

Joseph Specht

#### Homework 4

1a)  $Q = U-239$

b)  $Q = C-14$

c)  $Q = Rn-222$

d)  $Q = U-234$

2) 931.5 MeV

3a) 7.976 MeV

b) 15.664 MeV

c) 7.751 MeV

d) 4.143 MeV

e) These answers indicate that the extra neutron makes the isotope more unstable than if it had 1 less neutron.

4a) 3.27 MeV released

b) 17.56 MeV released

5) Reactions 1, 4, and 6 are exothermic.

Reactions 2 and 5 are endothermic

Reaction 3 is neither

.1)  $q_1 = 6.586 \text{ MeV}$

.2)  $q_2 = -1.85 \text{ MeV}$

.3)  $q_3 = 0 \text{ MeV}$

.4)  $q_4 = 0.559 \text{ MeV}$

.5)  $q_5 = -12.083 \text{ MeV}$

.6)  $q_6 = 2.125 \text{ MeV}$

6) Reactions 1 and 5 are exothermic

Reactions 3 and 4 are endothermic

Reaction 2 is neither

.1)  $q_1 = 7.250 \text{ MeV}$

.2)  $q_2 = 0 \text{ MeV}$

.3)  $q_3 = -2.726 \text{ MeV}$

.4)  $q_4 = -2.342 \text{ MeV}$

.5)  $q_5 = 4.783 \text{ MeV}$

7a)  $q = 1.820 \text{ MeV}$  (B<sup>+</sup> decay)

b)  $q = 4.9165 \text{ MeV}$  (B<sup>-</sup> decay)