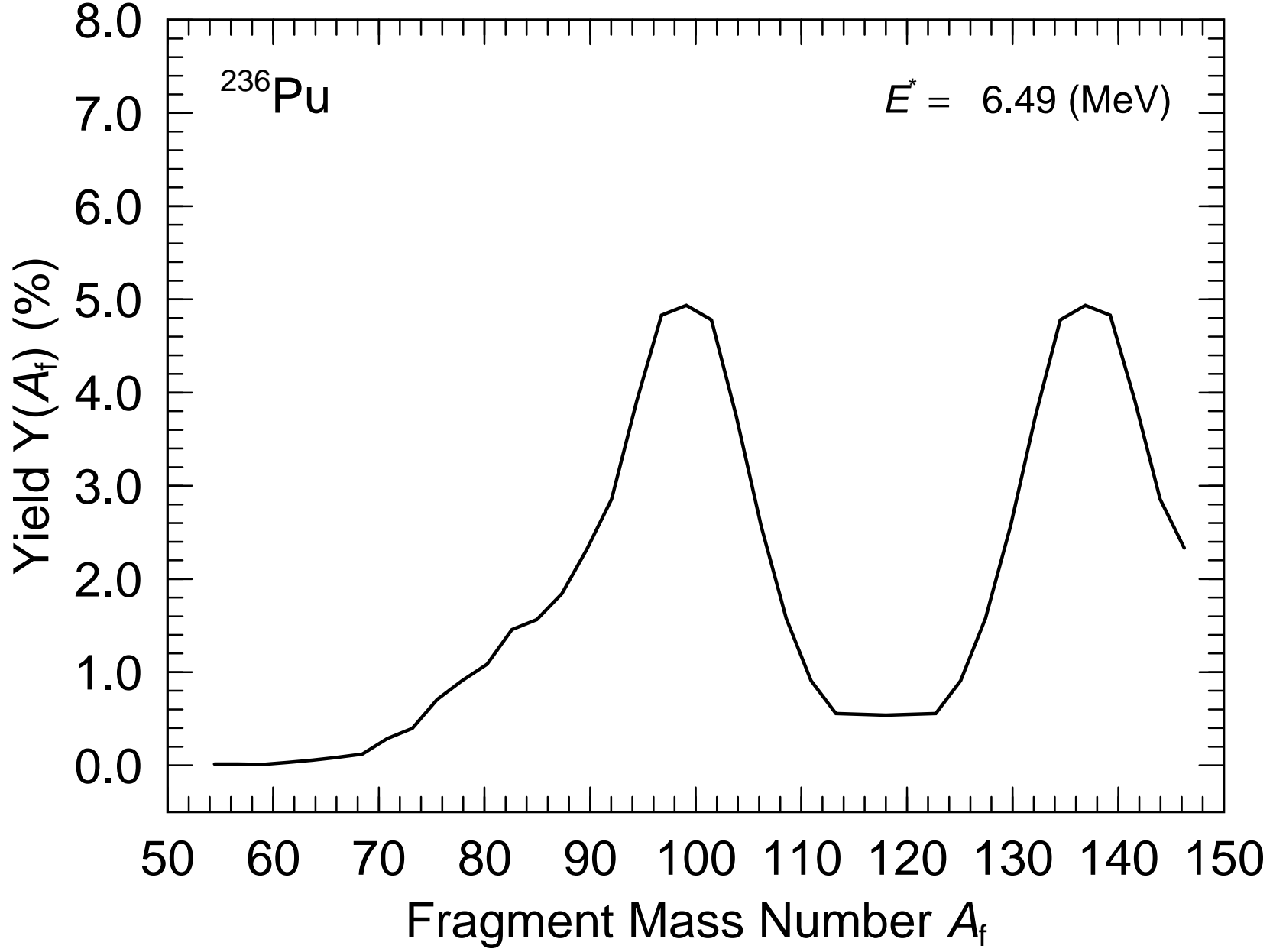


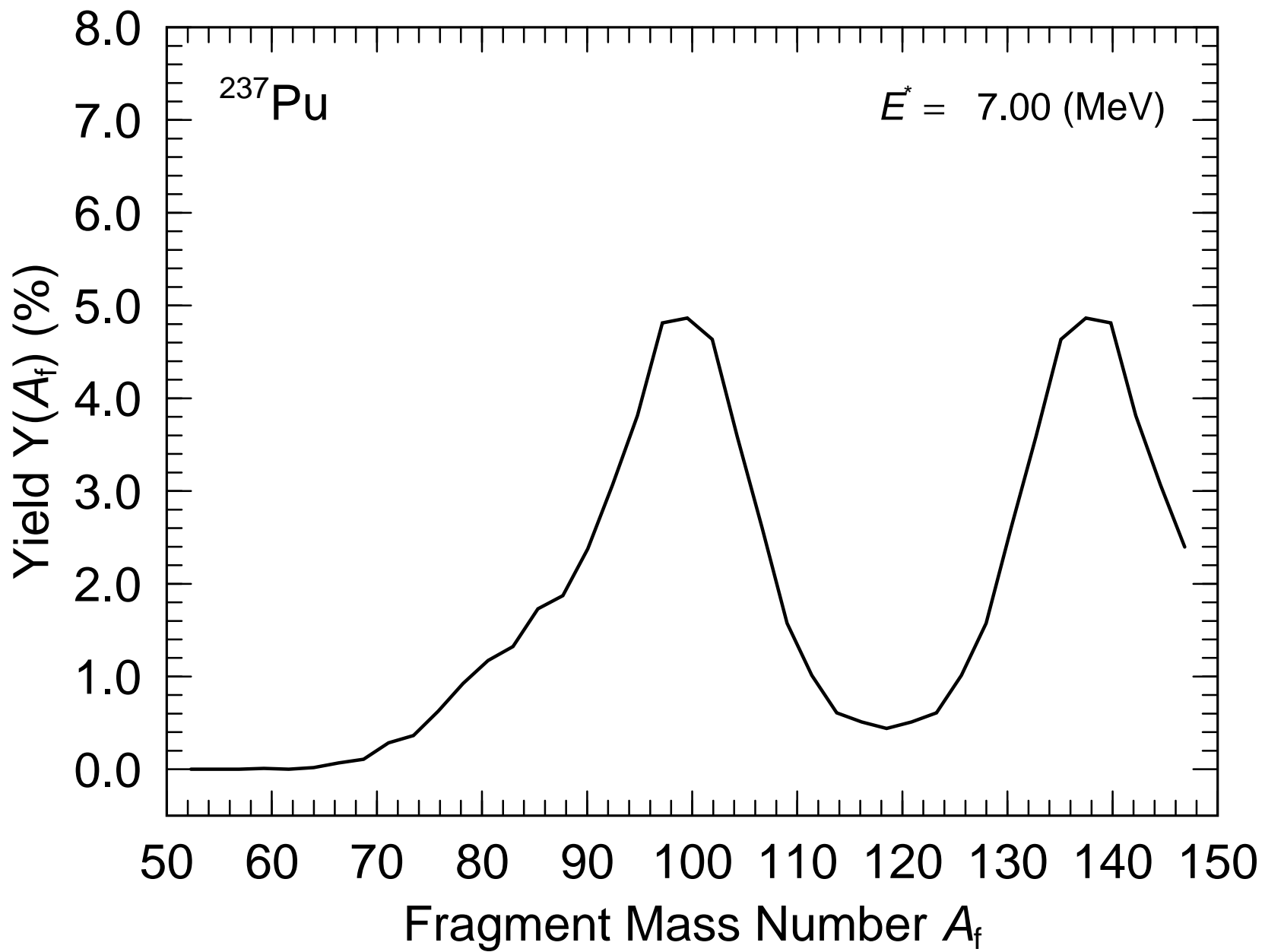


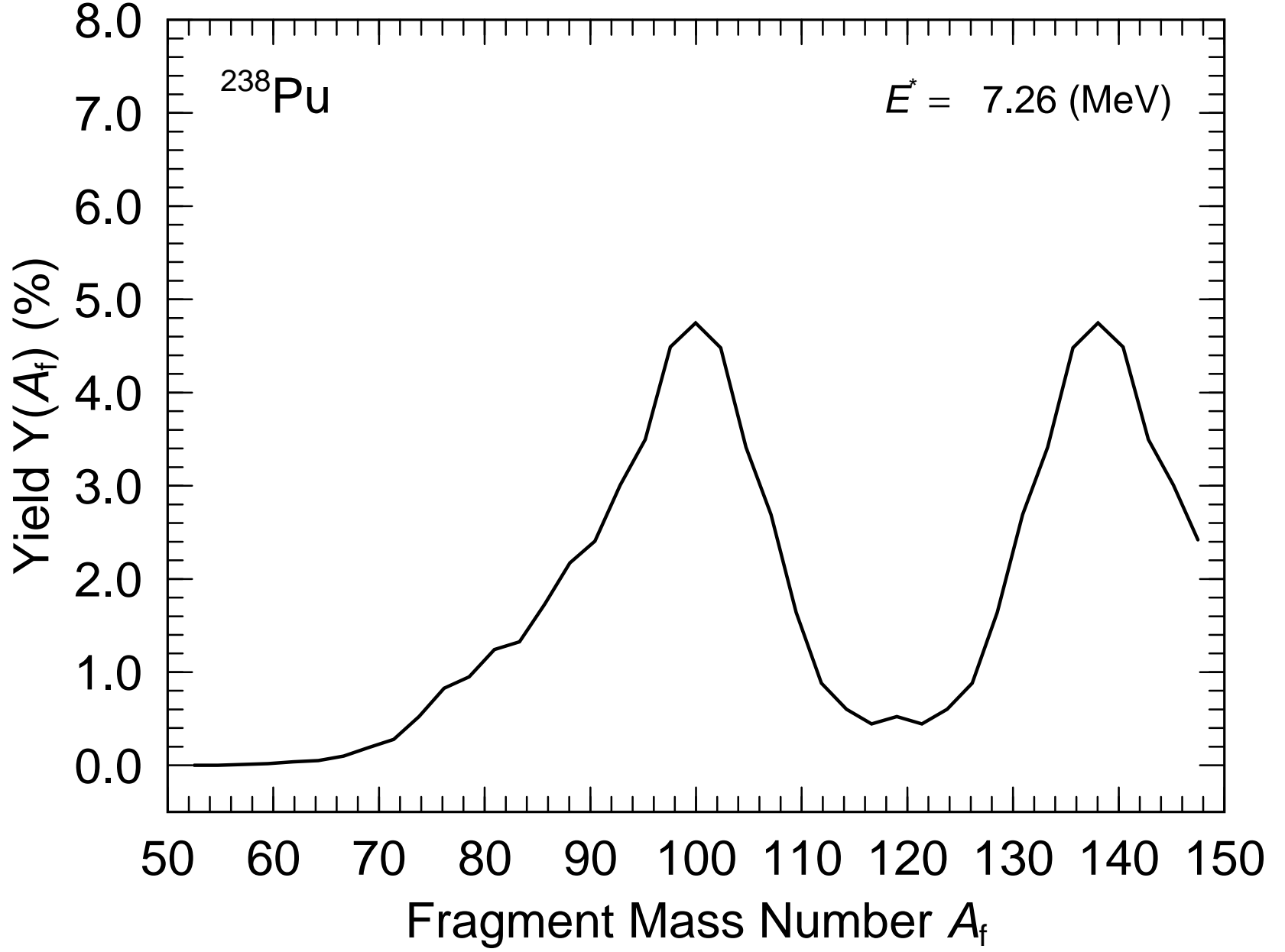


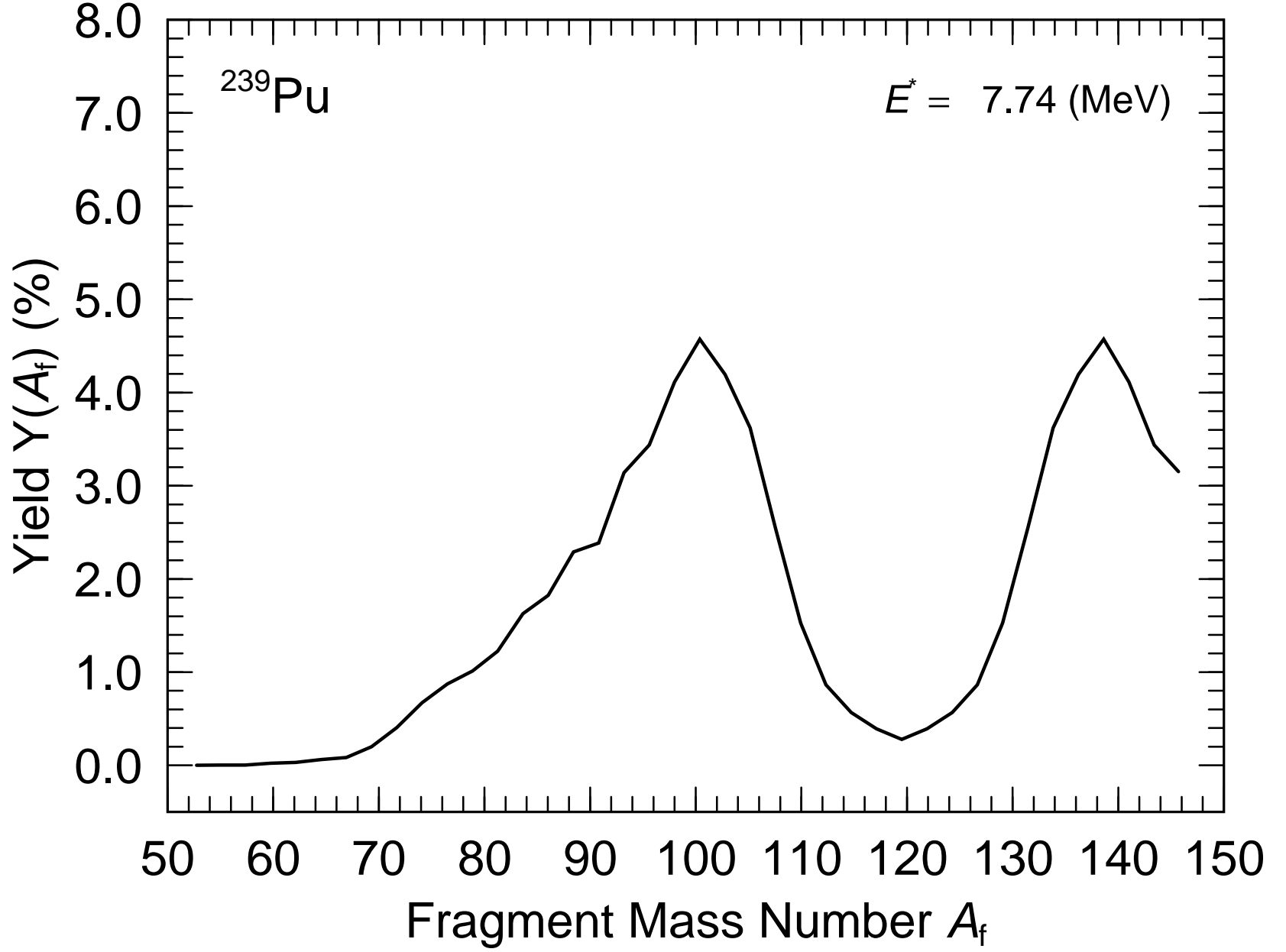


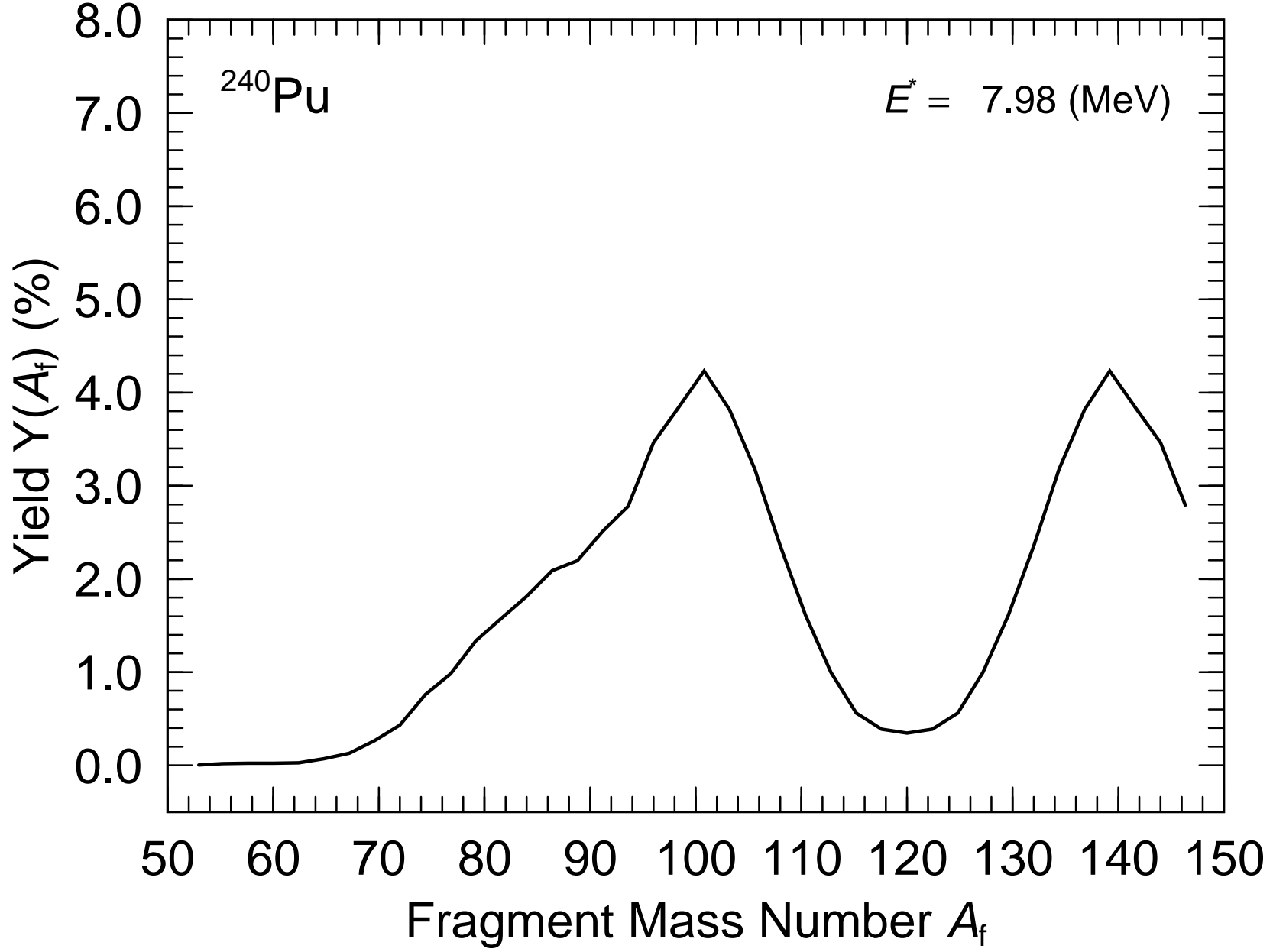


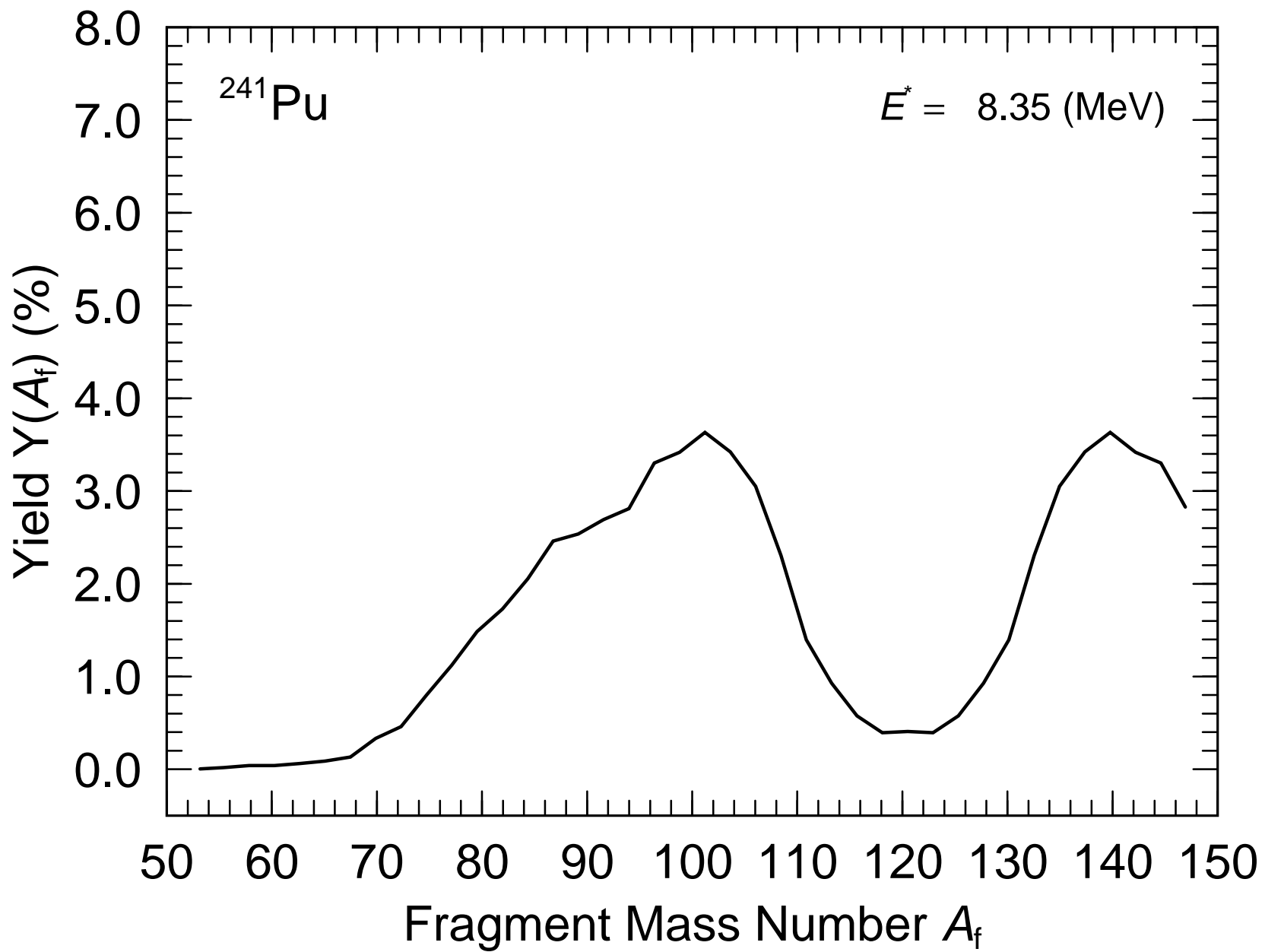


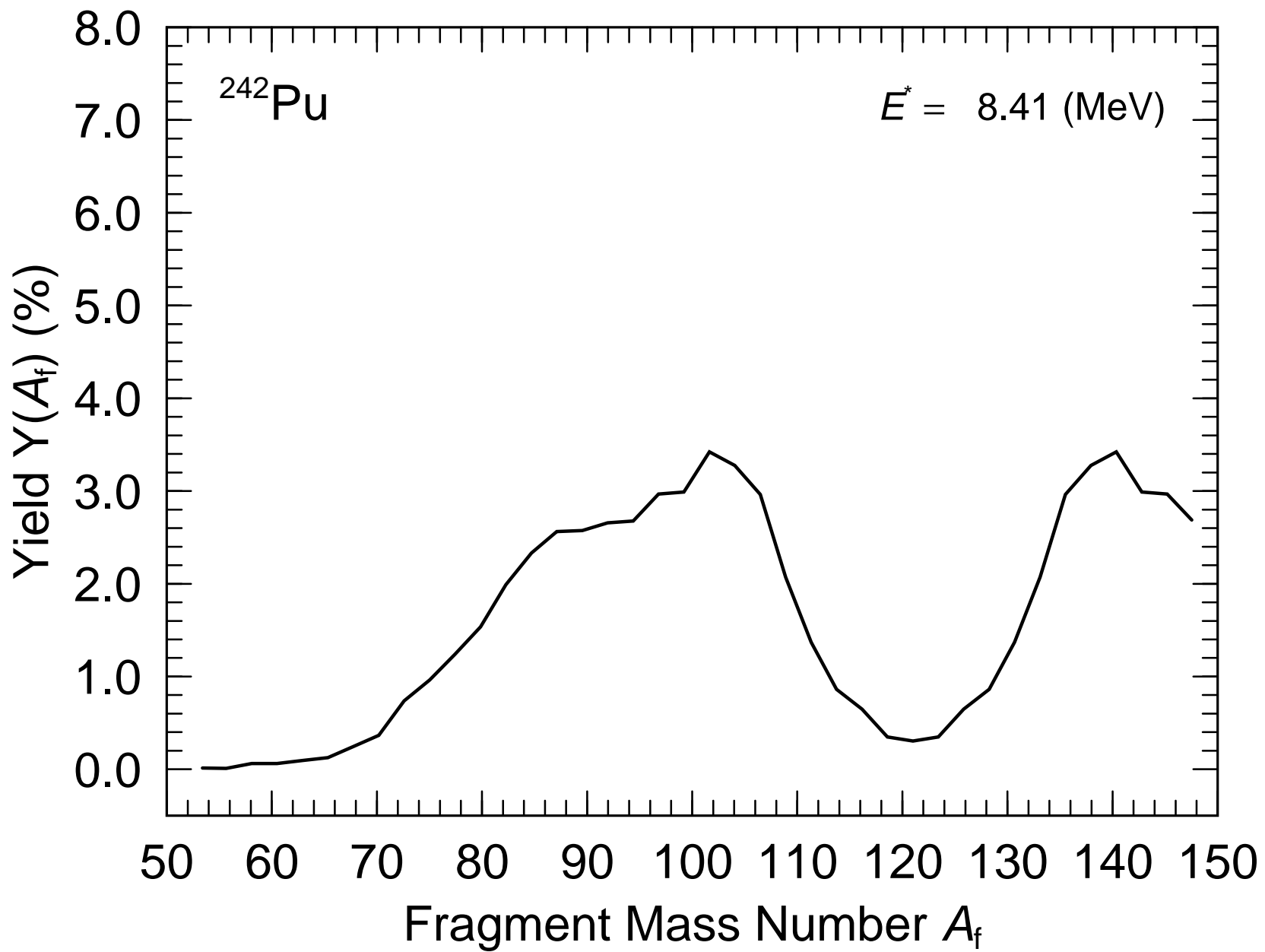


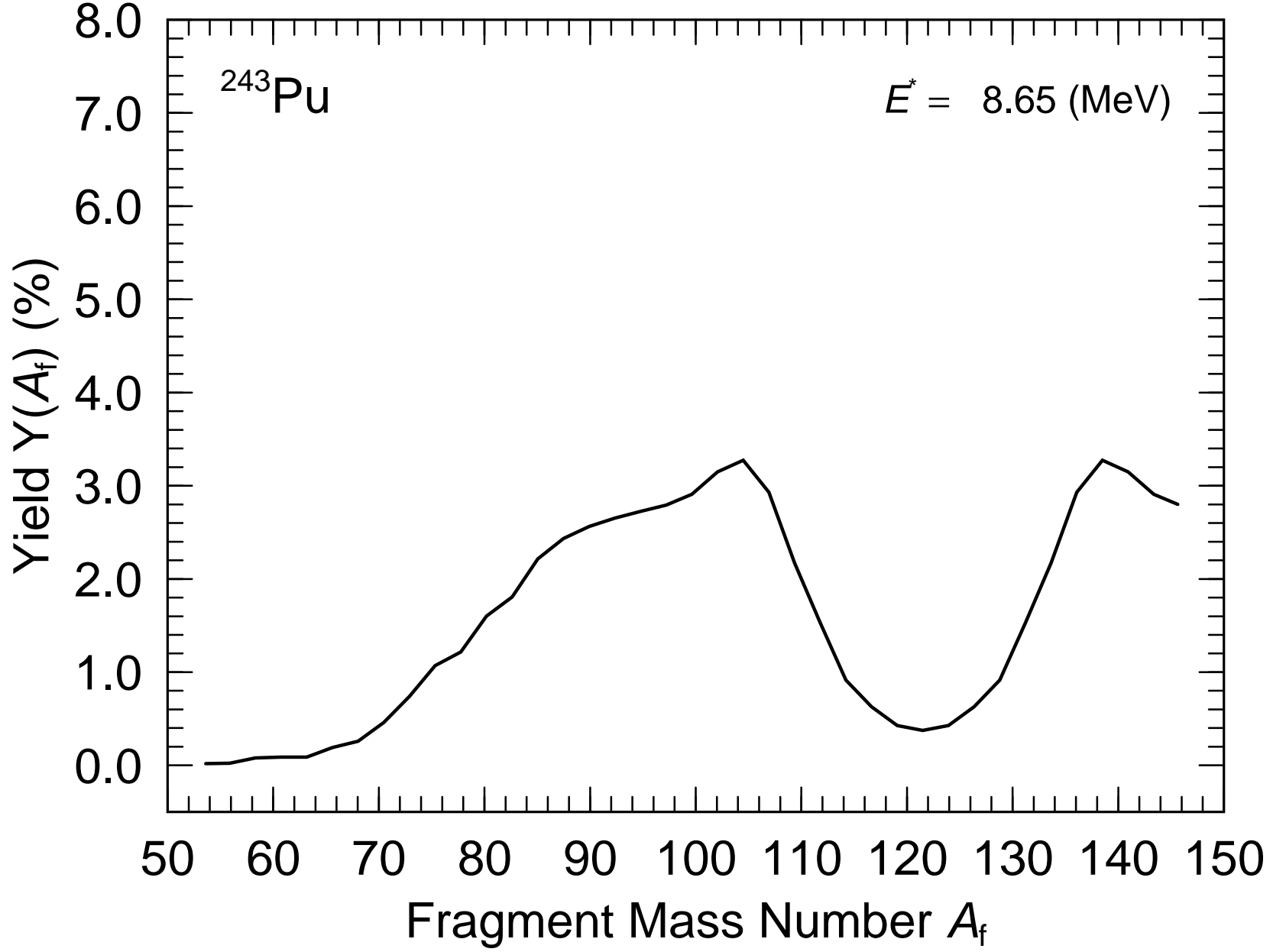


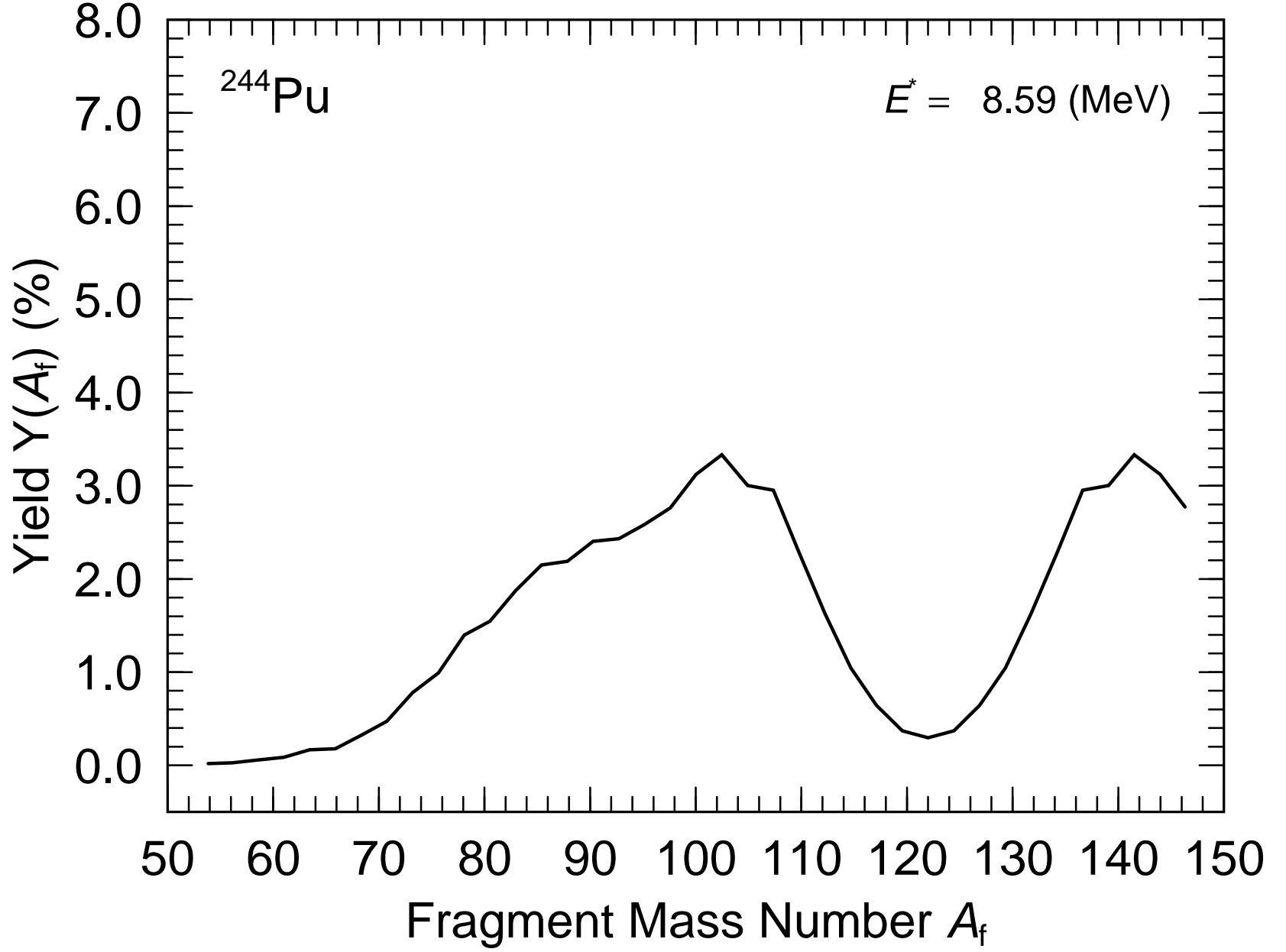




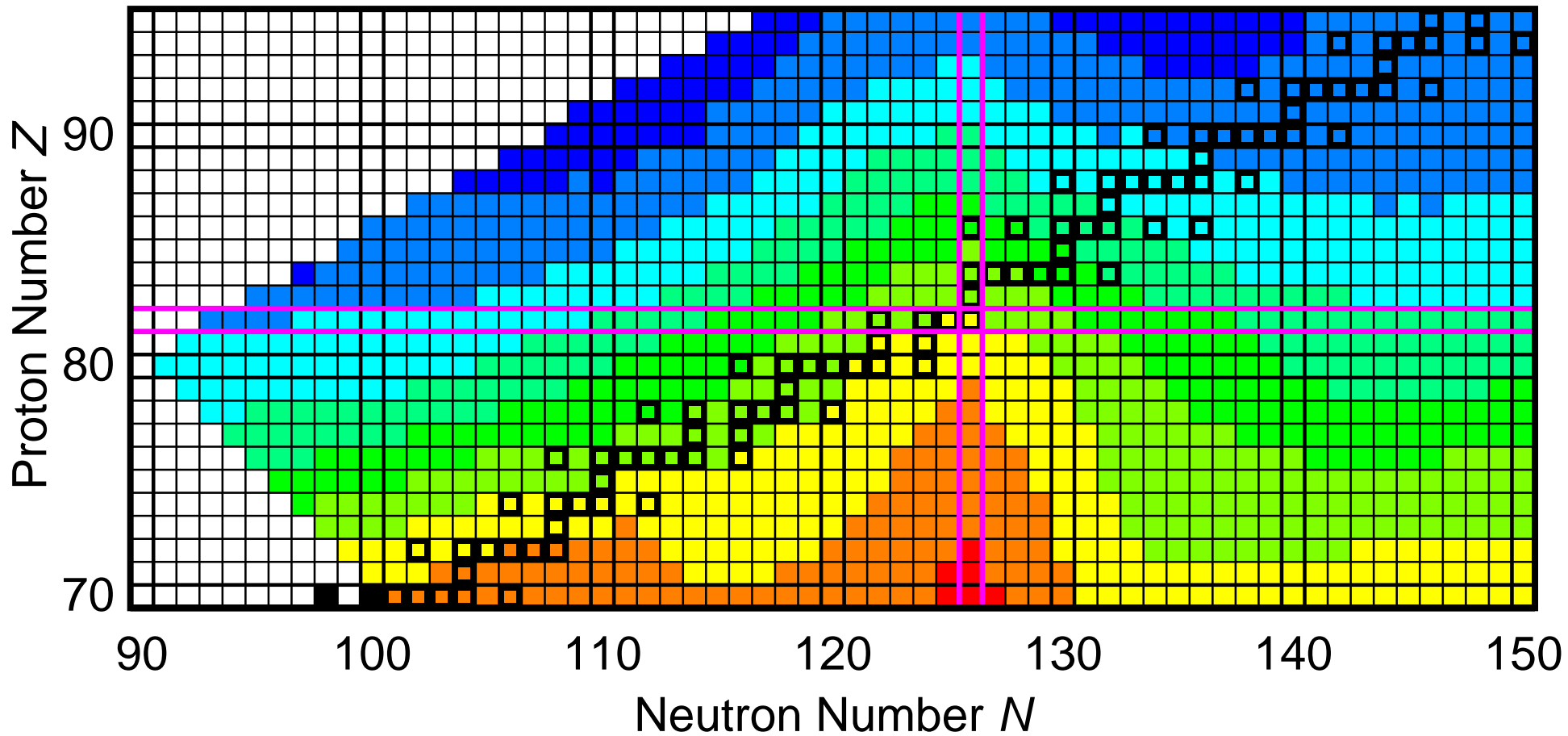
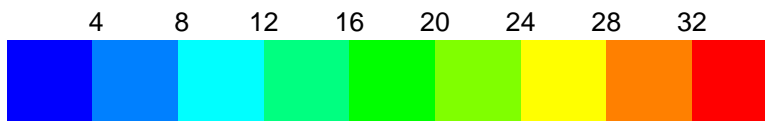








Fission-Barrier Height (MeV)



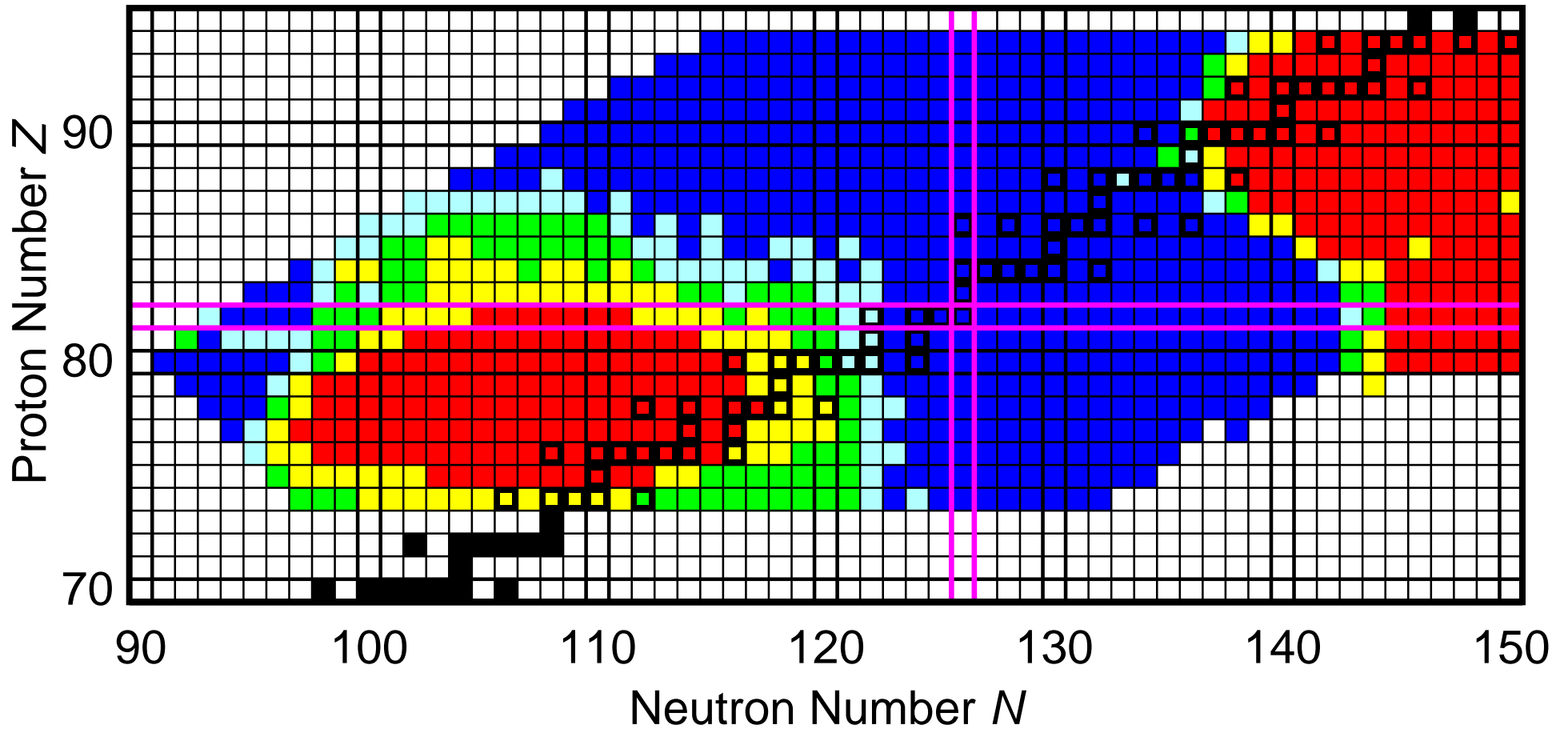
Fission-Yield Valley-to-Peak Ratio

0.2 0.4 0.6 0.8

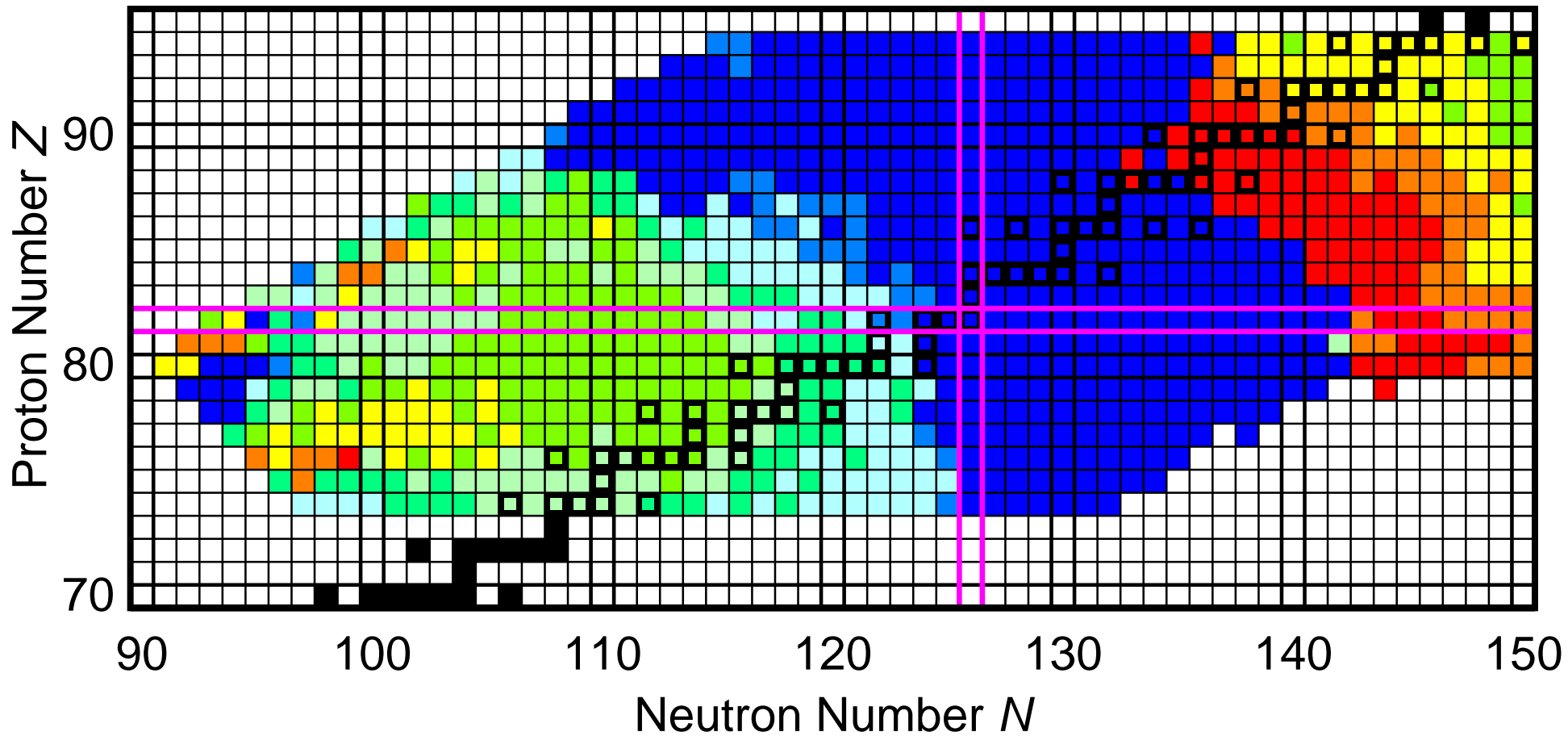
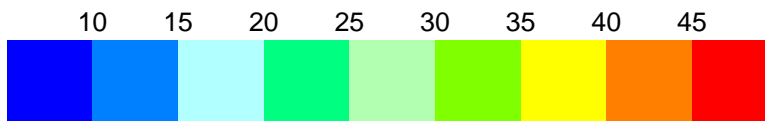
Asymmetric

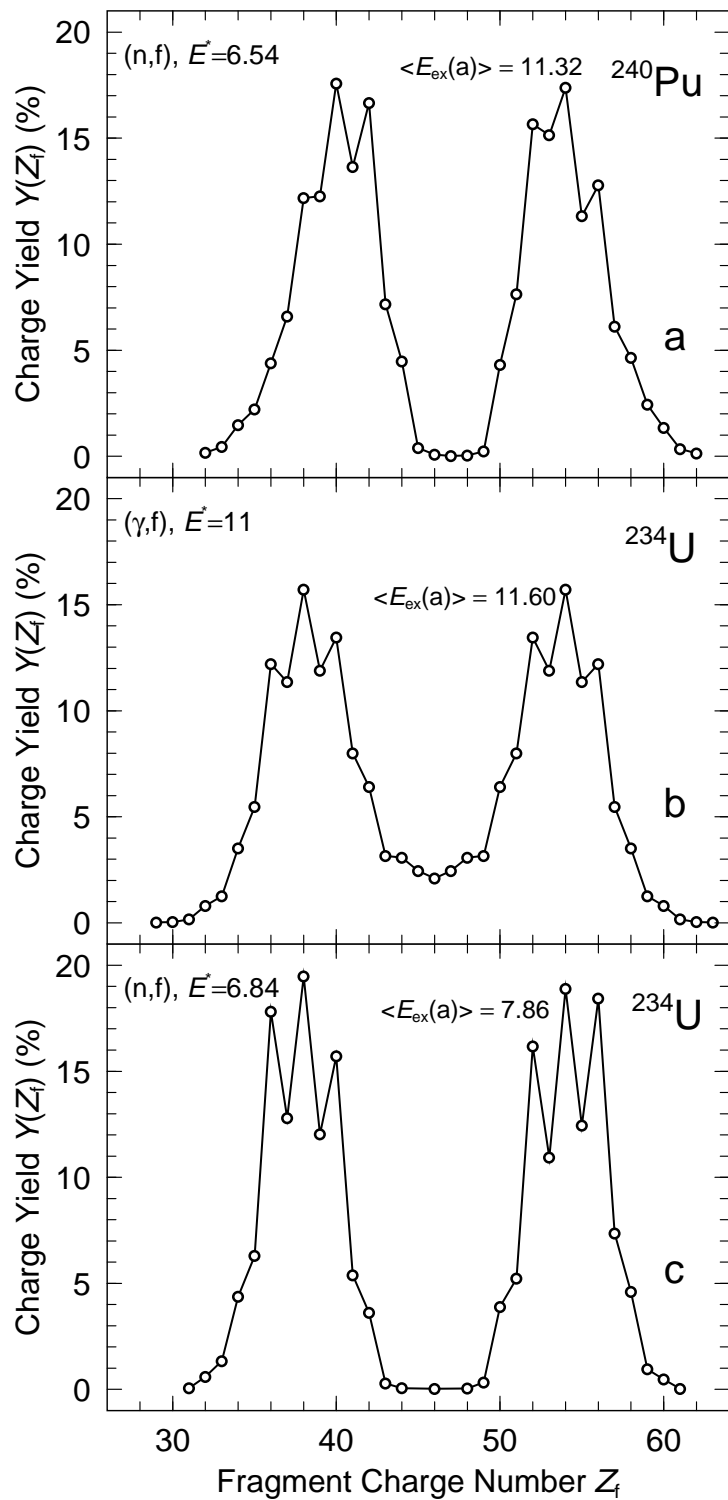


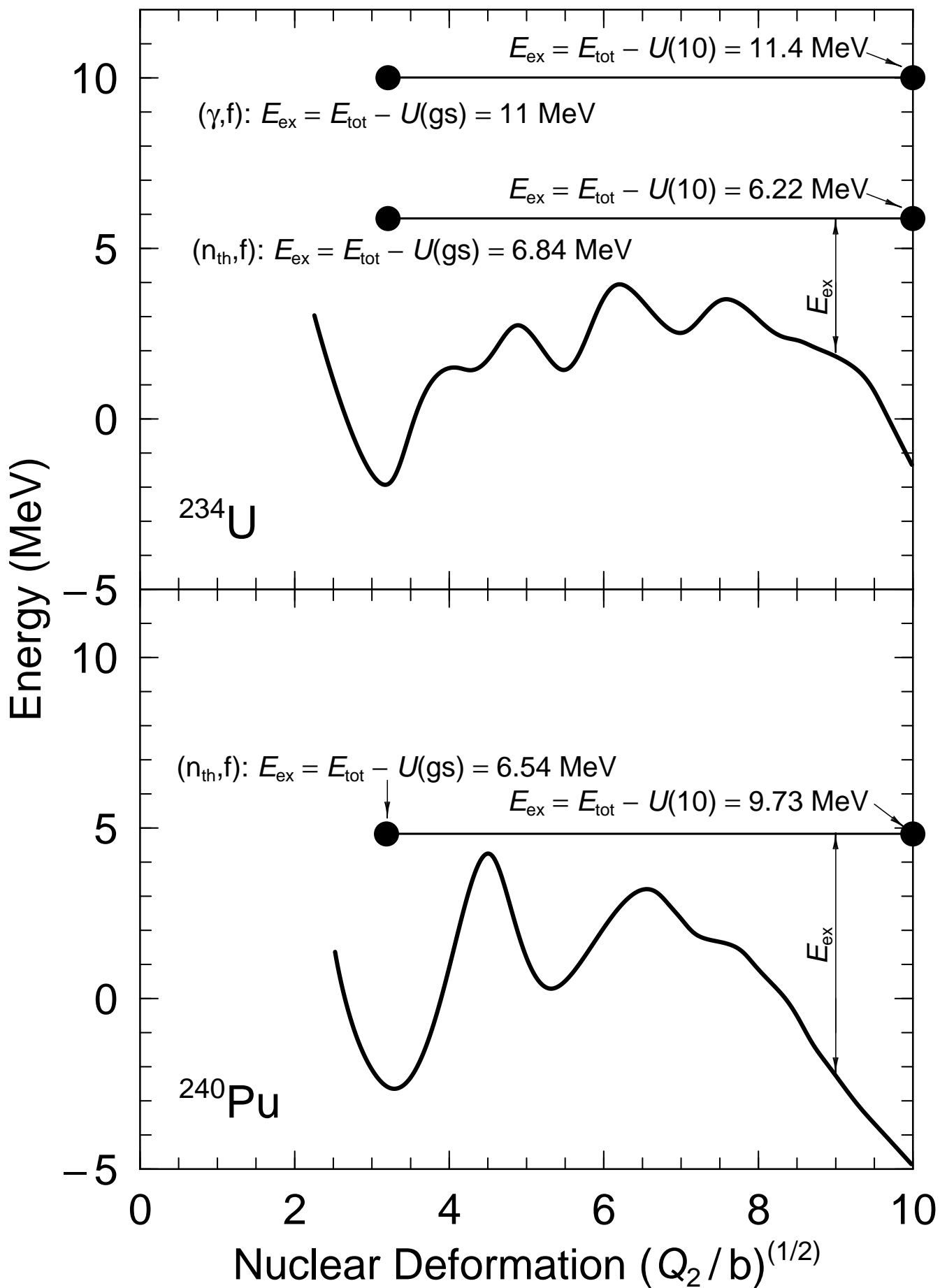
Symmetric

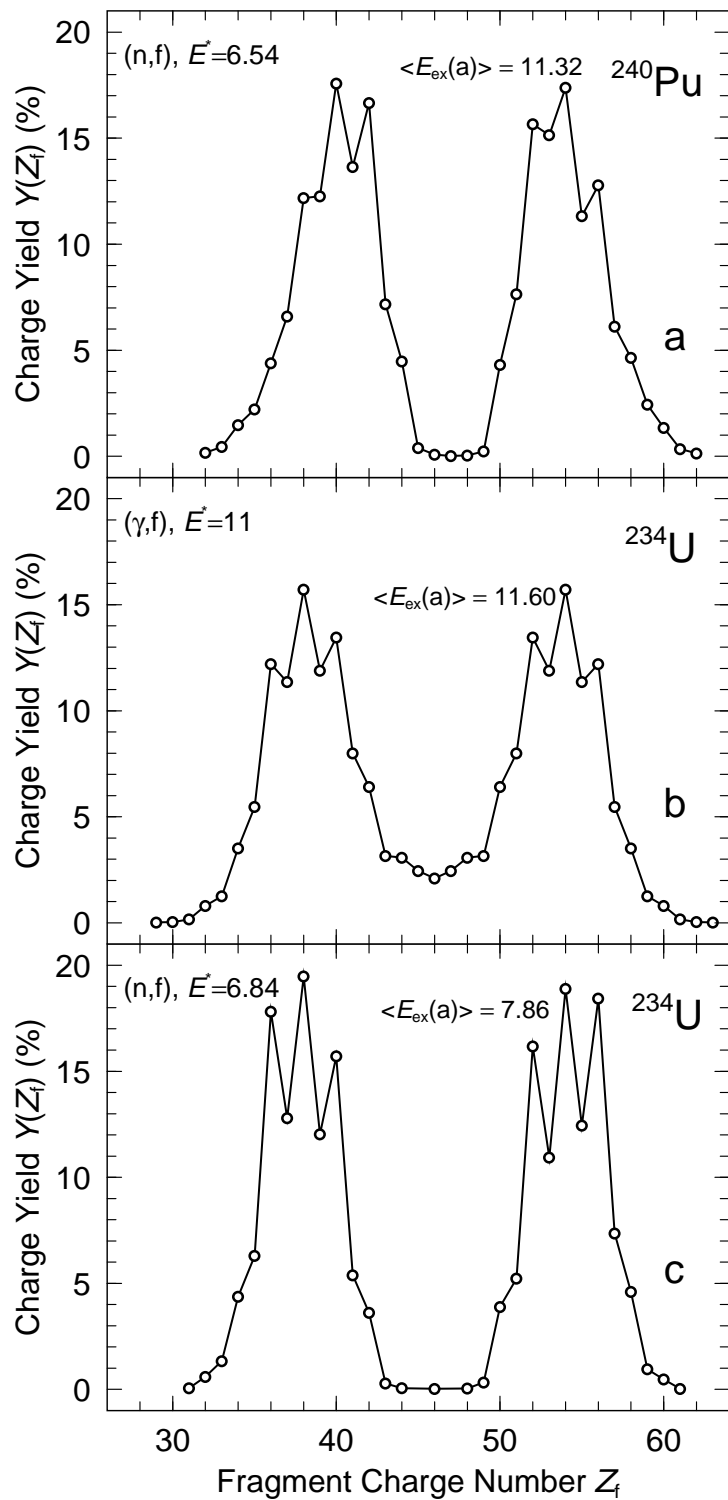


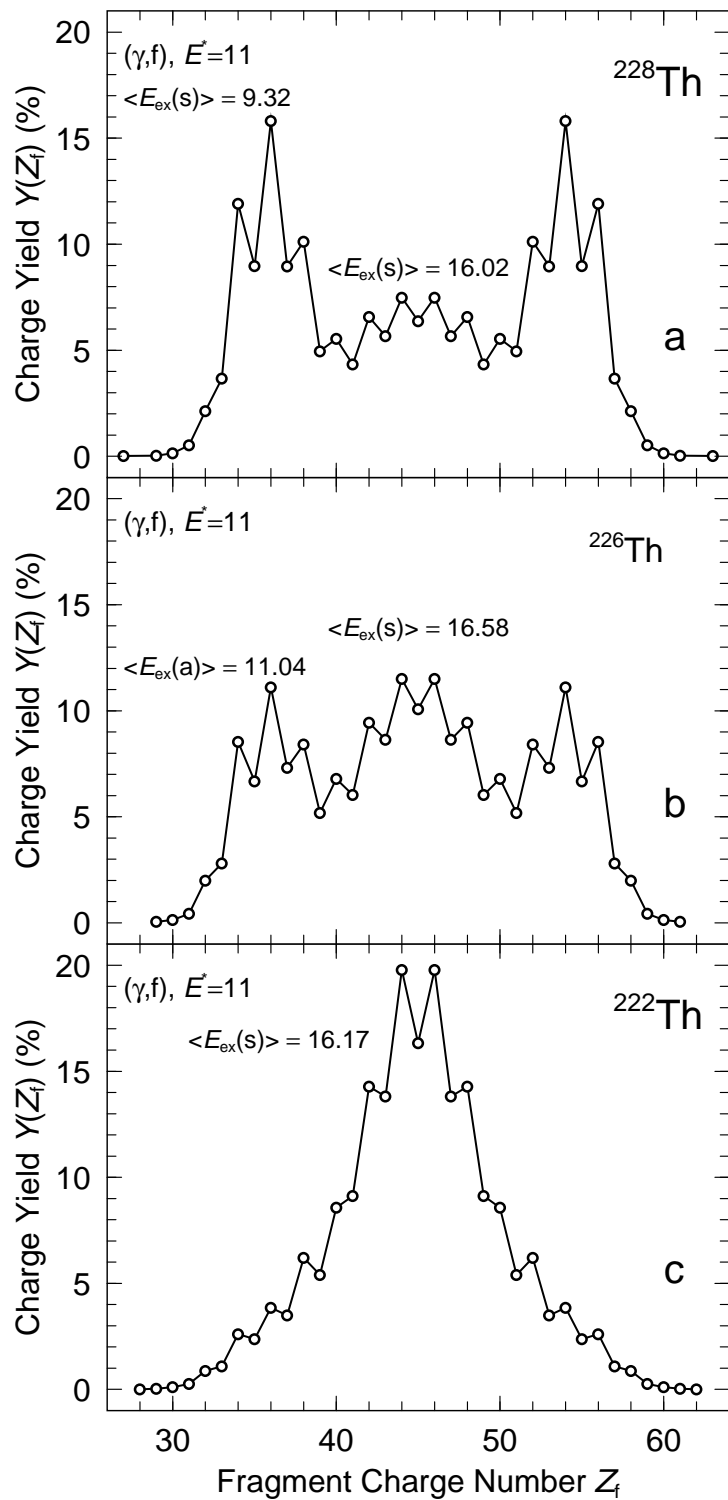
Fission-Fragment Mass Division (MH-ML)

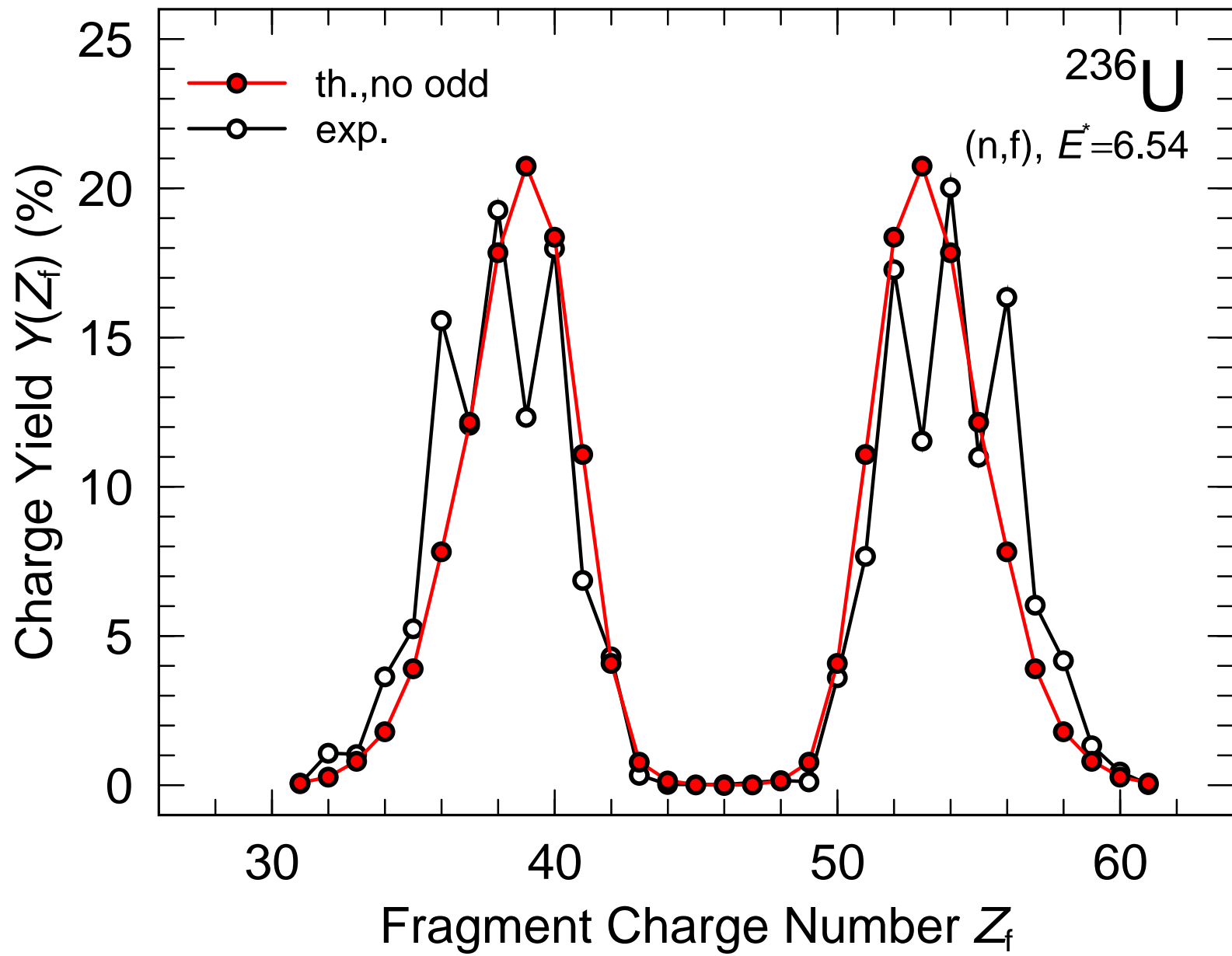










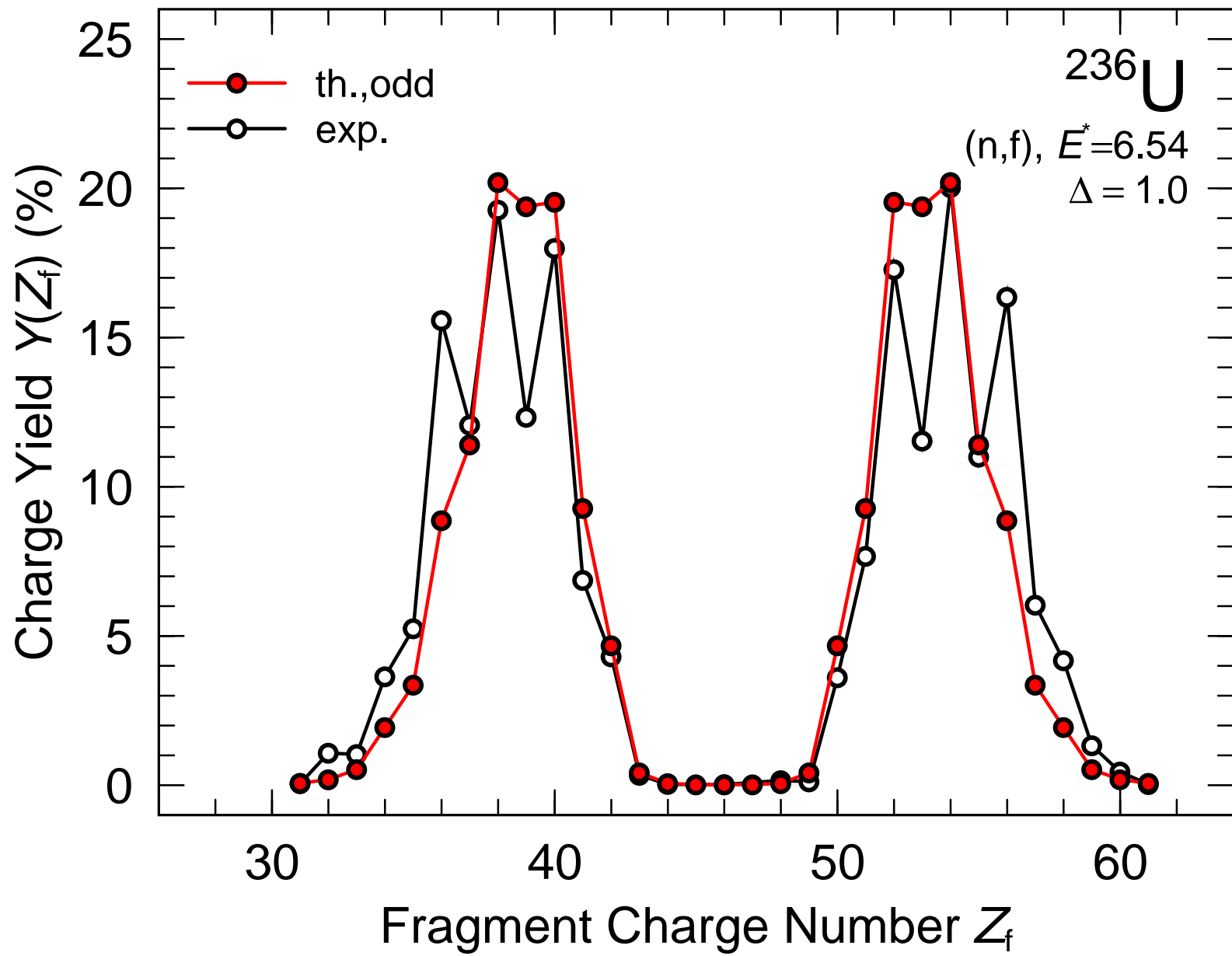


```
READ(LU,'(2f10.3)') r,rw
```

```
idiv =(N+1)/2
```

```
if(N+1 .eq. 2*idiv) r = r + (rw-1 +0.01)*2*1.0
```

```
E(I,J,K,L,N) = r
```



$$\text{IRAN} = 1 + 3 * \text{RAND}(0) - 0.00001$$

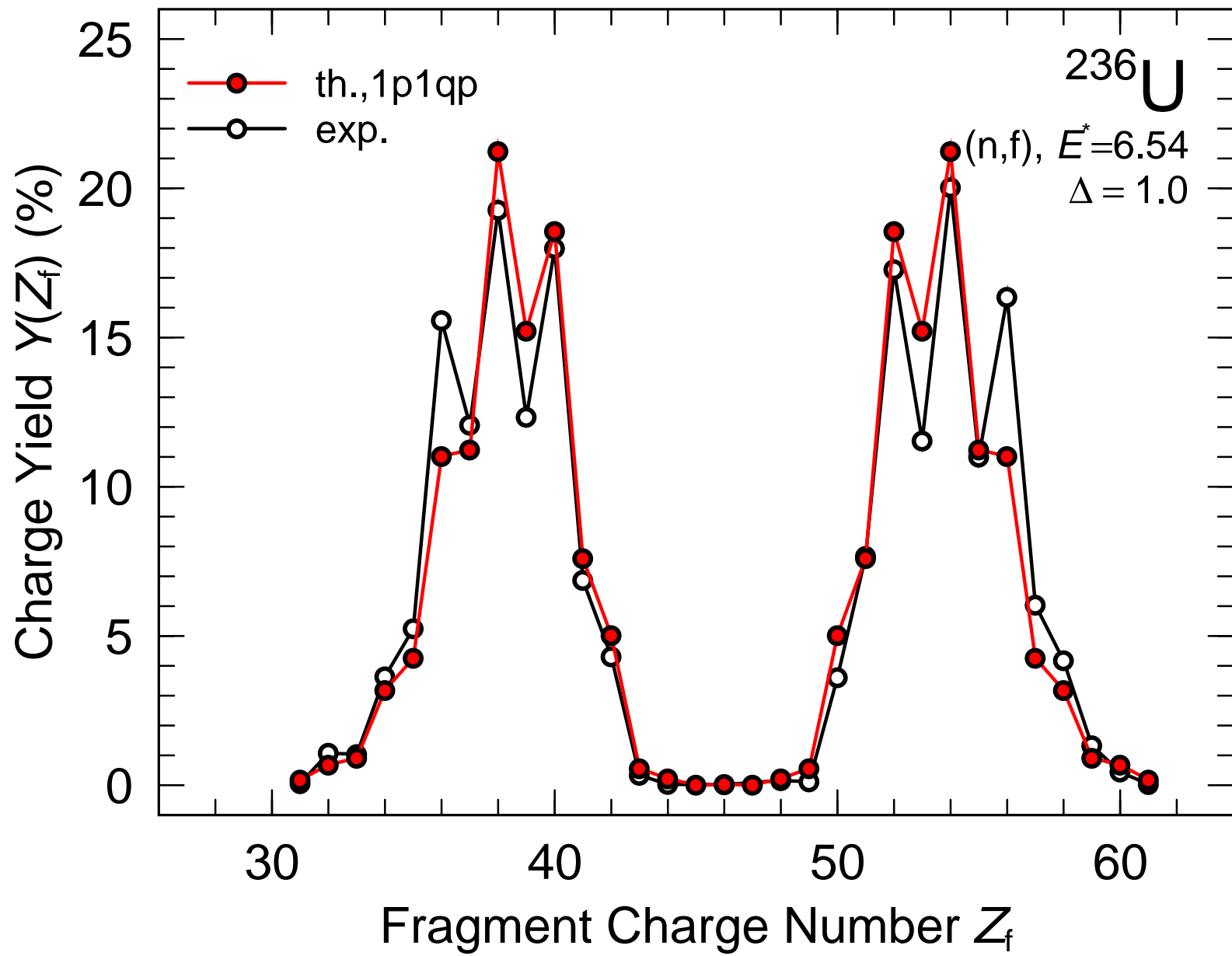
$$\text{LN} = \text{LS} + \text{IRAN} - 2$$

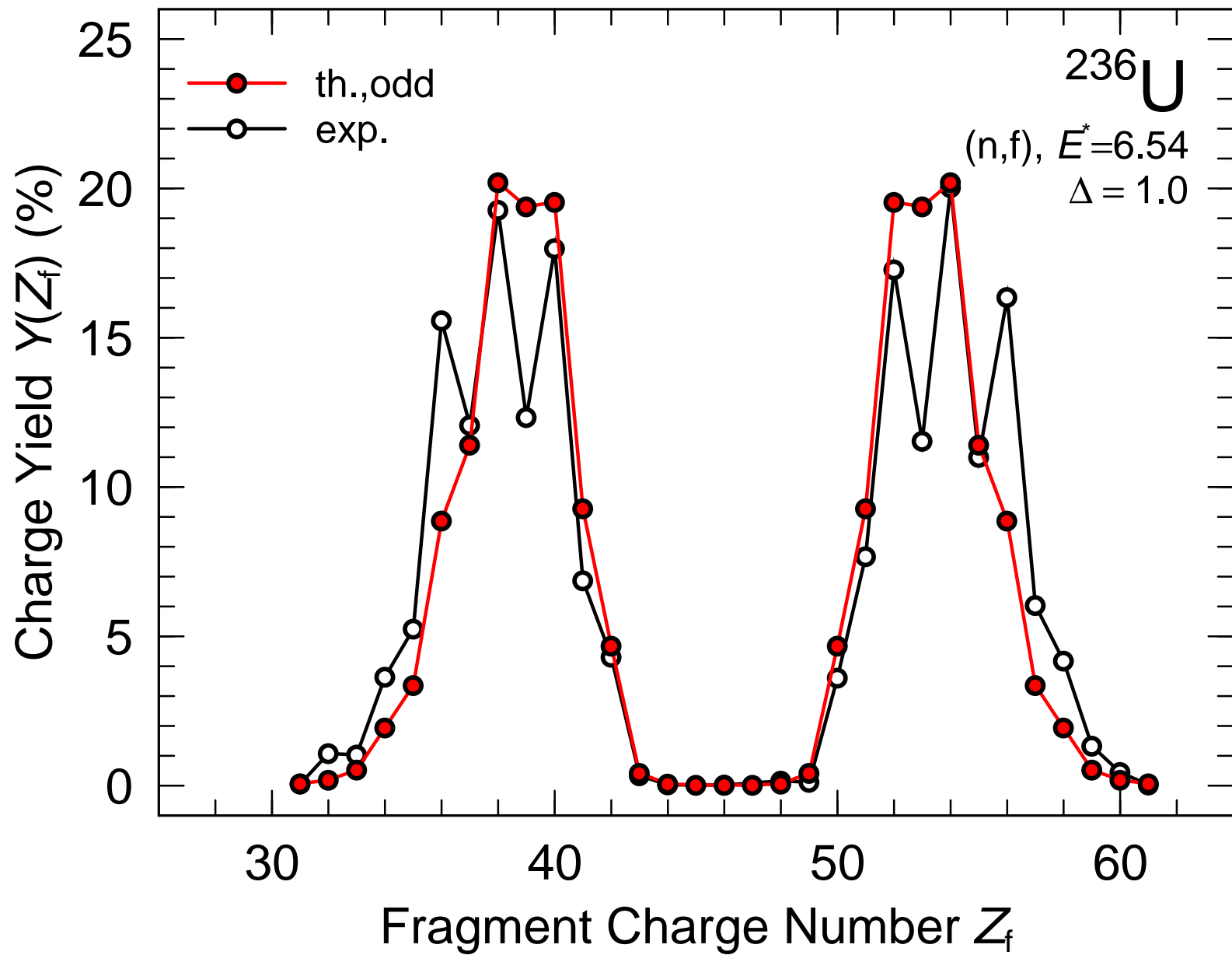
c $\text{IRAN} = 1 + 3 * \text{RAND}(0) - 0.00001$

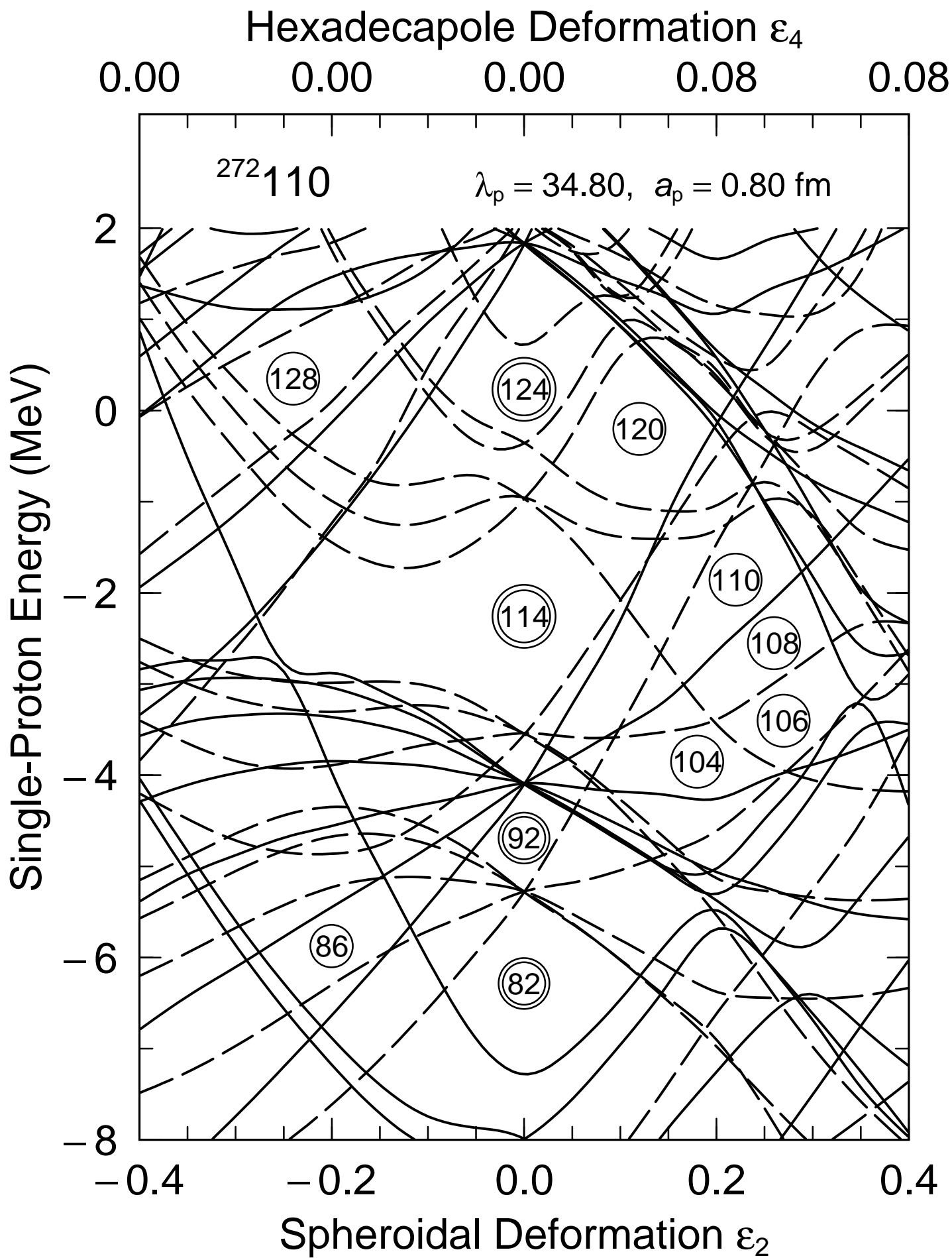
c $\text{NN} = \text{NS} + \text{IRAN} - 2$

$$\text{IRAN} = 1 + 5 * \text{RAND}(0) - 0.00001$$

$$\text{NN} = \text{NS} + \text{IRAN} - 3$$







Z **G R I D**

40	x	x	x	x	x
39	x	X	X	X	x
38	x	X	O	X	x
37	x	X	X	X	x
36	x	x	x	x	x

I-2 I-1 I I+1 I+2 ----> Q

$$\text{IRAN} = 1 + 3 * \text{RAND}(0) - 0.00001$$

$$\text{LN} = \text{LS} + \text{IRAN} - 2$$

c

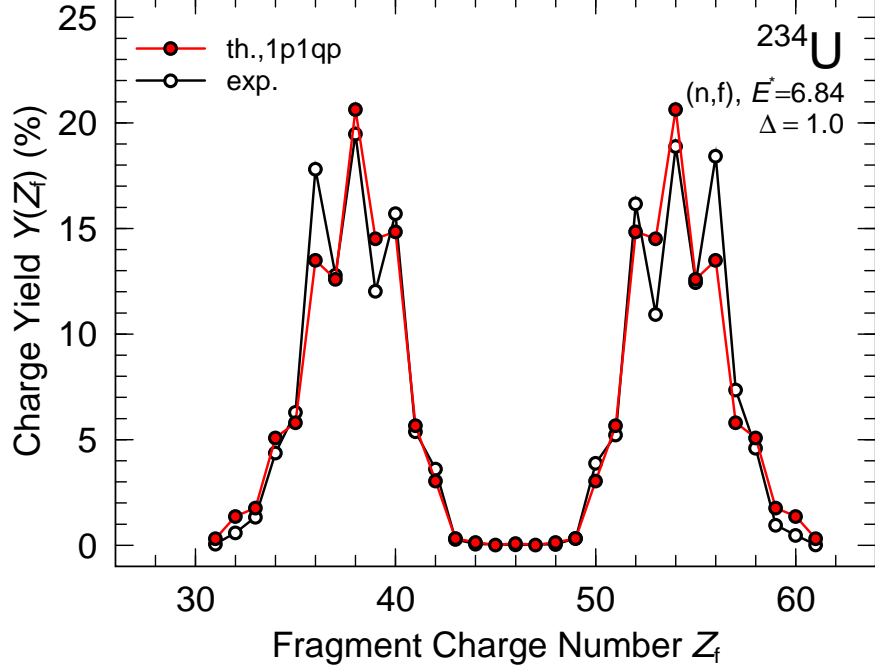
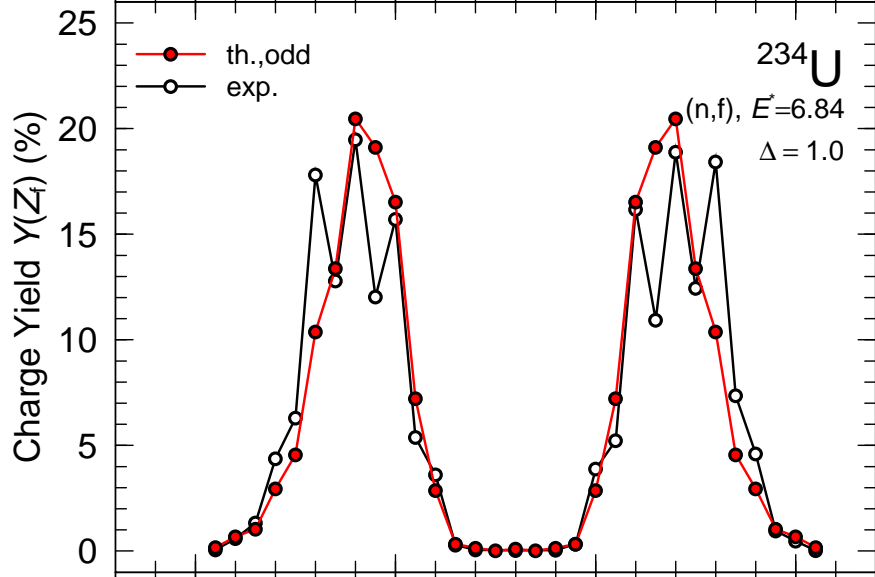
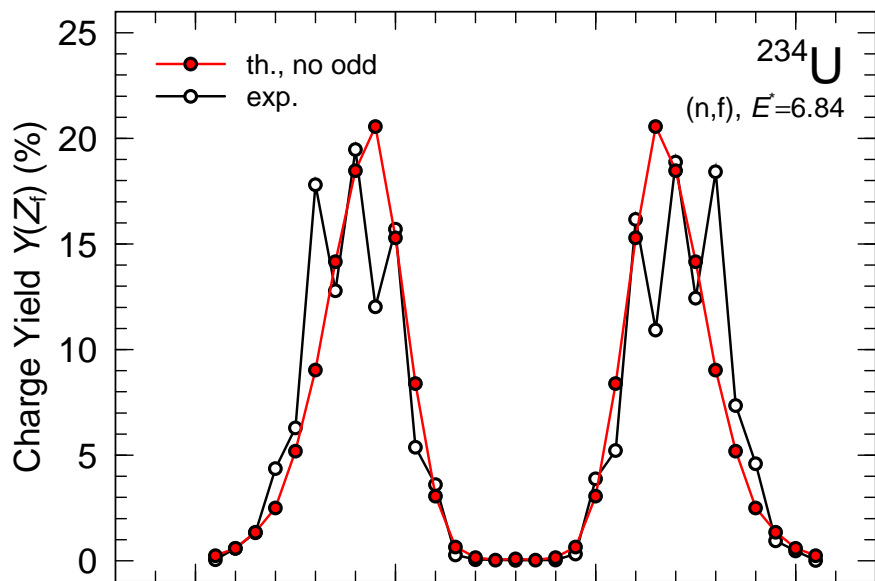
$$\text{IRAN} = 1 + 3 * \text{RAND}(0) - 0.00001$$

c

$$\text{NN} = \text{NS} + \text{IRAN} - 2$$

$$\text{IRAN} = 1 + 5 * \text{RAND}(0) - 0.00001$$

$$\text{NN} = \text{NS} + \text{IRAN} - 3$$



Fragment Charge Number Z_f

$^{92}_{36}\text{Kr}_{56}$

Scale 0.20 (MeV)

