

Chemistry in Society

Worksheet 3

1. Cl2(g) +H2O(l) 🡪 Cl-(aq) + ClO-(aq) + 2H+(aq)

The addition of which substance would move the equilibrium to the right?  
A Hydrogen

B Hydrogen chloride

C Sodium hydroxideD Sodium chloride

1. Ammonia gas (NH3) is formed when hydrogen gas and nitrogen gas are reacted under certain conditions.

The balanced equation is:

N2(g) + 3H2(g) ↔ 2NH3(g) ΔH = −92.4 kJ·[mol](http://en.wikipedia.org/wiki/Mole_(unit))−1

Outline the effect on the above system at equilibrium if:

1. The pressure inside the reaction vessel is increased.   
   MOVES TO THE RIGHT/FORWARD REACTION FAVOURED
2. Hydrogen gas is added to the reaction vessel.  
   MOVES TO THE RIGHT/FORWARD REACTION FAVOURED
3. The temperature was increased.  
   MOVES TO THE LEFT /REVERSE REACTION FAVOURED

For each of the following equilibria state the shift in position of equilibrium when the stated change is made.

1. Ca(HCO3)2(aq)  CaCO3 (s) + CO2 (g) + H2O (g)

a) increase in concentration of Ca(HCO3)2 (aq)  
 Equilibrium will shift to right

b) removal of CO2 (g)

Equilibrium will shift to right

2. BiCI3 (s) + H2O (l)  BiOCI (s) + 2HCI (aq)

a) increase in concentration of HCI

Equilibrium will shift to left

b) addition of water

Equilibrium will shift to right

3. NH4CI (s)  NH3 (g) + HCI (g)

a) removal of NH3

Equilibrium will shift to right

b) increase in pressure

Equilibrium will shift to left

4. 2SO2 (g) + O2 (g)  2SO3 (g) ΔH is negative (forward reaction)

a) increase in pressure

Equilibrium will shift to right

b) decrease in temperature

Equilibrium will shift to right

c) addition of SO2 (g)

Equilibrium will shift to right

5. BaCI2 (aq) + H2SO4 (aq)  BaSO4 (s) + 2HCI (aq)

a) decrease in concentration of HCI

Equilibrium will shift to right

b) increase in concentration of BaCI2

Equilibrium will shift to right

6. C (s) + H2O (g)  CO (g) + H2 (g)

a) decrease in pressure

Equilibrium will shift to right

b) removal of H2 (g)

Equilibrium will shift to right

7. PCI5 (g)  PCI3 (g) + CI2 (g) ΔH is positive (forward)

a) increase in temperature

Equilibrium will shift to right

b) increase in pressure

Equilibrium will shift to left

8. 3CH4 (g) C3H6 (g) + 2H2 (g) ΔH is positive (forward)

a) decrease in temperature

Equilibrium will shift to left

b) increase in pressure

balanced