

Stoichiometry-Based Assessment

Answer the following items on a separate piece of paper.

MULTIPLE CHOICE

1. A chemical compound always has the same elements in the same proportions by mass regardless of the source of the compound. This is a statement of
 - A. the law of multiple proportions.
 - B. the law of isotopes.
 - C. the law of definite proportions.
 - D. the law of conservation of mass.
2. An important result of Rutherford's experiments with gold foil was to establish that
 - A. atoms have mass.
 - B. electrons have a negative charge.
 - C. neutrons are uncharged particles.
 - D. the atom is mostly empty space.
3. Which subatomic particle has a charge of +1?
 - A. electron
 - B. neutron
 - C. proton
 - D. meson
4. Which particle has the least mass?
 - A. electron
 - B. neutron
 - C. proton
 - D. All have the same mass.
5. Cathode rays are composed of
 - A. alpha particles.
 - B. electrons.
 - C. protons.
 - D. neutrons.
6. The atomic number of an element is the same as the number of
 - A. protons.
 - B. neutrons.
 - C. protons + electrons.
 - D. protons + neutrons.
7. How many neutrons are present in an atom of tin that has an atomic number of 50 and a mass number of 119?
 - A. 50
 - B. 69
 - C. 119
 - D. 169

8. What is the mass of 1.50 mol of sodium, Na?
 - A. 0.652 g
 - B. 0.478 g
 - C. 11.0 g
 - D. 34.5 g
9. How many moles of carbon are in a 28.0 g sample?
 - A. 336 mol
 - B. 72.0 mol
 - C. 2.33 mol
 - D. 0.500 mol

SHORT ANSWER

10. Which atom has more neutrons, potassium-40 or argon-40?
11. What is the mass of 1.20×10^{23} atoms of phosphorus?

EXTENDED RESPONSE

12. Cathode rays emitted by a piece of silver and a piece of copper illustrate identical properties. What is the significance of this observation?
13. A student believed that she had discovered a new element and named it mythium. Analysis found it contained two isotopes. The composition of the isotopes was 19.9% of atomic mass 10.013 and 80.1% of atomic mass 11.009. What is the average atomic mass, and do you think mythium was a new element?



Test Tip

Choose the best possible answer for each question, even if you think there is another possible answer that is not given.