

### Decay and Half-Life Practice

- Carbon has three isotopes. Answer the following questions for carbon:
  - Two of the isotopes are stable.  $^{12}\text{C}$  has a mass of 12.000 amu and an abundance of 98.93%.  $^{13}\text{C}$  has a mass of 13.003 amu and an abundance of 1.07%. Determine the average atomic mass of carbon.
  - The third isotope of carbon is  $^{14}\text{C}$ . It decays by beta decay. Write the equation for this decay.
  - $^{14}\text{C}$  has a half-life of 5730 years. How long would it take 150 g of carbon-14 to decay to 2.3 g?
- Polonium-214 undergoes alpha decay. It has a half-life of 164 s.
  - Write the equation for the decay.
  - How much of a 16 g sample of polonium-214 will remain after 10.9 minutes?
- Titanium-43 has a half-life of 506 milliseconds. It decays by emitting a positron.
  - Write the equation for the decay.
  - If 4.5 g remain after 5.06 seconds, what was the mass of the original sample?