

CHEMISTRY DIAGNOSTIC TEST
Study Guide

CHEM 1A and CHEM 4A have a prerequisite of CHEM 42. Students who think they may be ready for CHEM 1A or CHEM 4A without completing CHEM 42 should take the Chemistry Diagnostic Test **and** complete the Review Questionnaire Form at the Student Success and Assessment Services Office.

TYPICAL QUESTIONS FROM THE CHEMISTRY DIAGNOSTIC TEST

(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

9. Consider the reaction: $2 \text{Al}_{(s)} + 6 \text{HCl}_{(aq)} \rightarrow 2 \text{AlCl}_{3(aq)} + 3 \text{H}_{2(g)}$
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 STUDY GUIDE

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|------------------|-----|
| 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) |