

Red Hot Half-Life LTF Assessment



1. Determine the half-life of an isotope if 125g of a 500g sample of the isotope remains 3.0 years?

$$500\text{g} \div 2 = \frac{\quad}{\text{Half-Life \#1}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#2}} \text{ g}$$

So, _____ half-lives

$$3.0 \text{ years} \div \frac{\quad}{\text{half-lives}} = \frac{\quad}{\text{years}}$$

- a. 1.5 years
 - b. 2.0 years
 - c. 2.5 years
 - d. 3.5 years
 - e. 4.5 years
2. Approximately how many half-lives have passed when only 10% of the original isotopes remain in a 100g sample?

Step 1: Find 10% of 100g = 100g x _____ = _____ g

$$\text{Step 2: } 100\text{g} \div 2 = \frac{\quad}{\text{Half-Life \#1}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#2}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#3}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#4}} \text{ g}$$

- a. 1.0
 - b. 1.5
 - c. 2.5
 - d. 3.3
 - e. 4.5
3. If a 1000g sample of an isotope decays, how many grams of the original sample remain after exactly 4 half-lives have passed?

$$1000\text{g} \div 2 = \frac{\quad}{\text{Half-Life \#1}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#2}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#3}} \text{ g} \div 2 = \frac{\quad}{\text{Half-Life \#4}} \text{ g}$$

- a. 500g
- b. 250g
- c. 125g
- d. 62.5g
- e. 31.3 g