Mica Group of Minerals

The **mica** group of sheet silicate (phyllosilicate) minerals having nearly perfect basal cleavage.

The most easily recognizable characteristic are the thin crystal layers. With many micas the sheets peel off in thin transparent layers due to mica's perfect cleavage.

The commercially important micas are muscovite and phlogopite.

Phlogopitic micas are important minerals in lamproites and lampropyres. Muscovite and biotites occur in green schist facies rocks, pegmatites and granites.

Biotite may be present in granulites as well as in lamprophyres and lamproites.

Physical Properties

Chemical formula: any of a group of hydrous potassium, aluminum silicate minerals.

Color(s): white, yellowish, green, gray, black

Streak: colorless
Luster: vitreous to pearly
Transparency: transparent, translucent, opaque
Crystal system: monoclinic
Specific Gravity: 2.8

Hardness (Mohs): 2.5 - 3 Cleavage: perfect Fracture: uneven Uses: As insulators in electronics , paint industries etc.

Classification

Chemically, micas can be given the general formula

X2Y4-6Z8O20(OH, F)4

where X is K, Na, or Ca or less commonly Ba, Rb, or Cs; Y is Al, Mg, or Fe or less commonly Mn, Cr, Ti, Li, etc.; Z is mainly Si or Al, but also may include Fe3+ or Ti.

Structurally, micas can be classed as dioctahedral (Y = 4) and trioctahedral (Y = 6).

If the X ion is K or Na, the mica is a *common mica*, whereas if the X ion is Ca, the mica is *brittle mica*.

di-octahedral mica, when two Al cations occupy the octahedral sites of Mica, like

Muscorite [K Al₂(Si₃Al)O₁₀(OH)₂] Paragonite [NaAl₂(Si₃Al)O₁₀(OH)₂] Pargarite [CaAl₂(Si₃Al₂)O₁₀(OH)₂].

tri-octahedral mica when three di-valent cations like (Mg, Fe_{2+}) occupy the octahedral sites of mica.

Biotite [(K, Na) (Mg, Fe, A)₃(Si₃Al)O₁₀(OH)₂] Zinnwaldite [K(Fe, Li, Al)₃Si₆₋₇Al₆₋₅(OH)₂] Clintonite [Ca(Mg, Fe)₃Si₂₋₅Al₅₋₅]

Di-octahedral			
	x	Y	Z
Muscovite	K2	Al	Si ₆ Al ₂
Paragonite Glauconite	Na ₂ (K,Na) _{1.2-2.0}	Al ₄ (Fe,Mg,Al) ₄	Si ₆ Al ₂ Si _{7 - 7.6} Al _{1.0 - 0.4}
Margarite	Ca ₂	Al4	Si ₄ Al ₄
	Tri-octa	hedral	
	X	Ŷ	Z
Phlogopite	K2	(Mg,Fe ²⁺) ₆	Si ₆ Al ₂
Biotite	K ₂	(Mg,Fe,Al) ₆	$Si_{6-5}Al_{2-3}$
Zinnwaldite	K ₂	(FC,LI,AI) ₆	S_{6-7}^{1}
Clintonite		$(Mg,Al)_6$	Si2.5Al5.5
	Muscovite Paragonite Glauconite Margarite Phlogopite Biotite Zinnwaldite Lepidolite Clintonite	Di-octa	$\begin{array}{c c c c c c c c c c c c c c c c c c c $

Uses

chemically inert, dielectric, elastic, flexible, hydrophilic, insulating, lightweight, platy, reflective, refractive, and range in opacity from transparent to opaque.

It is used in paints as a pigment extender and also helps to brighten the tone of colored pigments

In the electrical industry the same as thermal insulation, and electrical insulators in electronic equipment

Its shiny and glittery appearance makes it ultimate for toothpaste and cosmetics

The high thermal resistance allows it to be used as an insulator in various electronics

Mica is non toxic mineral. It is one of the important ingredient in makeup and various cosmetics. It gives a glowing effect with a natural finish. There are no side effects and suits for all types of skin.