

**Alpha, Beta, Gamma! Radioactive Decay**

1. Fill in the blanks of this table:

<table>
<thead>
<tr>
<th>Property</th>
<th>Alpha</th>
<th>Beta</th>
<th>Gamma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particle or Ray?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description of the particle or ray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative Penetration Power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in mass number or the parent nucleus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in Atomic Number to the parent nucleus</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Complete the following radioactive decay equations! Rewrite the equation to show standard atomic notation of the isotopes and radioactive decay products:

   a. Polonium-208 → ______________ + alpha particle
b. Protactinium-231 $\rightarrow$ __________ + Alpha Particle

c. __________ $\rightarrow$ Francium 221 + Alpha Particle

d. __________ $\rightarrow$ Iridium-192 + Alpha Particle

e. __________ $\rightarrow$ Astatine-207 + Alpha Particle

f. Carbon-14 $\rightarrow$ __________ + Beta Particle

g. Helium-6 $\rightarrow$ __________ + Beta Particle

h. Sodium-24 $\rightarrow$ __________ + Beta Particle
i. ___________ → Mercury 201 + Beta Particle

j. ___________ → Cobalt-52 + Beta Particle

k. ___________ → Calcium-42 + Beta Particle

l. Magnesium-24 → ______________ + Gamma Ray

m. ___________ → Californium-254 + Gamma Ray

3. Label these equations as alpha, beta, or gamma
a. Iodine-131 → Xeon-131 + electron
b. Nickel-60 → Nickel-60 + energy
c. Radium 226 → Radon-222 + Helium
d. Protactinium-231 → Actinium 227 + Helium
e. Mercury-201 → Thalium-201 + electron
f. Actinium-225 → Francium-221 + Helium

g. Uranium-238 → Thorium-234 + Helium

h. Potassium-42 → Potassium-42 + energy

i. Polonium-212 → Lead-208 + Helium

j. Strontium 90 → Yttrium-90+ electron

k. Neptunium 239 → Uranium-239 + Electron

4. Differentiate between the equation for a beta decay and one for a gamma decay.

5. Which type of decay loses the most mass?

6. Which type of decay loses the least mass?

7. Tell me in 50 words or less a story about alpha, beta, and gamma and how they met?