7. Equilibria

Starter Quiz · 课前小测

A-Level Chemistry Name: ______________ Score: ______

1. A reversible reaction is one that:
   - ☐ can go both forwards and backwards
   - ☐ only goes forwards
   - ☐ never reaches equilibrium
   - ☐ gives off no energy
2. Le Chatelier's principle says that a change to a system at equilibrium causes it to:
   - ☐ shift to oppose (reduce) that change
   - ☐ shift to increase that change
   - ☐ stop reacting
   - ☐ explode
3. In the expression for Kc, the concentrations of the products are:
   - ☐ on the top, raised to the powers from the equation
   - ☐ on the bottom
   - ☐ ignored
   - ☐ added to the reactants
4. The Haber process makes:
   - ☐ ammonia, from nitrogen and hydrogen
   - ☐ sulfur trioxide
   - ☐ sulfuric acid
   - ☐ oxygen
5. In the Brønsted–Lowry theory, an acid is a:
   - ☐ proton donor
   - ☐ proton acceptor
   - ☐ electron donor
   - ☐ electron acceptor
6. A closed system is needed to reach equilibrium.

   ☐ True ☐ False

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

☐ True ☐ False

8. At dynamic equilibrium the forward and backward reactions occur at equal rates.

☐ True ☐ False

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

☐ True ☐ False

10. The equilibrium constant in terms of concentrations is written as _________.

____

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. **True**

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

7. **True**

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

8. **True**

   Concentrations stay constant.

9. **True**

   Le Chatelier's principle.

10. **Kc**

    Kc = products over reactants, each raised to its mole number.