Chapter 6 Practice Problem Key

**6.43** Use conversion factors to solve the problems.









**6.51** Draw an energy diagram to fit each description.







**6.55** Collision orientation affects the rate of reaction because reacting molecules must have the proper orientation for new bonds to form.

**6.57** Increasing temperature increases the number of collisions, and thereby increases the reaction rate. Since the average kinetic energy of the colliding molecules is larger at higher temperatures, more collisions are effective at causing reaction.

**6.63** A catalyst increases the reaction rate (a) and lowers the *E*a (c). It has no effect on Δ*H* (b), *K* (d), or the relative energies of the reactants and products (e).

**6.69** *K* > 1 is associated with a negative value of Δ*H.* A *K* < 1 means Δ*H* has a positive value.

**6.73** Write the expression for the equilibrium constant as in Answer 6.15.



**6.77**

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|  | b. The reactants are favored at equilibrium since *K* < 1.c. Δ*H* is predicted to be positive since *K* < 1.d. The reactants are lower in energy since the reactants are favored at  equilibrium.e. You can’t predict the reaction rate from the value of *K*. |

**6.83** UseLe Châtelier’s principle to predict the effect of each change.

a. decrease [O3], shift to right d. decrease temperature, shift to left

b. decrease [O2], shift to left e. add a catalyst, no change

c. increase [O3], shift to left f. increase pressure, shift to right

**6.95** Use conversion factors to solve the problem.

