Chapter 16- Chemical Equilibrium

16.1 The Concept of Equilibrium

What is a reversible reaction? What is unique about how reversible reactions are written?

How can the kinetic theory be used to explain how reaction rates increase with an increase in concentration?

Describe chemical equilibrium.

How is chemical equilibrium analogous to predator-prey relationships discussed in biology (p.539)?

16.2 The Law of Chemical Equilibrium

What is the law of mass action?

Write the equilibrium expression for the following reaction:

$aA + bB \Leftrightarrow cC + dD$

What is the significance of the equilibrium constant (K_{eq})?

Why is the equilibrium constant not affected by initial concentrations?

Does the magnitude of the equilibrium constant help predict the rate of a reaction? Explain.

What information do the following K_{eq} values provide?

a) $K > 1$

b) $K = 1$

c) $K < 1$

Distinguish between homogeneous and heterogeneous equilibria.

Why is it solids and liquids are not included in equilibrium expressions?

** Do Practice Problems 3 and 4.*

What is the importance of the reaction quotient?

Which direction will the equilibrium position shift for the reactions described below?

a) $Q < K_{eq}$

b) $Q > K_{eq}$

c) $Q = K_{eq}$

** Do Practice Problems 5 and 6.*

16.3 Le Chatelier's Principle

What is Le Chatelier's principle?

How do the following impositions affect a system at equilibrium?

a) Change in concentration

b) Change in pressure

c) Effect of changing temperature

What is the Haber process? Why is an understanding of chemical equilibrium and Le Chatelier's principle essential to the industrial production of ammonia?