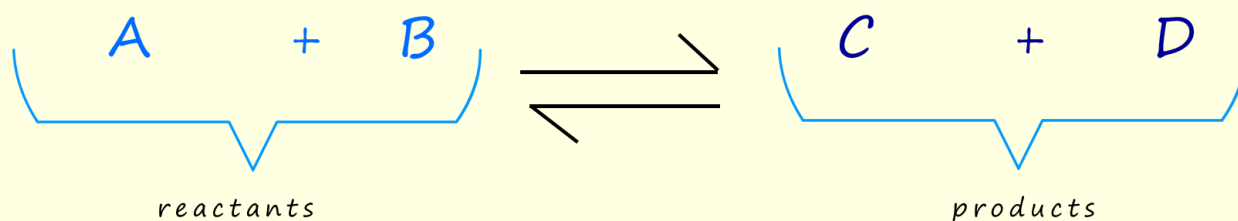
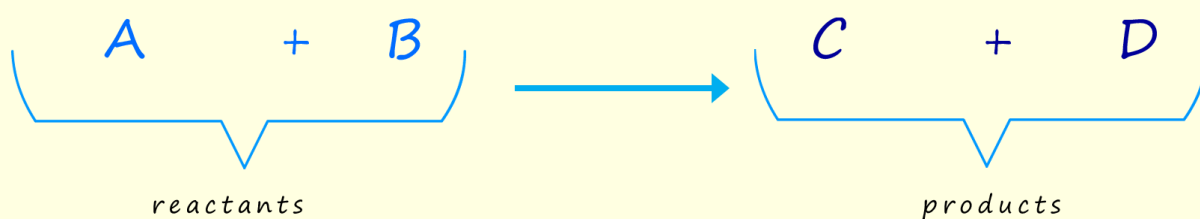


Reversible reactions and equilibrium



1. What is the difference between the two equations below?

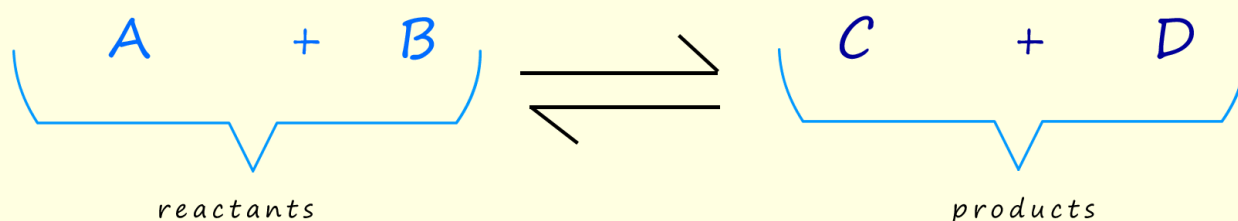
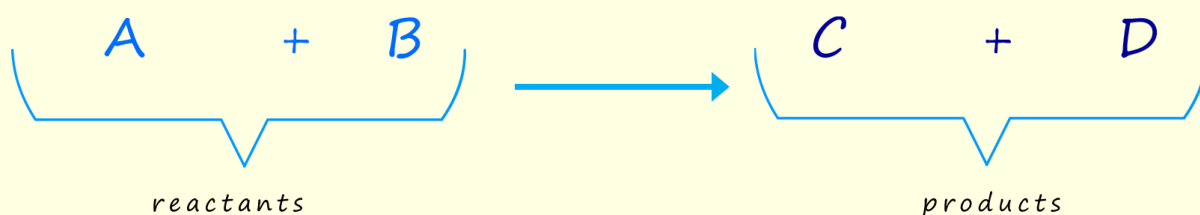


2. What symbol is used to show a reversible reaction?
3. What is the name for the state reached in a reversible reaction when the rates of the forward and backward reactions are equal?
- b. What is meant by dynamic equilibrium?
4. True or False: At dynamic equilibrium, the concentrations of reactants and products are always equal.
5. Describe what is meant by a reversible reaction.
6. In a closed system, how does the concentration of reactants and products change as a reversible reaction reaches equilibrium?

7. The thermal decomposition of ammonium chloride is a reversible reaction. Write a balanced symbol equation for this reaction and explain how it demonstrates dynamic equilibrium.

Answers

1. What is the difference between the two equations below?



In the first equation the arrow indicates that the reaction goes to completion that is 100% of the reactants are turned into products. The second equation is a reversible reaction, here the reactants can turn into products and the products can also react and reform the reactants.

2. What symbol is used to show a reversible reaction?

\rightleftharpoons (a double-headed arrow)

3. What is the name for the state reached in a reversible reaction when the rates of the forward and backward reactions are equal?

Dynamic equilibrium

- b. What is meant by dynamic equilibrium?

Dynamic equilibrium is the state in a reversible reaction where the rate of the forward reaction equals the rate of the backward reaction, resulting in no net change in the concentration of reactants and products.

4. True or False: At dynamic equilibrium, the concentrations of reactants and products are always equal.

False

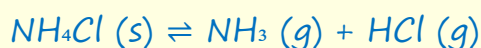
5. Describe what is meant by a reversible reaction.

A reversible reaction is a chemical reaction where the products can react to reform the original reactants. It proceeds in both the forward and backward directions.

6. In a closed system, how does the concentration of reactants and products change as a reversible reaction reaches equilibrium?

Initially, the concentration of reactants decreases, and the concentration of products increases. At equilibrium, the concentrations of both reactants and products remain constant.

7. The thermal decomposition of ammonium chloride is a reversible reaction. Write a balanced symbol equation for this reaction and explain how it demonstrates dynamic equilibrium.



When heated, solid ammonium chloride decomposes into ammonia gas and hydrogen chloride gas. Upon cooling, the ammonia and hydrogen chloride gases recombine to form solid ammonium chloride. At dynamic equilibrium, the rate of decomposition equals the rate of recombination, and the concentrations of all species remain constant within a closed system.