Le Chatelier's Principle Worksheet and Key

1. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$2CO_{(g)} + O_{2(g)} \rightleftarrows 2CO_{2(g)}$$

   a. The amount of O_2 is increased.
   b. The amount of CO_2 is decreased?
   c. The amount of oxygen gas is decreased.

2. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$C_{(s)} + H_2O_{(g)} \rightleftarrows CO_{(g)} + H_{2(g)}$$

   a. adding $\mathbf{H_2O_{(g)}}$

   b. removing carbon

   c. removing H_2

   d. adding carbon

3. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$PCl_{5(g)} \rightleftarrows PCl_{3(g)} + Cl_{2(g)}$$

   a. adding PCl_3

   b. removing Cl_2

   c. removing PCl_3

   d. adding Cl_2

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1. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$2CO_{(g)} + O_{2(g)} \rightleftarrows 2CO_{2(g)}$$

   a. The amount of O_2 is increased. **forward**
   b. The amount of CO_2 is decreased? **forward**
   c. The amount of oxygen gas is decreased. **reverse**

2. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$C_{(s)} + H_2O_{(g)} \rightleftarrows CO_{(g)} + H_{2(g)}$$

   a. adding **$H_2O_{(g)}$** **forward**

   b. removing carbon **reverse**

   c. removing H_2 **forward**

   d. adding carbon **forward**

3. If the reaction below is initially at equilibrium, and then each of the following changes are made, predict which direction the reaction rate will be fastest until equilibrium is once again established: **forward, reverse, or no change.**

$$PCl_{5(g)} \rightleftarrows PCl_{3(g)} + Cl_{2(g)}$$

   a. adding PCl_3 **reverse**

   b. removing Cl_2 **forward**

   c. removing PCl_3 **forward**

   d. adding Cl_2 **reverse**