Modern #6

~~p994 Problem 33~~
p 1038 Problem 33
p 1077 Problems 10, ~~15~~

(3)

p 1038 – Problems

33) How determine λ of e^- in cathode tube if know potential dif of electrodes

$E_i = E_f$

$\frac{1}{2}mv^2 = qV$

(1) ① $v = \sqrt{\frac{2qV}{m}}$

② $\lambda = \frac{h}{p} = \frac{h}{mv} = \frac{h}{\sqrt{m}\sqrt{\frac{2qV}{m}}}$

$\lambda = \frac{h}{\sqrt{2qmV}}$

online want e not q

p 1077 – 10) $^{12}_{6}C$

A) Total binding energy

6 protons, 6 neutrons, 6 electrons

mass = 12.000000 u

(2) ① $\Delta m = m_{pro} + m_{neut} - m_{atom}$

$= 6(1.007825u) + 6(1.008665u) - 12.00000u$

$= .09894\ u$

② $.09894\ u \left(\frac{931\ MeV}{1\ u}\right) = 92.1\ MeV$

B) binding energy per nucleon

$\frac{92.1\ MeV}{12} = 7.68\ MeV/nucleon$