

Applications of exponents and logs

1. The half-life of Zn-71 is 2.4 minutes. If there was 100.0 g at the beginning of an experiment, how many grams remain after 7.25 minutes has elapsed?
2. Pd-100 has a half-life of 3.6 days. If you have 6.02×10^{23} atoms initially, how many atoms will be present after 20.0 days?
3. Os-182 has a half-life of 21.5 hours. How many grams of a 10.0 gram sample would have decayed after exactly three half-lives?
4. After 24.0 days, 2.00 mg remains from a sample that originally contained 128.0 mg. What is the half-life of the element in the sample?
5. U-238 has a half-life of 4.46×10^9 years. How much U-238 should be present in a sample that is 2.5×10^9 years old if there was 2.00 grams present initially?
6. Fe-253 has a half-life of 0.334 seconds. A radioactive sample is considered to be completely decayed after 10 half-lives. How much time will pass until a sample of this element is completely decayed?

SOLUTIONS

1. 12.5 g
2. $1.28 \times 10^{22} atoms$
3. 8.75 g
4. 4.00 days
5. 1.36 g
6. 3.34 s