

SECTION 14-2 REVIEW

EARTH'S HISTORY

VOCABULARY REVIEW Explain the relationship between the terms in each of the following pairs of terms.

- 1. radioactive isotope, radioactive dating _____

- 2. radioactive decay, half-life _____

- 3. microsphere, coacervate _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. The age of Earth is estimated to be
 - a. about 700,000 years.
 - b. about 50 million years.
 - c. about 400 million years.
 - d. more than 4 billion years.
- _____ 2. Sulfur has an atomic number of 16. Therefore, the isotope sulfur-35 has
 - a. 19 protons and 16 neutrons.
 - b. 35 protons and 16 neutrons.
 - c. 16 protons and 19 neutrons.
 - d. 16 protons and 35 neutrons.
- _____ 3. When performing radioactive dating, scientists measure the
 - a. number of protons and neutrons in the nucleus of a radioactive isotope.
 - b. amount of a particular radioactive isotope contained in a material.
 - c. age of a living organism that is exposed to radioactive isotopes.
 - d. rate at which the mass of an object decreases over time.
- _____ 4. Carbon-14 dating is useful for estimating the age of
 - a. relatively young organic material.
 - b. old rocks.
 - c. Earth.
 - d. the solar system.
- _____ 5. Researchers using the technique of Miller and Urey have been able to produce
 - a. amino acids and nucleotides.
 - b. proteins and DNA.
 - c. ATP and mitochondria.
 - d. cell membranes and simple cells.

SHORT ANSWER Answer the questions in the space provided.

1. Explain how the half-life of a radioactive isotope affects the usefulness of that isotope in dating specific types of rocks. _____

2. Why do some scientists think that areas protected from the atmosphere might have favored the production of organic compounds on early Earth? _____

3. Why was the discovery of microspheres and coacervates an important contribution to the understanding of how life might have originated on Earth? _____

4. **Critical Thinking** Does radioactive dating with isotopes of uranium and thorium provide an estimate of the beginning, middle, or end of the period of Earth's formation? Explain your answer. _____

STRUCTURES AND FUNCTIONS Use the figure to answer the following question.

The graph below represents the radioactive decay of an isotope. If the half-life of thorium-230 is 75,000 years, how old is a rock that contains only 1/16th of its original thorium-230? Show your calculations in the space below.

