

Name:

Period:

Seat#:

<p>1) A positively charged particle made up of two protons and two neutrons and released by a radioactive nucleus is the:</p>	<p>2) An electron released by a radioactive nucleus that causes a neutron to change into a proton is called a</p>	<p>3) The amount of time for half the atoms in a radioactive sample to decay is called</p>
<p>4) The process in which the nuclei of unstable atoms can become more stable by emitting particles and/or electromagnetic radiation is called</p>	<p>5) High-energy electromagnetic radiation released by a radioactive nucleus is called</p>	<p>6) What kind of decay is the breaking up of a radioactive element, more often than not resulting in the formation of a new nucleus.</p>
<p>7) What is it called when an atom is changed into another kind of atom that takes place during radioactive decay.</p>	<p>8) Is Alpha radiation a stream of positively or negatively charged particles?</p>	<p>9) Is Beta radiation a stream of positively or negatively charged particles?</p>
<p>10) Whenever an element undergoes <div style="border: 1px dashed black; width: 150px; height: 20px; margin: 5px 0;"></div> decay it turns into another element with an atomic number two less than before and mass number four less than before.</p>	<p>11) Whenever an element undergoes <div style="border: 1px dashed black; width: 150px; height: 20px; margin: 5px 0;"></div> decay, a neutron in the nucleus decays into a proton, an electron, and a neutrino.</p>	<p>12) Circle one: The more stable a nucleus is, the <i>longer</i> <i>shorter</i> its half-life will be.</p>
<p>13) Which type of radioactive decay can be stopped with a piece of paper?</p>	<p>14) Which type of radioactive decay can be stopped with a thin metal sheet?</p>	<p>15) Which type of radioactive decay can be stopped with a thick metal sheet?</p>
<p>16) Which type of radioactive decay travels at the speed of light?</p>	<p>17) Which type of radioactive decay is not affected by a magnetic field because it carries no charge?</p>	<p>18) An alpha particle is actually a nucleus of:</p>
<p>19) Where do beta particles originate from in the atom?</p>	<p>20) Radioactive decay processes occur until a <div style="border: 1px dashed black; width: 150px; height: 20px; margin: 5px 0;"></div> Element is formed</p>	<p>21) True or false? The half-life of a given isotope can be altered by heat, pressure, or some other physical means.</p>

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

	Reaction	Type of Decay
1	${}^3_1\text{H} \rightarrow \underline{\hspace{2cm}} + {}^0_{-1}\text{e}$	
2	${}^{232}_{92}\text{U} \rightarrow {}^{228}_{90}\text{Ra} + \underline{\hspace{2cm}}$	
3	${}^{144}_{58}\text{Ce} \rightarrow {}^{144}_{59}\text{Pr} + \underline{\hspace{2cm}}$	
4	${}^{65}_{30}\text{Zn} \rightarrow \underline{\hspace{2cm}} + {}^0_{+1}\text{e}$	
5	${}^{40}_{19}\text{K} \rightarrow {}^{40}_{18}\text{Ar} + {}^0_{+1}\text{e}$	
6	${}^7_4\text{Be}^* \rightarrow {}^7_4\text{Be} + \underline{\hspace{2cm}}$	
7	${}_0^1\text{n} + {}^{235}_{92}\text{U} \rightarrow {}^{236}_{92}\text{U}^* \rightarrow {}^{141}_{55}\text{Cs} + \underline{\hspace{2cm}} + 3{}_0^1\text{n}$	
8	${}^{222}_{86}\text{Rn} \rightarrow \underline{\hspace{2cm}} + {}^4_2\text{He}$	
9	${}^{129}_{53}\text{I} \rightarrow {}^{129}_{54}\text{Xe} + \underline{\hspace{2cm}}$	
10	${}_1^1\text{H} + {}_1^1\text{H} \rightarrow \underline{\hspace{2cm}} + {}^0_{+1}\text{e}$	
11	${}^{239}_{94}\text{Pu} \rightarrow \underline{\hspace{2cm}} + {}^4_2\text{He}$	
12	${}^{15}_8\text{O} \rightarrow {}^{15}_7\text{N} + \underline{\hspace{2cm}}$	

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