Ch 18 Review pages answers (page #’s 193-198)

18.1

1. Rates of chemical change are usually expressed as the amount of reactant changing per unit time.

2. reactant, product

3. Collision theory states that the particles must have enough kinetic energy when they collide to form products.

4. ineffective collision, effective collision

5. True

6. c

7. b

8. peak

10. It is called the transition state because an activated complex is unstable and is as likely to re-form reactants as it is to form products.

11. temperature, concentration, particle size

12. increase

13. The concentration of reactants increases, the collision frequency increases, and therefore, the reaction rate increases.

14. True

16. catalyst

17. A catalyst permits reactions to proceed at a lower energy than is normally required. A catalyst lowers the activation energy.

18. without, with

19. The catalyst lowers the activation energy and, thus, the amount of energy required by the system.

18.2

1. In reversible reactions, 2 opposite reactions occur simultaneously.

2. False

3. concentrations

4. 3, not at equilibrium, at equilibrium, not at equilibrium

5a) right

b) There is twice as much SO2 as O2 and no SO3

c) SO3 because it has the greatest concentration at equilibrium.

6. Le Chatelier’s principle states that if a stress is applied to a system in dynamic equilibrium, the system changes to relieve the stress.

7. c and d

8. reactants, products

9. true

10. An increase in pressure results in a shift in the equilibrium position that favours the formation of a smaller volume of gas.

11. the reactants

12. product, reactant, moles

13. The exponents are the coefficients from the balanced chemical equation.

14. The square brackets indicate the concentrations of substances in moles per litre.

15. True

16. products, reactants, reactants, products

18.3

1. The solubility product constant equals the product of the concentration terms each raised to the power of the coefficient of the substance in the dissociation equation.

2. Compounds of the alkali metals and of ammonium ions are exceptions.

3. silver chromate

4. salts

5. False

6. precipitate