



*Feldspar; the backbone of the ceramic and porcelain industry*



## Introduction

**Feldspar:** is by far the most abundant group of minerals in the earth's crust, forming about 60% of terrestrial rocks. Most deposits offer sodium feldspar as well as potassium feldspar and mixed feldspars. Feldspars are primarily used in industrial applications for their alumina and alkali content. The term feldspar encompasses a whole range of materials.

Most of the products we use on a daily basis are made with feldspar: glass for drinking, glass for protection, fiberglass for insulation, the floor tiles and shower basins in our bathrooms, and the tableware from which we eat. Feldspar is part of our daily life.



### Mineralogical Composition of Feldspar:

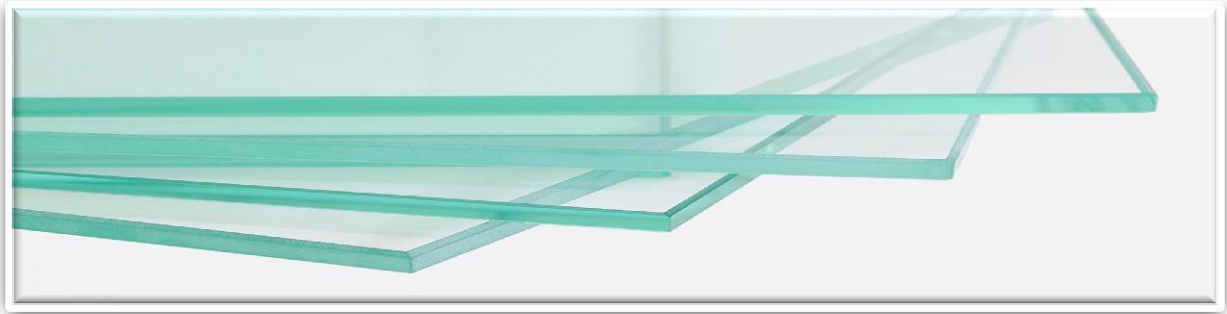
Feldspar minerals are essential components in igneous, metamorphic and sedimentary rocks, to such an extent that the classification of a number of rocks is based upon feldspar content. The mineralogical composition of most feldspars can be expressed in terms of the ternary system Orthoclase ( $\text{KAlSi}_3\text{O}_8$ ), Albite ( $\text{NaAlSi}_3\text{O}_8$ ) and Anorthite ( $\text{CaAl}_2\text{Si}_2\text{O}_8$ ).

### Chemical Composition of Feldspar:

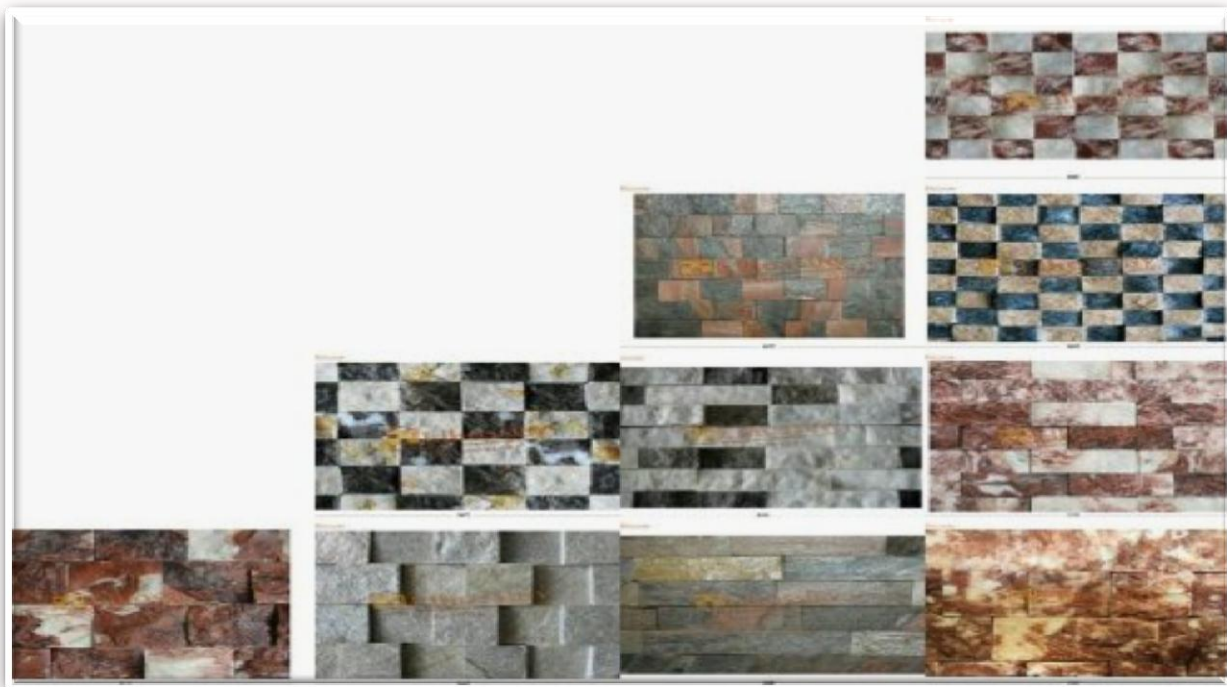
Chemically, the feldspars are silicates of aluminum, containing sodium, potassium, iron, calcium, or barium or combinations of these elements.

### Uses of Feldspar:

**Glass Industry:** Feldspar is an important ingredient in the manufacture of glass and an important raw material as well, because it acts as a fluxing agent, reducing the melting temperature of quartz and helping to control the viscosity of glass. The alkali content in feldspar acts as flux, lowering the glass batch melting temperature and thus reducing production costs.



***Ceramics Industry:*** In the manufacture of ceramics, feldspar is the second most important ingredient after clay. Feldspar does not have a strict melting point, since it melts gradually over a range of temperatures. This greatly facilitates the melting of quartz and clays and, through appropriate mixing, allows modulations of this important step of ceramic making. Feldspars are used as fluxing agents to form a glassy phase at low temperatures and as a source of alkalis and alumina in glazes. They improve the strength, toughness, and durability of the ceramic body, and cement the crystalline phase of other ingredients, softening, melting and wetting other batch constituents.



**Fillers:** Feldspars also are used as fillers and extenders in applications such as paints, plastics and rubber. Beneficial properties of feldspars include good dispersability, high chemical inertness, stable pH, high resistance to abrasion, low viscosity at high filler loading, interesting refractive index and resistance to frosting. The products used in such applications are generally fine-milled grades.

**Enamel frits and glazes:** Feldspar assists the enamel composition, assuring the absence of defects and the neatness of the end product: e.g. enamel frits, ceramic glazes, ceramic tile glazes, sanitary ware, tableware, electrical porcelain and giftware.



## Feldspar in Jordan

### Introduction

In Jordan, feldspar deposits are found in alkali granite rocks; leucogranite, feldspar pegmatite and alkali-rich granite, which occur as medium and coarse grained, light colored igneous rocks such as aplites and alaskite respectively which have a granite composition but are characterized by low levels of mafic (iron-bearing) minerals.



### Geological Setting

Igneous rocks, which form part of the feldspar ore body, are part of the Yutum Granite Suite from the Aqaba complex. The age of these rocks range from approximately 630–600 Ma. The source of the feldspar is the granitoides of Abu Jadda granite and/or Imran Monzogranite units.



## Location and Reserves

Area	Location	Reserve (million ton)
Wadi Al Jayoshia	6 km south of Aqaba	115
Wadi Al-Mahlabah	5 km north east of Aqaba	0.4
Jabal Al-Gufran	18 km NE Aqaba along Aqaba-Ma'an Highway	0.6
Wadi Sader Mulgan	25km north of Aqaba and 8km to the west	22
Wadi Al Bayyara	50km north of Aqaba and 13km to the west	23
Wadi Sader Ash-Shuqayri	50km north of Aqaba and 10km to the west	9

## Chemical Properties

Area	SiO <sub>2</sub> %	CaO %	MgO %	Fe <sub>2</sub> O <sub>3</sub> %	Al <sub>2</sub> O <sub>3</sub> %	TiO <sub>2</sub> %	MnO %	Na <sub>2</sub> O %	K <sub>2</sub> O %
Wadi Al Jayoshia	71.46	1.05	0.35	1.02	13.98	0.88	0.02	5.53	4.29
Ain Al-Hasheem	70.37	1.29	0.52	2.21	14.95	0.37	0.37	2.02	6.27
Wadi Sader Mulgan	72.99	0.61	0.07	0.65	14.29		0.02	4.13	5.64
Wadi Al Bayyara				1.96				4.81	3.71
Wadi Sader Ash-Shuqayri				1.82	16.07	0.25		4.95	3.52

## Investment Opportunities

Feldspar ore deposit in the Wadi Sadr Mulghan and Wadi Sader Ash Shuqayri areas are more favorable for mining and exploitation for the following reasons:

1. Less in Ferro-magnesium minerals.
2. Higher alkali content.
3. Less dykes.
4. Easier exploitation.
5. More accessible.
6. Easy for mining.

*For that it can be used in the glass and ceramics industry.*

**Note: For More Information and inquiry can be contacted at the following address:**

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