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METHODOLOGY OF USING PEDAGOGICAL TECHNOLOGIES IN TEACHING THE TOPIC OF CHEMICAL EQUILIBRIUM

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Annotation: This article provides information about chemical equilibrium and the factors affecting it. Methodological recommendations for its teaching are given.

Keywords: chemical equilibrium, reversible reactions, equilibrium constant, dynamic equilibrium, Le Chatelier’s principle, hydrolysis equilibrium, degree of dissociation, ionic product.

Introduction:

In most chemical reactions, substances taken for the reaction converting into completely different substances as a result of the reaction, i.e. reaction will go all the way. For example, when potassium chloride and berthollet's salt ($KClO_3$) are heated, the oxygen molecule is completely formed:

$$KClO_3 = 2KCl + 3O_2$$

This reaction is unidirectional and is an **irreversible process (reaction)** and goes all the way.

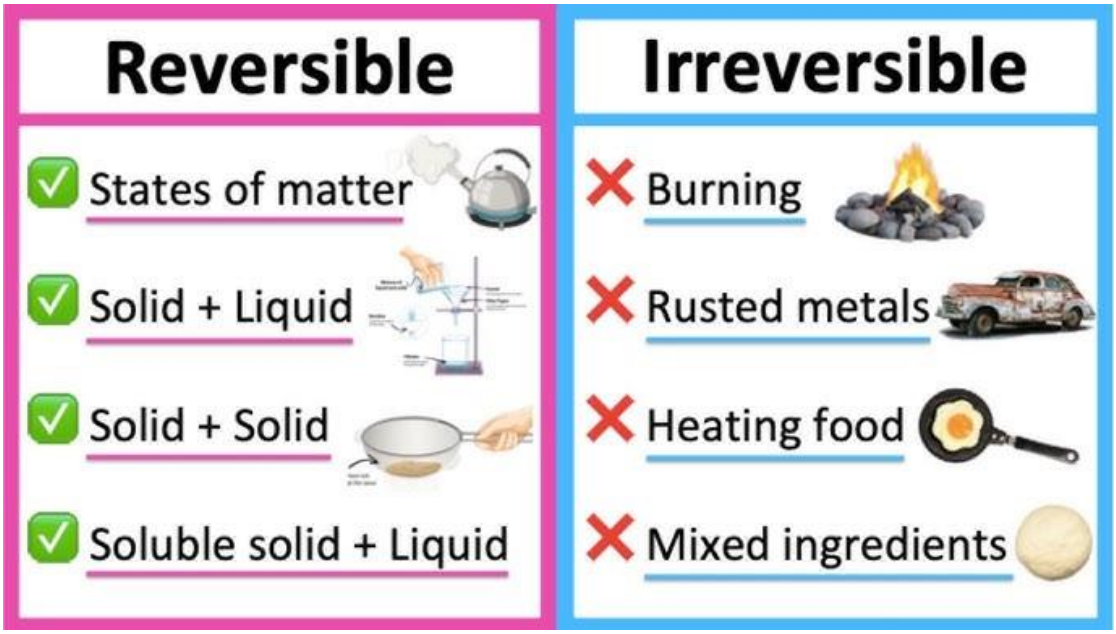
Reaction between hydrogen and iron oxide completely different. If hydrogen is deposited over a superheated iron filings the iron is reduced, and the oxygen contained in the iron carbide is hydrogen to form water:

$$Fe_3O_4 + 4H_2 = 3Fe + 4H_2O$$

On the other hand, to obtain iron fillings and hydrogen molecules by reacting iron powder with water vapor at the same temperature:

$$3Fe + 4H_2O = Fe_3O_4 + 4H_2$$

Processes that can go both ways under the same conditions are **reversible or bilateral** processes (reactions).

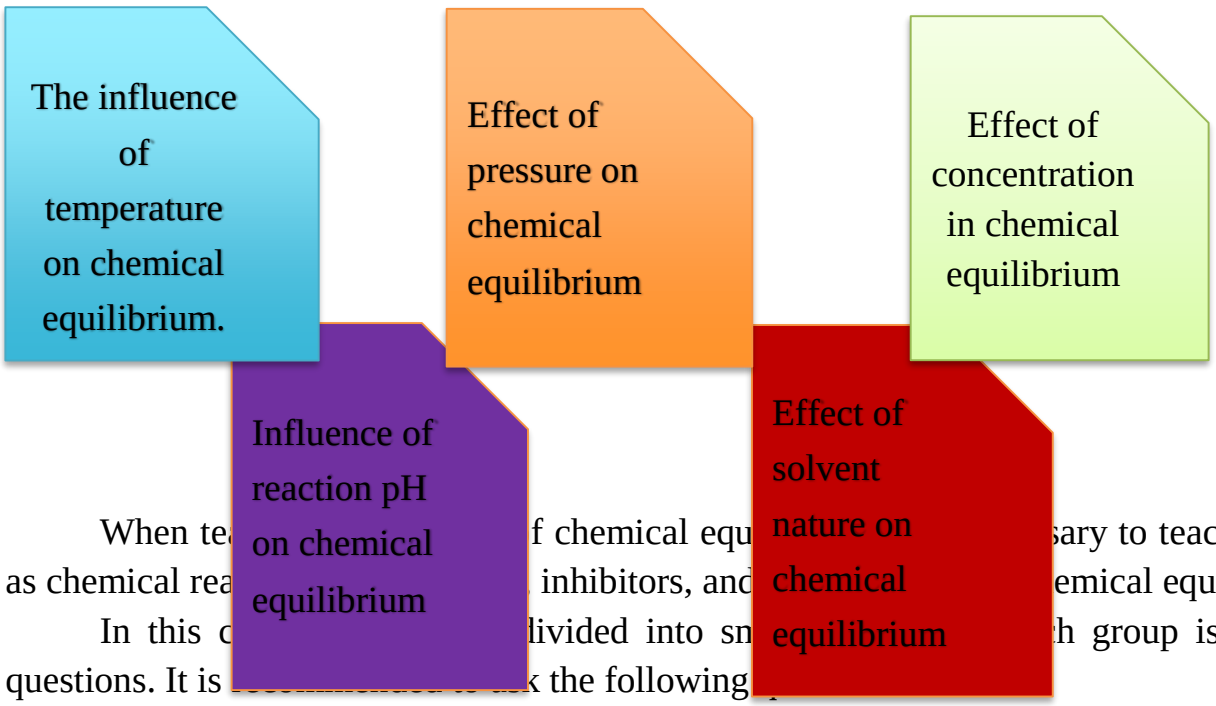


Chemical equilibrium state equilibrium concentration, i.e. at equilibrium:
$v_1 = v_2$ and the reaction rate equation: $K_1[A]^a[B]^b = K_2[C]^c[D]^d$
will take the form of. From:

$$K= K_1 / K_2=[C]^c[D]^d / [A]^a[B]^b$$

In the formula, K is the total equilibrium constant of the reaction. Consequently, the equilibrium constant is the result of the equilibrium state. Product of concentrations of substances equilibrium of initial substances is the product of the concentrations in the stateis a number with a constant value for.

Factors affecting chemical equilibrium Le Chatelier principle



When te f chemical equ sary to teach concepts such as chemical rea inhibitors, and emical equilibrium.

In this c ivided into sn h group is given a set of questions. It is k the following

1. What is the effect of increasing the concentration of a substance on the equilibrium?

2. What is the effect of increasing the temperature on the chemical equilibrium?

3. What is the effect of a catalyst on the chemical reaction?

Each small group must answer the questions and illustrate their answers with examples.

"Find the match" method. This method provides concepts and definitions on the topic of chemical equilibrium. Students must find and match the definition that matches the concept.

"Find the match"			
1	Homogeneous system	a	formation of products from starting materials
2	Heterogeneous system	b	substances that accelerate chemical reactions and are not consumed themselves
3	Catalyst	c	reactions that occur in the same phase
4	Correct reaction	d	substances that slow down chemical reactions
5	Reverse reaction	e	recycling of products back into starting materials
6	inhibitors	f	reactions that occur in different phases

In conclusion, chemical equilibrium is a dynamic state resulting from the equalization of the rates of direct and reverse processes in reversible reactions. Understanding this situation serves as a foundation not only for theoretical chemistry but also for managing technological processes. Knowing the laws of equilibrium allows for predicting what changes external influences (pressure, temperature, concentration) will bring to the system.

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