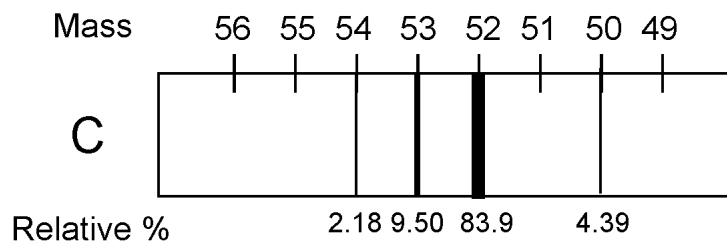
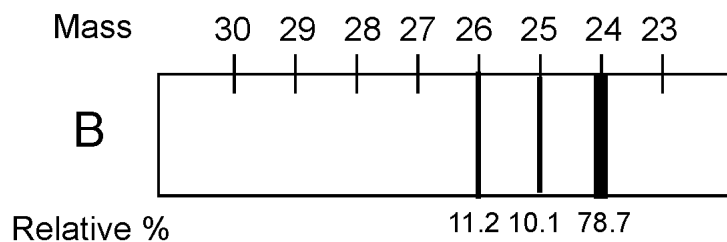
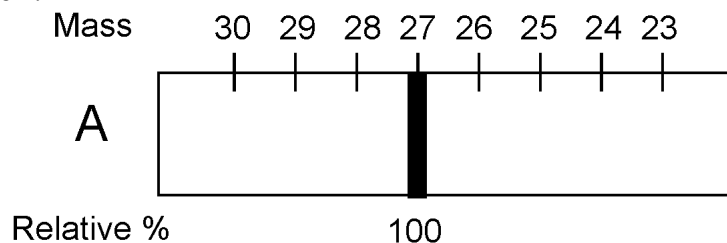


Chemistry – Unit 9 Worksheet 1

Analyzing a Spectrograph

A mass spectrometer is an instrument used to separate an element's isotopes and to measure their relative abundances. Within this device, a sample of an element is vaporized, then ionized and accelerated down a tube. Near the end, the beam of ions is passed through a strong magnetic field which exerts a force on the ions. Ions of greater mass possess more inertia, or more of a tendency to continue to move in a straight line, and so deviate only slightly from their projected path. Ions of lesser mass are more greatly influenced by the field and demonstrate greater deviation. Examine the three mass spectrograph readings illustrated below and answer the questions that follow. Note that the upper scale of each spectrograph shows atomic mass (in amu). Below each spectrograph, the percents of the various isotopes present are given.



1.
 - a. What is the molar mass of the isotope of the element represented by spectrum A?
 - b. What are the name and atomic symbol of element A?

2.
 - a. What are the symbols, including superscripts and subscripts for the isotopes in spectrum B?
 - b. Based on the experimentally obtained values of atomic mass and percent abundance, calculate the average molar mass of this element. Show your work.
 - c. Which isotope deviated most from its straight-line path?

3.
 - a. Calculate the average molar mass of the element in Spectrum C. Show your work.
 - b. What are the symbols, including superscripts and subscripts, of the isotopes of this element?
 - c. Which isotope deviated the least from its straight-line path?