

GHW # 1: Chapter 1- Your Name: _____

Key Questions (relatively simple to answer using the Focus Information)

1. What is a nucleosynthesis reaction?
 2. What are following nucleosynthesis reactions?
 - a) Fusion

 - b) Fission

 3. What is the binding energy of an isotope and how it is calculated?

 4. Calculate the binding energy per nucleon (MeV) of ^{56}Fe isotope of mass 55.952918 amu. ($P= 1.007277$ amu, $N= 1.008665$ amu)

 5. How is the chemical elements are created in the Universe?

 6. Complete the following Nuclear reactions:
 - a) Uranium – 238 decays by alpha radiation to produce what other element?

 - b) Thorium – 234 decays by beta radiation to what other element?

 - c) What element did we start out with if the result of beta decay is bismuth– 214?

 - d) What element is produced when mercury – 201 captures an inner shell electron with the production of a gamma ray to release excess energy?

7. What are theories that have been used to describe the nuclear stability?

8. How long would it take for a sample of ^{222}Rn that weighs 0.750 g to decay to 0.100 g?
Assume a half-life for ^{222}Rn of 3.823 days?

9. Describe the Nucleosynthesis of
 - a) Lighter Elements

 - b) Heavier Elements

10. What are the Eight Steps in the History of the Earth?

11. Why is cosmic abundance different from terrestrial abundances?