

Nuclear Decay Homework

Answer the following questions on a separate sheet of paper. Use complete sentences when necessary.

- 1) How does an unstable nucleus release energy?
- 2) What are the three main types of nuclear radiation?
- 3) What part of an atom undergoes change during radioactive decay?
- 4) How is the atomic number of a nucleus changed by alpha decay? By beta decay? By gamma decay?
- 5) How is the atomic mass number of a nucleus changed by alpha decay? By beta decay? By gamma decay?
- 6) Which of the three kinds of radiation described in this section is the most penetrating?
- 7) Complete and balance the equations for the following nuclear reactions.



- 8) Write the symbol and charge for each.
 - a. alpha particle
 - b. beta particle
 - c. gamma ray
- 9) How are the mass number and atomic number of a nucleus affected by the loss of the following?
 - a. Beta particle
 - b. Alpha particle
 - c. Gamma ray

Uranium-238 undergoes the following decay processes as it becomes Lead-206:
 alpha, beta, beta, alpha, alpha, alpha, alpha, alpha, beta, beta, alpha, beta, beta, alpha

Based on this cascade, fill in the blanks to track this transmutation process from U to Pb by taking the product of each decay and make it the starting point for the next decay.

