

Half-life Problems!!!

1. A radioactive sample of Carbon-14, which is found in all living or once-living things, decays from 35 g of radioactivity to 2.1875 g. How many half-lives did the Carbon-14 undergo?
2. The half-life of Iron-59 is 44.5 days. After 133.5 days, 2.76 g of Iron-59 remain. What was the mass of the original sample?
3. The half-life of Cobalt-60 is 5.3 years. If a sample contains 18 g of radioactive material to begin with, what will be the mass of radioactive Cobalt-60 after 21.2 years?
4. After 36.9 years, a radioactive isotope of Hydrogen, Hydrogen-3, decays from 24 g to 3 g. What is the half-life of Hydrogen-3?
5. A scientist collects a 20-g sample of radioactive Iodine-131. After a time, only 5 g of the sample is radioactive. If the half-life of Iodine-131 is 8.07 days, how long did the scientist allow the sample to decay?

6. A 15-g sample of Thorium-234 decays for 24.1 days. After that time, only 7.5 g of the radioisotope remain. What is the half-life of the isotope?
7. The half-life of Radon-222 is 3.8 days. If a sample currently has 3.1 g of Radon-222, how much did it contain 15.2 days ago?
8. Bananas contain trace amounts of the radioactive isotope Potassium-40. If the half-life of Potassium-40 is 1.28×10^9 years, how long would it take for $10 \mu\text{g}$ to decay to $1.25 \mu\text{g}$?
9. Uranium-235 is the radioisotope used to generate nuclear power. If a sample of Uranium-235 decays from 48.6 g of radioactivity to 12.15 g of radioactivity, how many half-lives occurred?
10. The radioisotope Thorium-230 has a half-life of 75,200 years. If a 3500-g sample decays over 225,600 years, what mass will remain?