

Radioactivity

Name - _____

- 1.) What happens when a radioactive atom undergoes radioactive decay?

- 2.) Why are alpha and beta radiation referred to as particles, while gamma radiation is referred to as rays?

- 3.) Write a definition for transmutation in your own words.

- 4.) In the following generic element ${}^Z_A D$ what happens to the atomic number (A) and mass number (Z) during alpha decay?

- 5.) The following parent isotopes undergo alpha decay. Write the nuclear equation for these transmutations.
 - a.) tungsten – 180 _____ → _____
 - b.) samarium – 147 _____ → _____
 - c.) sodium – 20 _____ → _____

- 6.) The mass number of an atom undergoing beta decay does not change. However, the daughter nucleus is a different element than the parent. Explain how this is possible.

- 7.) The following parent isotopes undergo beta decay. Write the nuclear equation for this transmutation.
 - a.) nickel – 64 _____ → _____

b.) tritium _____ → _____

c.) iron – 59 _____ → _____

8.) Iron – 60 undergoes beta decay. The daughter nucleus is in an excited state and undergoes gamma decay.
Write both nuclear equations to show these changes.

9.) State whether the following descriptions apply to alpha, beta or gamma radiation:

a.) has a negative charge _____

b.) is a helium nucleus _____

c.) its path is deflected by a magnet _____

d.) is similar to x-rays _____

e.) is stopped by a few sheets of paper _____

f.) an electric charge does not affect its path _____

g.) has the most mass _____

h.) easily penetrates skin and tissue _____

10.) Complete the following nuclear equations:

