**Specification of Celestine Ore (Celestite - SrSO₄)**

Celestine ore, also known as celestite, is a naturally occurring strontium sulfate mineral (SrSO₄). 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 | SrSO₄ | 85 – 98% |
| Barium Sulfate | BaSO₄ | 0 – 5% |
| Calcium Sulfate | CaSO₄ | 0 – 5% |
| Silica | SiO₂ | 0 – 3% |
| Iron Oxide | Fe₂O₃ | 0 – 1% |
| Aluminum Oxide | Al₂O₃ | 0 – 1% |
| Moisture | H₂O | 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 (SrCO₃) 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** (SrSO₄ > 90%) – Suitable for chemical and high-purity applications.
2. **Medium-Grade Celestine** (SrSO₄ 80-90%) – Used in industrial applications like pyrotechnics and ceramics.
3. **Low-Grade Celestine** (SrSO₄ < 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 SrSO₄ content)

**6. Global Sources & Deposits**

Celestine is mainly mined in:

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