7. Equilibria

Starter Quiz ·

A-Level Chemistry Name: _____ Score: _____

1. A reversible reaction is one that:

   ☐ can go both forwards and backwards

   ☐ gives off no energy

   ☐ never reaches equilibrium

   ☐ only goes forwards

2. Le Chatelier's principle says that a change to a system at equilibrium causes it to:

   ☐ explode

   ☐ stop reacting

   ☐ shift to oppose (reduce) that change

   ☐ shift to increase that change

3. In the expression for Kc, the concentrations of the products are:

   ☐ on the top, raised to the powers from the equation

   ☐ added to the reactants

   ☐ on the bottom

   ☐ ignored

4. The Haber process makes:

   ☐ sulfur trioxide

   ☐ sulfuric acid

   ☐ oxygen

   ☐ ammonia, from nitrogen and hydrogen

5. In the Brønsted–Lowry theory, an acid is a:

   ☐ electron acceptor

   ☐ proton donor

   ☐ proton acceptor

   ☐ electron donor

6. A weak acid fully ionises in water.

   ☐ True ☐ False

7. An indicator is used to find the end point of a titration.

   ☐ True ☐ False

8. A closed system is needed to reach equilibrium.

   ☐ True ☐ False

9. Increasing the pressure shifts equilibrium towards the side with more gas molecules.

   ☐ True ☐ False

10. Kp is written using partial pressures rather than concentrations.

    ☐ True ☐ False

A-Level Chemistry

1. **can go both forwards and backwards**

   A reversible reaction (⇌) can form products and turn them back into reactants.

2. **shift to oppose (reduce) that change**

   The equilibrium position always moves in the direction that lessens the change you made.

3. **on the top, raised to the powers from the equation**

   Kc = [products]^powers / [reactants]^powers, with the powers taken from the balanced equation.

4. **ammonia, from nitrogen and hydrogen**

   The Haber process makes ammonia: $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (exothermic).

5. **proton donor**

   A Brønsted–Lowry acid donates a proton (H^+); a base accepts one.

6. **False**

   False. A weak acid only partially ionises in water; a strong acid fully ionises.

7. **True**

   It changes colour at neutralisation.

8. **True**

   If the system were open, products could escape and the forward and reverse rates could never balance.

9. **False**

   False. By Le Chatelier's principle, higher pressure shifts equilibrium towards the side with fewer gas molecules, which reduces the pressure.

10. **True**

    For gas-phase equilibria, Kp uses the partial pressures of the gases.