CH 114 Atoms of Crime

1) In the Elements of the Periodic Table activity, question 2 asked you to combine one transition metal and one nonmetal to form the acronym for the analytical technique we used to analyze the ink samples in lab.

    a) What was the acronym?

    b) Name the elements used to spell the acronym.

    c) What is the sum of the protons in the two elements?

2) Chapter 6 opens with a case study asking what killed Napoleon?

    a) What is the name and symbol of the element thought to have poisoned Napoleon?

    b) If an atom of that element contained 41 neutrons, what is the atomic mass of the element?

3) Chapter 6 also begins with a brief analysis of the bullets from the Kennedy assassination.

    a) What are the names and symbols of the two elements whose concentration were analyzed in the bullets?

    b) How many protons, neutrons and electrons does each element contain? Use the mass of the most common isotope.

4) In 2006, ex KGB office Alexander Litvinenko was deliberately poisoned with polonium-210 (someone spiked his tea). Polonium is a radioactive element. It releases alpha particles until it becomes lead. The release of alpha particles inside living cells disrupts the cells leading to death.

   a) How many protons, neutrons and electrons are in polonium-210?

   b) Alpha particles are the same as a helium nucleus (mass = 4). How many protons and neutrons are in an alpha particle?

   c) How many protons, neutrons and electrons are in an atom of lead-208?

5) Most of the naturally occurring carbon is carbon-12. However two other isotopes of carbon exist, carbon-13 and carbon-14. Carbon-14 is used in radioactive carbon dating to estimate the age of artifacts made from wood or cloth.

   a) How do the isotopes of carbon differ from each other?

   b) How are the isotopes of carbon alike?