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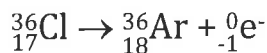
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Radioactive Decay and Half-Lives Worksheet

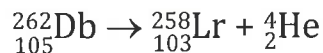
Solve #1-8. For #1-5, write a balanced equation for the nuclear reaction as shown below.

Examples:

Chlorine-36 decays by beta emission



Dubnium-262 decays by alpha emission



1. Krypton-87 decays by beta emission.



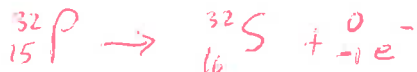
2. Curium-240 decays by alpha emission.



3. Americium-243 decays by alpha emission.



4. Phosphorus-32 decays by beta emission.



5. Lead-210 decays by beta and then alpha emission.



6. The half-life of Iodine-131 is approximately 8 days. If you start with 15 grams of Iodine-131, how much will be left after 24 days?

$$\begin{aligned} \text{Amount remaining} &= \text{Initial amount} \cdot (0.5)^n \\ &= 15\text{g} \cdot (0.5)^3 \end{aligned}$$

$$= 1.875\text{g}$$

$$24\text{ days} = 3\text{ half-lives}$$

7. Thorium-234 has a half-life of 24 days. If 1 gram remains in a sealed container after 72 days, how much was there originally?

$$\text{Amount remaining} = \text{Initial amount} \cdot (0.5)^n$$

$$1\text{g} = x \cdot (0.5)^3$$

$$1\text{g} = 0.125x$$

$$x = 8\text{g}$$

$$72\text{ days} = 3\text{ half-lives}$$

8. The half-life of Polonium-218 is 3.0 minutes. If you start with 20 grams of Po-218, what percentage of the original sample remains after 4 half-lives?

$$(0.5)^n \rightarrow (0.5)^4 = 0.0625 = 6.25\%$$