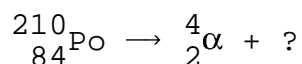


1. Compute the mass defect of a nucleus of ${}_{16}^{32}\text{S}$ whose exact mass is 31.972070 u. Take the mass of a proton to be 1.007825 u and the mass of a neutron to be 1.008665 u.

[1] _____

2. Complete the following nuclear equation.



[2] _____

3. Compute the binding energy per nucleon of a nucleus of ${}_{11}^{23}\text{Na}$ whose exact mass is 22.989767 u. Take the mass of a proton to be 1.0078252 u and the mass of a neutron 1.0086652 u. The mass of u is 1.6604×10^{-27} kg and the speed of light is 2.99793×10^8 m/s.

[3] _____

4. What is the atomic number and atomic mass of the product of a beta plus particle emission from a ${}_{6}^{11}\text{C}$ nucleus?

[4] _____

5. The half-life of ${}^{60}_{27}\text{Co}$ is 5.3 years. If 6400 atoms are initially present, how many remain after 21.2 years?

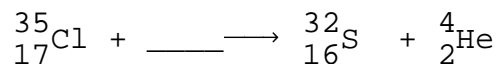
[5] _____

6. Complete the nuclear equation below for beta decay.



[6] _____

7. Determine the missing particle in the following nuclear bombardment equation.



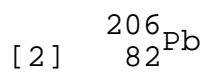
[7] _____

8. An alpha particle is emitted during a radioactive decay of a parent nucleus with an atomic mass number 234. Find the atomic mass number of the daughter nucleus. How many times more kinetic energy does the alpha particle carry away from the decay than does the daughter nucleus?

[8] _____

Key Sheet

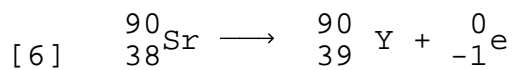
[1] 0.291770 u



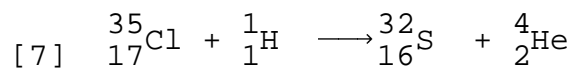
[3] $1.2996 \times 10^{-12} \text{ J}$

[4] 5, 11

[5] 400 atoms



Key Sheet



[8] a) 230, b) 57.5
