**CHEMISTRY A Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Period\_\_\_\_\_**

ISOTOPE AND RADIOACTIVITY PRACTICE

1. Consider the atom 32S. How many protons does it have?

16

How many neutrons does it have?

How many electrons does it have?

2. Consider the atom 236U. How many protons does it have?

92

How many neutrons does it have?

How many electrons does it have?

3. Consider the atom 238U. How many protons does it have?

92

How many neutrons does it have?

How many electrons does it have?

4. The atoms in 2 and 3 are of each other.

5. The element Neon has three different isotopes: Ne-20 (90.92%), Ne-21 (0.26%) and Ne-22 (8.82 %). Calculate the average atomic mass for Neon.

6. Copper consists of two isotopes with masses of 63 (70.5%) and 65 (29.5%). Calculate the average atomic mass of copper.

7. Natural radioactive decay will result in a different type of element. List the three types of radiations from a radioactive element, what they are in terms of atomic structure (mass and type of particles) and the result to the atom with each type of emission.

8. A cotton-like piece of fabric from an archeological site in Southern Utah is believed to be from the Fremont Indian culture. The C-14 content in the fabric was found to be ¼ that of living plant tissue today. If the half-life of C-14 is 5,730 years, how old is the piece of fabric?

9. A 20.0 mg sample of mercury-190 is allowed to sit on a shelf for 2 hours. It has a half-life of 20 minutes. How much is left after the two hours?

10. A fossilized piece of wood has a C-14 activity one eighth that of new wood. How old is the piece of wood? C-14 has a half-life of 5730 years.

11. Iodine-131 is an isotope used in the treatment of thyroid cancer. It has a half-life of 8.07 days. How long will it take for a 5 mg sample of I-131 to decay to 1/64th of its original activity?

12. Uranium-238 has a half-life of 4.5 x 109 years. The product of uranium decay is lead-207. The lead content compared to the uranium content in a rock sample is in a ratio of 1:1 (example: 10 atoms of lead to 10 atoms of uranium). How old is the rock sample?