

CHEM: Chemistry Diagnostic Test
Placement Test Study Guide
CHEM 51, 1A, 4A

TYPICAL QUESTIONS FROM COMPETENCY AREAS:

(A Periodic Table including atomic weights will be furnished during the Chemistry Diagnostic Test)

Compounds

1. The number of atoms of all varieties contained in one molecule of benzophenone, $(C_6H_5)_2CO$ is:
- a) 3 b) 14 c) 15 d) 24

States

2. The process in which water changes from the solid state into the gaseous state, by passing the liquid phase, is known as:
- a) Condensation b) Evaporation c) Sublimation d) Deposition

Reactions

3. When methane gas (CH_4) is completely combusted with oxygen gas (O_2), the product(s) is (are):
- a) CO_2 and H_2O b) CO and H_2O_2 c) C and H_2O d) CH_4O_2

Periodicity

4. Which set of elements would have an identical number of valence electrons?
- a) Na, Mg, Al b) C, Si, Ge c) S, Cl, Ar d) Fe, Co, Ni

Structure

5. Which of the following molecules would have a three dimensional structure known as a tetrahedral?
- a) H_2O b) CH_4 c) NH_3 d) SF_4

Solutions

6. How many milliliters of water must be added to 100mL of 12.6 M H_2SO_4 to create 4.2 M H_2SO_4 ?
- a) 300 mL b) 33 mL c) 400 mL d) 200 mL

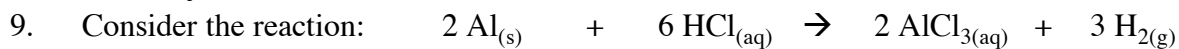
Dynamics

7. A reaction in which the products are formed at a higher potential energy state than that of the initial reactants would be a reaction in which:
- a) heat is evolved b) the reactants and products are neutral
c) the reaction process is endothermic d) the activation energy has a negative value

Lab Skills

8. Acid-base titrations are performed in the laboratory primarily using which volume measuring device?
- a) Buret b) beaker c) volumetric flask d) graduated cylinder

Stoichiometry



How many grams of $\text{H}_{2(g)}$ can be expected from a reaction in which 13.49 g of $\text{Al}_{(s)}$ react with excess $\text{HCl}_{(aq)}$ to produce products?

- a) 0.672 g b) 13.49 g c) 1.51 g d) 0.50 g

ANSWERS TO SAMPLE QUESTIONS CHEMISTRY DIAGNOSTIC TEST

- | | |
|------------------|-----|
| 1) COMPOUNDS | (D) |
| 2) STATES | (C) |
| 3) REACTIONS | (A) |
| 4) PERIODICITY | (B) |
| 5) STRUCTURE | (B) |
| 6) SOLUTIONS | (D) |
| 7) DYNAMICS | (C) |
| 8) LAB SKILLS | (A) |
| 9) STOICHIOMETRY | (C) |