**Salt Lake Community College, Chemistry Department**

**Chem 1110 Workshop 13**

**Topic: Nuclear Chemistry**

***Objective:***

* **To be able to write and balance equations for nuclear reactions**
* **To understand and be able to list the characteristics of the three common kinds of nuclear radiation**
* **To be able to explain half-life and calculate quantity of radioisotope remaining after a given number of half-lives**

**Practice Problems:**

1. The emission of a particle from an unstable nucleus is called \_\_**nuclear decay**\_\_\_\_\_\_\_\_\_\_\_.
2. The change of element into another by the process of nuclear decay is called \_\_\_**transmutation**\_\_\_\_\_\_\_\_\_\_.
3. The term nucleon refers to\_\_\_\_**protons and neutrons**\_\_\_\_\_\_\_\_\_.
4. Radioactivity is generally associated with which part of the atom?

**A) nucleus**

B) electrons

C) protons

D) neutrons

E) the entire atom

5. Which nuclear reaction is **not** balanced?

A) B + He → N + n

**B) U + He → Am + n**

C) Ar + H → K + n

D) N + He → O + H

6. Which product is formed by beta emission from phosphorus -32? The atomic number of phosphorus is 15.

A) Al

B) Al

**C) S**

D) P

E) P

1. What is the missing reactant in the reaction shown?

Al + \_\_\_\_\_\_\_\_ → P + n

**A) He**

B) H

C) H

D) n

E) β

8.Which reaction is an example of a gamma emission?

A) Cm → Pu + He

B) B + n → Li + He

C) U + n → Te + Zr + 2 n

D) Ti → V + β

**E) Sc → Sc + energy**

1. Iodine-131 has a half-life of 8.0 days. If you originally have a 658 g sample of Iodine-131, how much will remain after 32 days?

**(1/2)# of half lives = amount remaining/ original amount**

1 half life = 8.0 days

32 days x 1 half life/ 8.0 days = **4 half lives**

(1/2)4 = x / 658 g

0.0625 = x/ 658 g

**41.1 g = amount remaining**