**Worksheet #2**

**Name: Period: Seat#:**

|  |  |  |
| --- | --- | --- |
| 1. A positively charged particle made up of two protons and two neutrons and released by a radioactive nucleus is the: | 1. An electron released by a radioactive nucleus that causes a neutron to change into a proton is called a | 1. The amount of time for half the atoms in a radioactive sample to decay is called |
| 1. The process in which the nuclei of unstable atoms can become more stable by emitting particles and/or electromagnetic radiation is called | 1. High-energy electromagnetic radiation released by a radioactive nucleus is called | 1. What kind of decay is the breaking up of a radioactive element, more often than not resulting in the formation of a new nucleus. |
| 1. What is it called when an atom is changed into another kind of atom that takes place during radioactive decay. | 1. Is Alpha radiation a stream of positively or negatively charged particles? | 1. Is Beta radiation a stream of positively or negatively charged particles? |
| 1. Whenever an element undergoes   decay it turns into another element with an atomic number two less than before and mass number four less than before. | 1. Whenever an element undergoes   decay, a neutron in the nucleus decays into a proton, an electron, and a neutrino. | 1. Circle one:  The more stable a nucleus is, the   *longer shorter*  its half-life will be. |
| 1. Which type of radioactive decay can be stopped with a piece of paper? | 1. Which type of radioactive decay can be stopped with a thin metal sheet? | 1. Which type of radioactive decay can be stopped with a thick metal sheet? |
| 1. Which type of radioactive decay travels at the speed of light? | 1. Which type of radioactive decay is not affected by a magnetic field because it carries no charge? | 1. An alpha particle is actually a nucleus of: |
| 1. Where do beta particles originate from in the atom? | 1. Radioactive decay processes occur until a   Element is formed | 1. True or false? The half-life of a given isotope can be altered by heat, pressure, or some other physical means. |

**Fill in the missing symbol and identify the type of decay taking place.**

|  |  |  |
| --- | --- | --- |
|  | **Reaction** | **Type of Decay** |
| **1** |  |  |
| **2** | 90 |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |
| **11** |  |  |
| **12** |  |  |

**Write and/or complete the following transmutations, fission and fusion reactions.**

1. Neutron initiated fission of U-235 releases 2 neutrons, forms Cs-144 and another nucleus.

1. Bombardment of Cl-35 with a neutron produces a sulfur-34 nucleus and another particle.
2. Neutron initiated fission of U-235 releases 4 β particles, forms Sr-90 and releases another nucleus.
3. Neutron initiated fission of U-235 releases 3 neutrons, one β, forms Br-87 and another nucleus.
4. Neutron initiated fission of Pu-239 gives three neutrons, La-145 and another nucleus.
5. Two tritium nuclei are fused to produce 2 neutrons and another nucleus.
6. An H-1 nucleus (protium) and a Li-7 nucleus are fused to produce He-4.
7. Tritium and deuterium are fused to produce a neutron and a new nucleus.
8. Bombardment of U-238 with C-12 produces an isotope of element 98 and 4 identical particles.