

Chemistry 12

Unit II: Dynamic Equilibrium Learning Log

The following table contains all the prescribed learning outcomes for the Dynamic Equilibrium unit of Chemistry 12. Use this table to help you stay organized and on track throughout the unit. Use it along with the Equilibrium Study Guide to determine your level of competence and understanding of each learning outcome. Once you are confident that you completely understand each learning outcome, place a check mark in the square provided.

| Essential Learning Goals | Achievement Indicators | Practice | Evidence | Study Guide Equivalent | Status |
|--|--|---------------------------|----------|------------------------|--------------------------|
| B1: Explain the concept of chemical equilibrium with reference to reacting systems. | Describe the reversible nature of most chemical reactions and how it can be represented on a PE diagram | II. 1 and II.2 #1 – 13 | Quiz #1 | D1 & D2 | <input type="checkbox"/> |
| | Describe the dynamic nature of chemical equilibrium. | | | D5 | <input type="checkbox"/> |
| | Relate the changes in rates of the forward and reverse reactions to the changing concentrations of the reactants and products as equilibrium is established | | | D3 | <input type="checkbox"/> |
| | Describe chemical equilibrium as a closed system at constant temperature: - whose macroscopic properties are constant - where the forward and reverse rates are equal - that can be achieved from either direction - where the concentrations of reactants and products are constant. | | | D4 | <input type="checkbox"/> |
| | Infer that a system not at equilibrium will tend to move toward a position of equilibrium. | | | D6 | <input type="checkbox"/> |
| B2: Predict, with reference to entropy and enthalpy, whether reacting systems will reach equilibrium. | Explain the significant of enthalpy and entropy. | II. 3 #14 – 16 | Quiz #1 | D8 | <input type="checkbox"/> |
| | Determine entropy and enthalpy changes from a chemical equation (qualitatively) | | | D7 | <input type="checkbox"/> |
| | Predict the results when entropy and enthalpy factors: - both favour the products - both favour the reactants - oppose one another | | | D9 | <input type="checkbox"/> |
| B3: Apply Le Chatelier's principle to the shifting of equilibrium. | Explain the term shift as it applies to equilibria | II. 4 #17 – 28 | Quiz #2 | E1 | <input type="checkbox"/> |
| | Describe shifts resulting from the following: - temperature change - concentration change - volume change of gaseous systems | | | E2 | <input type="checkbox"/> |
| | Explain equilibrium shifts using the concepts of reaction kinetics | | | E3 | <input type="checkbox"/> |
| | Identify the effect of a catalyst on dynamic equilibrium | | | E4 | <input type="checkbox"/> |

| | | | | | |
|---|---|-----------------------|---------|-----|--------------------------|
| B4: Apply the concept of equilibrium to a commercial or industrial process. | Describe the Haber process for the production of ammonia (NH ₃) | II. 5 #30 | Quiz #2 | E5 | <input type="checkbox"/> |
| Mid Unit Test (includes Essential Learning Goals B1 – B4) | | | | | |
| B5: Draw conclusions from the equilibrium constant expression. | Gather and interpret data on the concentration of reactants and products of a system at equilibrium | II. 6 – 7 #31 – 46 | Quiz #3 | F1 | <input type="checkbox"/> |
| | Write the expression for the equilibrium constant when given the equation for either a homogeneous or heterogeneous equilibrium system | | | F2 | <input type="checkbox"/> |
| | Explain why certain terms (i.e. pure solids and liquids) are not included in the equilibrium constant expression | | | N/A | <input type="checkbox"/> |
| | Relate the equilibrium position to the value of K _{eq} and vice versa | | | F3 | <input type="checkbox"/> |
| | Predict the effect (or lack of effect) on the value of K _{eq} of changes in the following factors: - temperature - pressure - concentration - surface area - catalyst | | | F4 | <input type="checkbox"/> |
| B6: Perform calculations to evaluate the changes in the value of K _{eq} and in concentrations of substances within an equilibrium system. | Perform calculations involving the value of K _{eq} and the equilibrium concentration of all species. | II. 8 #47 – 65 | Quiz #3 | F5 | <input type="checkbox"/> |
| | Perform calculations involving the value of K _{eq} , the initial concentrations of all species, and one equilibrium concentration | | | F6 | <input type="checkbox"/> |
| | Perform calculations involving the equilibrium concentrations of all species, the value of K _{eq} , and the initial concentrations | | | F7 | <input type="checkbox"/> |
| | Determine whether a system is at equilibrium, and if not, in which direction it will shift to reach equilibrium when given a set of concentrations for reactants and products | | | F8 | <input type="checkbox"/> |
| End of Unit Test (includes ALL Essential Learning Goals) | | | | | |

Note: The Chemistry 12 Study Guides are based on OLD PLO's. Use the "Study Guide Equivalent" column to match up old PLO's to the new ones.

For example, essential learning goal B1: "Explain the concept of chemical equilibrium with reference to reacting systems" matches up to D1-D6 on study cards and review questions.