Mild Worksheet Le Châtlier's Principle

Explain how the following changes in reaction conditions will affect the position of the equilibrium below, and explain your reasoning.

$$A_{(g)} + B_{(aq)} \leftrightarrow C_{(s)} + \Delta H$$

1) The pressure of A in the reaction chamber is increased.

2) The temperature of the reaction is increased by 20^0 C.

3) A catalyst is added to the system.

4) As the reaction progresses, more of compound B is steadily added to the reaction chamber.

5) As the reaction progresses, more of compound B is steadily removed from the reaction chamber.

6) Argon gas is added to the reaction chamber, doubling the pressure.

Le Châtlier's Principle – Answers

Explain how the following changes in reaction conditions will affect the position of the equilibrium below, and explain your reasoning.

$$A_{(g)} + B_{(aq)} \leftrightarrows C_{(s)} \quad \Delta H_{rxn} = -453 \text{ kJ/mol}$$

1) The pressure of A in the reaction chamber is increased.
The reaction is pushed toward products.

2) The temperature of the reaction is increased by 20^0 C.
Because heat can be thought of as being a product, the reaction will be pushed toward reactants.

3) A catalyst is added to the system.
No change. A catalyst doesn't change the equilibrium position, it only changes how quickly equilibrium is reached.

4) As the reaction progresses, more of compound B is steadily added to the reaction chamber.
The reaction is pushed toward products.

5) As the reaction progresses, more of compound B is steadily removed from the reaction chamber.
The reaction is pushed toward the reactants.

6) Argon gas is added to the reaction chamber, doubling the pressure.
No change. If the partial pressure of gaseous compounds is changed, the equilibrium will shift position. However, adding argon gas doesn't change the partial pressures of A, so the equilibrium position is unaffected.

