

NATURAL MINERALS OF ALKALI METALS, PHYSICAL AND CHEMICAL PROPERTIES

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Annotation: This article studies the natural minerals of the elements belonging to the alkali metal group, as well as their physical and chemical properties. Alkali metals are characterized by their high reactivity, softness and low density. The article analyzes minerals containing alkali metals such as lithium, sodium, potassium, their industrial importance, as well as chemical reactions and physical parameters. This study is aimed at developing a deeper understanding of alkali metals and developing their effective use

Keywords

- Alkali metals
- Natural minerals
- Lithium
- Sodium
- Potassium
- Physical properties
- Chemical reactivity
- Hydrolysis

Introduction: Alkali metals are elements of group I of the periodic table of chemical elements, located after hydrogen and characterized by high reactivity. Their natural minerals and properties play an important role in the chemical, industrial, and energy sectors. This article provides general information about the natural minerals of alkali metals, as well as their physical and chemical properties.

Natural minerals of alkali metals

Alkali metals include lithium (Li), sodium (Na), potassium (K), rubidium (Rb), cesium (Cs), and francium (Fr). Their natural minerals include:

- Lithium minerals: Spodumene ($\text{LiAl}(\text{SiO}_3)_2$), lepidolite ($\text{K}(\text{Li},\text{Al})_3(\text{Si},\text{Al})_4\text{O}_{10}(\text{F},\text{OH})_2$), amblygonite.

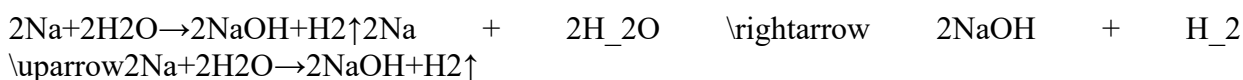
- Sodium minerals: Sodium chloride (NaCl, salt), sodium sulfate (Na₂SO₄), sodium carbonate (Na₂CO₃).
- Potassium minerals: Kalitalkallite (KAlSi₃O₈), sylvinite (KCl), carnallite (KMgCl₃·6H₂O).
- Rubidium and Cesium minerals: Very rare, sometimes found in polluxite and lepidolite.
- Francium: Very rare and not found in natural form.

Physical properties of alkali metals

- Metallic appearance: Alkali metals have a shiny silvery metallic appearance.
- Lightness: These metals are among the lightest metals, with low densities (e.g., lithium has a density of 0.53 g/cm³).
- Softness: Alkali metals are very soft, and can be cut with a knife.
- Sharp temperatures: Their melting and boiling points are low, indicating that their atomic bonds are relatively weak.
- Electrical and thermal conductivity: Highly conductive of electricity and heat.

Chemical Properties of Alkali Metals

- Reactivity: Alkali metals are very reactive and react rapidly with oxygen and water.
- Hydrogenation: They release hydrogen gas when reacted with water and form hydroxides such as:



- Reaction with acids: They react rapidly with acids and form the corresponding alkaline salts.
- Chemical activity: Reactivity decreases from top to bottom in the table (from lithium to francium).
- Bonding properties: They usually have a +1 valence state, and are widely used as bonding metals.

Summary Alkali metals are characterized by their high reactivity, lightness, and softness. Their natural minerals are mainly found in nature and are important raw materials for industry. Their physical and chemical properties allow them to be widely used in the chemical industry, especially in the preparation of hydroxide and alkaline solutions. The study of these metals and their effective use is important in the development of new technologies in the future.

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