

Specification of Celestine Ore (Celestite - SrSO_4)

Celestine ore, also known as celestite, is a naturally occurring strontium sulfate mineral (SrSO_4). It is the primary source of strontium, which is used in various industrial applications, including pyrotechnics, glass manufacturing, and electronics. Below are its typical specifications:

1. Chemical Composition

Component	Formula	Typical Percentage (%)
Strontium Sulfate	SrSO_4	85 – 98%
Barium Sulfate	BaSO_4	0 – 5%
Calcium Sulfate	CaSO_4	0 – 5%
Silica	SiO_2	0 – 3%
Iron Oxide	Fe_2O_3	0 – 1%
Aluminum Oxide	Al_2O_3	0 – 1%
Moisture	H_2O	0 – 2%

2. Physical Properties

Property	Description
Color	Colorless, pale blue, white, gray, or light yellow
Crystal System	Orthorhombic
Hardness (Mohs scale)	3 – 3.5
Specific Gravity	3.9 – 4.0
Luster	Vitreous to pearly
Cleavage	Perfect in one direction
Fracture	Uneven to conchoidal

3. Industrial Applications

- **Strontium Compounds Production:** Used in the manufacturing of strontium carbonate (SrCO_3) and other strontium chemicals.
- **Pyrotechnics:** Provides the red color in fireworks and signal flares.
- **Glass & Ceramics:** Enhances X-ray-absorbing glass and color television tube glass.
- **Metallurgy:** Used as a fluxing agent in aluminum and zinc refining.
- **Oil & Gas Industry:** Acts as a weighting agent in drilling fluids.

4. Market Grades of Celestine Ore

Celestine ore is generally available in the following grades:

1. **High-Grade Celestine** ($\text{SrSO}_4 > 90\%$) – Suitable for chemical and high-purity applications.
2. **Medium-Grade Celestine** (SrSO_4 80-90%) – Used in industrial applications like pyrotechnics and ceramics.
3. **Low-Grade Celestine** ($\text{SrSO}_4 < 80\%$) – Used in general industrial processes.

5. Forms of Celestine Ore in Trade

- **Lumps** (Natural raw ore)
 - **Powder** (Milled form for industrial use)
 - **Concentrates** (Beneficiated material with higher SrSO_4 content)
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6. Global Sources & Deposits

Celestine is mainly mined in:

- **Iran**
 - **Turkey**
 - **China**
 - **Mexico**
 - **Spain**
 - **Pakistan**
 - **United States**
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