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NPRE 247

Quiz 7

1a) Q = -2.4365 MeV

b) T_thresh = 45.9511 MeV

c) C_thresh = 16.4839 MeV

d) Max b/w B and C, so

overall threshold = 45.9511 MeV

e) Sum of Q and Overall Threshold

43.5146 MeV

In [1]:

```
#Constants

#Mass [Amu]
m_H1 = 1.0078259321
m_O18 = 17.999161
m_n = 1.00866491597

#Conversion
amu_to_MeV = 931.494028

#Energies
e_H1 = m_H1 * amu_to_MeV
e_O18 = m_O18 * amu_to_MeV
e_n = m_n * amu_to_MeV

e_F18 = e_O18 + 1.655
```

In [6]:

```
#A
Q = (e_O18 + e_H1) - (e_F18 + e_n)
Q
```

Out[6]: -2.4365084644923627

In [7]:
```
#B
T_thresh = -(1 + e_O18/e_H1) * Q
T_thresh
```

Out[7]: 45.9510745551666

In [8]:
```
#C
A1 = A2 = 18

Z1 = 8
Z2 = 9

C_thresh = 1.20 * (Z1 * Z2) / (A1**(1/3) + A2**(1/3))
C_thresh
```

Out[8]: 16.483885092767977

In [10]:
```
#D, max between B and C
T_thresh
```

Out[10]: 45.9510745551666

In [12]:
```
#E
T_thresh + Q
```

Out[12]: 43.514566090674236