

Ornamental Stones

Damayanthi Epa (FGA, PG Diploma in Gemmology)

Beauty, durability and rarity are the most important qualities of the gem stones. Beauty depends on the optical properties such as colour, special optical effects and transparency. Gems are divided into three categories according to the degree of transparency of light. They are transparent, translucent and opaque. Most of the ornamental stones are translucent or opaque. Their beauty depends on the colour. Different types of sculpture, statues and ornaments are made using these stones.

1. Jadeite & Nephrite

i. Jadeite

Chemical composition	-	$\text{NaAlSi}_2\text{O}_6$
Crystal System	-	Monoclinic
Crystal Structure	-	Polycrystalline material
Occurrence.	-	as a grainy aggregate in metamorphic rocks
Hardness	-	6 ½
Refractive index	-	1.652 -1.688 DR-0.020
Specific Gravity	-	3.30-3.38
Colours	-	green, mauve, white, red, orange, yellow, brown



“Jadeite” name derived from Jade. (The name Jade derived from the Spanish words ‘piedra de ijada’). Jadeite is very tough. Jade was seen as a protection of kidney diseases.

Imperial Jade	-	Jadeite from Myanmar
Yunan Jade	-	Chinese for Jadeite
Locality	-	Myanmar, Japan, California, U.S.A., Guatemala, Russia
Fashioning	-	Beads, cabochons and carvings

ii. Nephrite

Chemical composition	-	$\text{Ca}_2(\text{Mg, Fe})_5(\text{OH})_2(\text{Si}_4\text{O}_{11})_2$
Crystal System	-	Monoclinic
Hardness	-	6-6 ½
R.I.	-	1.600-1.627DR-0.027
Specific Gravity	-	2.90-3.03
Colour	-	white, dark green, orange, blue, grey, black



The name ‘Nephrite’ derived from the Greek word for kidney. It is a fibrous aggregate. Nephrite is tougher than Jadeite.

Fashioning	-	cabochons, beads, carvings.
Locality	-	Australia, Brazil, China, Canada, Zimbabwe, Russia, Taiwan, Alaska

Apart from those, there are different varieties in the market in these names. As examples; Indian Jade is a (misleading) name for aventurine glass, Russian Jade is the trade name for green nephrite from Lake Baikal and Wyoming Jade is the trade name for nephrite from Wyoming.

2. Malachite

Chemical composition	- Hydrated copper carbonate $\text{Cu}_2(\text{CO})_3(\text{OH})_2$
Crystal System	- Monoclinic
Habit	- Botryoidal
Fracture	- uneven
Hardness	- 3 ½ -4
R.I.	- 1.655-1.909; DR- 0.254
Transparency	- translucent to opaque



The name malachite means green colour. In Greek malacha means green and soft. When cut it shows light & dark concentric rings. Colouring agent is copper. Rough stones show mat lustre. When polished, it shows silky lustre. Malachite is sensitive to heat, acid and hot water. Because of low hardness malachite is easily scratched. It is commonly confused with opaque green stones. Ancient Egyptians used malachite powder as eye shadow.

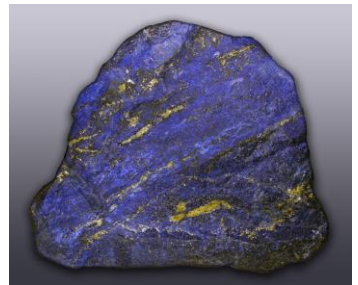
Fashioning is done as; beads, cabochons, carvings and also used as plates, boxes, ash trays and sculpture. When Inter-grown with azurite, it is called 'Azure malachite' and when Inter-grown with turquoise and chrysocolla it is called 'Eilat stone'.

These are mostly found in Urals and other areas are Sheba in Zaire, Australia, Chile, Namibia and Zimbabwe.

3. Lapis Lazuli

Chemical Composition	- $(\text{NaCa})_8[(\text{SiO}_4\text{S,Cl})_2(\text{AlSi})_4]_6$ Sodium Calcium Aluminium Silicate
Colour	- Blue, violet, greenish blue
Hardness	- 5-6
R.I.	- 1.50
Specific Gravity	- 2.50
Transparency	- opaque
Structure	- dense aggregate, granular

Lapis Lazuli means blue stone (Arabic) it is a rock with several minerals. (Lazurite-25%, augite, calcite, diopside, enstatite, mica, hauynite, hornblend, nosean, sodalite and pyrite) Colouring agent is sulfur. Well distributed pyrite show genuiness and beauty. The presence of too much calcite diminishes the value. Lapis Lazuli is porous and sensitive to temperature, hot water, acid and alkaline.



Lapis is always confusing with azurite, lazurite, hawlite and sodalite in identification.

Imitations	- Synthetic grainy spinel, dyed jasper (Swiss lapis)
Fashioning	- carvings, beads, cabochons.

4. Rhodochrosite

Chemical composition	- MnCO_3
Crystal system	- Trifocal (rhombohedra)
Structure	- aggregate
Colour	- Rose, red (striped)
Hardness	- 4
R.I.	- 1.600 -1.820; DR- 0 208
Specific gravity	- 3.45-3.70
Dispersion	- 0.015
Transparency	- Transparent to opaque



Rhodochrosite means rose colour (In Greek) and also called Mangespar and raspberryspar. Transparent crystals are very rare. Aggregates have dark and light stripes with zig-zag bands. Raspberry and pink are most common colours. These are often confusing with fire opal, rhodonite, tugtupite and bastamite.

The most important deposits are in Argentina. Others are Chile, Mexico, Pero, South Africa, and U.S.A.

5. Rhodonite

Chemical composition	- $(\text{Mn,Fe,Mg,Ca})\text{SiO}_3$
Crystal system	- Triclinic (compact aggregate)
Colour	- Dark red , red with dendritic inclusions
Hardness	- 5 ½ -6 ½
R.I.	- 1.726-1.752; DR -0.014
Specific Gravity	- 3.40-3.74
Lustre	- vitreous



Rhodonite means rose colour (Greek). It has black dendritic inclusions of Manganese oxide. Transparent stones are very rare. In the field it is often confusing with rhodochrosite and thulite. Brownish or yellowish rhodonite variety is called Fowlerite.

Fashioning	- carvings, beads, cabochons.
Locality	- Australia, Finland, Japan, Canada, Madagascar, Mexico, Russia

6. Turquoise

Chemical composition	- $\text{CuAl}_6(\text{PO}_4)_4(\text{OH})_8 \cdot 4\text{H}_2\text{O}$ Hydrous copper aluminium phosphate with some iron
Crystal System	- Triclinic
Habit	- nodular botryoidal habit
Colour	- Deep sky blue, blue, bluish green, apple green
Hardness	- 5 ½ -6
R.I.	- 1.610-1.650 DR - 0.040
Specific Gravity	- 2.31 -2.84
Lustre	- waxy

The name turquoise means 'Turkish stone'. These stones brought to Europe via Turkey. Pure blue stones are very rare. It is interspersed with brown, dark grey and black veins. Turquoise can be intergrown with malachite and chrysocolla. Most of the stones from U.S.A. contain iron and impart a greenish colour. Turquoise occurs as nodules or grape-like masses. Turquoise is sensitive to light, oils, perspiration, cosmetics and detergents. When heated the colour changes to dull green at 250°C.



Usually turquoise is confused with amazonite, hemimorphite, lazurite, serpentine, smithsonite.

Imitations - Neolite, Neo turquoise, Viennese turquoise

Fashioning - beads, cabochons, carvings.

Locality - Afghanistan, Argentina, Australia, Brazil, Chile, Israel, Mexico, Tanzania, U.S.A

7. Serpentine

Chemical composition	- $\text{H}_4\text{Mg}_3\text{Si}_2\text{O}_9$
Crystal system	- Monoclinic
Colour	- Green, yellow, brown
Hardness	- 2 ½ -5 ½
R.I.	- 1.560-1.571 DR -0.008 -0.014
Specific Gravity	- 2.44 -2.62
Lustre	- greasy to silk



Serpentine means snake in Latin. There are two categories of serpentine called leafy serpentine and fibrous serpentine. Precious serpentine sold as jade.

Usually Serpentine is confusing with jade, onyx and marble.

Fashioning	- Carvings, beads, cabochons
Bastatite	- Silky shiny serpentine called
Bowenite	- Apple green serpentine
Connimara	- Serpentine inter-grown with marble
Verdantique	- serpentine inter-grown calcite and dolomite veins.
Williamsite	- oil green serpentine.
Fashioning	- carvings, beads, cabochons
Locality	- Afganistan, China, New Zealand, U.S.A

8. Sodalite

Chemical composition	- $\text{Na}_8\text{Al}_6\text{Si}_6\text{O}_{24}\text{Cl}_2$ (Chloric sodium aluminium silicate)
Crystal system	- cubic
Structure	- coarsely crystalline material
Colour	- blue, grey, violet, pink (usually with white veins and patches)
Hardness	- 5 -6
R.I.	- 1.48
Specific Gravity	- 2.15 - 2.35
Lustre	- vitreous



Sodalite means sodium contents. Sodalite dispersed with white veins of calcite.

Fashioning	- Cabochons, beads, carvings
Hackmanite	- Pink sodalite variety first discovered in 1991 in Quebec

Sodalite is commonly confusing with azurite, lazulite, dumotierite.

Locality	- Brazil, Greenland, India, Canada, Namibia, Russia.
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