TYPES OF METAMORPHIC ROCKS

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PHYLLITE

Phyllites are fine grained micaceous rocks with highly developed foliations. They usually show satiny luster.

Texture and Structure: - It is intermediate between slaty cleavages and schistocity. It is fine grained but the constituents are microscopically identifiable. All the minerals are highly oriented.

Mineral Composition: - Phyllites contain fined grained Muscovite, Quartz, Chlorite and the accessories are Magnetite, Hematite, Ilmenite, etc.

Origin: - Phyllites are formed by low grade metamorphism of shales and clays.

AMPHIBOLITES

Amphibolites are amphibole rich rocks with essential plagioclase.

Texture and Structure: - May be foliated or non-foliate, or poorly foliated or schistose rock. The hornblende needles are parallel or super parallel but never radial. Hornblende in uniformly distributed or concentrated in layers or lenses.

Mineral Composition: - Hornblende, Plagioclase and Quartz with or without Garnet, Botite Augite, Epidote etc.

Origin: - 1. Intermediate to high grade metamorphism of intermediate to mafic rocks or marls, Calcareous tuffs, etc.

2. Metasomatism of carbonate rocks.

SCHIST

Schists are rocks which have schistose structure. In these rocks flaky, lamellar, tabular, rodlike and highly cleavable minerals are present. Due to them continuous folts of flakes or rodlike minerals are present which help to split the rock easily along them.

Mineral Composition: - Schist have characteristical minerals like Micas, Chlorites, Tremolites, Actinolites, etc. Besides these they may have Quartz, Feldspar, Garnets, Hornblende, etc. Several types of schist are known according to their mineral composition such as:-

Name	Composition
Muscovite Schist	Muscovite, Quartz, Felspar.
Biotite Schist	Biotite, Quartz, Felspar.
Muscovite Biotite schist	
Kyanite Schist, Staurolite Schist.	

Origin: - They are formed by the regional metamorphism of pelitic sediments

GNEISS

They are coarse grained gneissic rocks having gneissose structure, which is generally visible in bending.

Texture and Structure: - They are alternate bands of different composition and texture. Gneiss splits along planes loss readily than schists, but loaves a rougher surface. The grain size may be uniform on variable in different varieties. The minerals orient in well-defined planes. The mafic minerals may be clustered together.

Mineral Composition: - Quartz, Felspars, Micas and other accessories like Apatite, Zircon, Sphene, Garnet, Tourmaline, Kyanite, etc.

Origin: - It is the product of regional deepseated on high grade metamorphism of Granites, Granodiorites, etc.

GRANULITE

Granoblastic metamorphic rocks having equidimensional minerals are known as Granulites.

Texture and Structure: - Granulites are coarsely xonomorphic granoblastic. They may have banded parallel and strosky structure.It is between gneissose and schistose structure.

Mineral Composition: - Potash Felspar is predominant, quartz is subordinate to it. The commonly occurring minerals are Garnet, Kyanite, Sillimanite, Hornblende, Diopside, Hypersthene, Graphite etc.

Origin: - Granulites are formed under deepseated regional metamorphism

of Granites, Syenites, Rholites, Sandstones, etc.

RHYOLITE

Rhyolite is extrusive and hypabasal, holocrystalline to hypocrystalline with affinitic matrix.

Texture and Structure: - many rhyolites are porphyritic but a variety of matrix may be present. The matrix may be holocrystalline to holohyaline. These may show flow, banded or trachytic structure.

Mineral Composition: - Similar to granite in composition. Alkali feldspar exceeds plagioclase. Quartz occurs both in matrix and as phenocrysts.

Feldspars:-Alkali feldspars is generally sanidine but in hypabasal type. Orthoclase, Microperthite and anorthoclase may be present. Plageoclase if present is a phenocrysts and rarely in matrix. Normally it in oligoclase.

Mafics – Brown or green Biotite as Phenocrysts

. Amphibole is rare.Diopside, Angite or Hypersthene in present as Phenocrysts rarely.

Accessory - Sphene, Zircon, Apatite, Garnet.

Occurrence ;-Rhyolite occurs as flows and other volcanic types and in hypabasal like sills and dykes

TRACHYTE

Trachyte is holocrystalline, rarely vitreous with affinitic matrix.

Texture – Porphyritic with holocrystalline matrix.the lath shaped feldspars are arranged in a parallel fashion around the phenocrysts showing flow structute.

Mineral Composition: -

Potash feldspars – 45 to 80%

Sodic Plageoclase – 25 to 5%

Mafics (Biotite, Amphibole, Pyroxene) 30 to 10%

Potash Feldspar is usually sanidine, less commonly is soda orthoclase.

Plageoclase is usually oligoclase. Albite and andeene are rare.

Mafics – Biotite, brown to deep brown Hornblende occurs as Phenocrysts. Pyroxene is Diopside, Augite.

Accessories – Zircon, Apatite, Sphene, Ilmenite.

Occurrence – Occurs as volcanic rock or as minor hypabasal intrussives.

MARBLE

Marble is recrystallized equivalent of $CaCO_3$ and $MgCO_3$ rock from which all traces of clastic and organic structures are effaced.

Texture & Structure – It is fine or coarse grained equigranular, granoblastic or mosaic in texture.

Mineral Composition - Most Marbles are chiefly Calcite, but some may be dolomitic in composition. Still others may be calcite with dolomite in composition.

Origin – They are formed either by contact metamorphism or Regional metamorphism of limestone or Dolomites. Contacts types may have some metasomatic additions.

Type – They vary in colour from pure white to various shades of grey, green, pink, yellow to dark colours.

QUARTZITE

Quarzites are metamorphic rocks consisting chiefly of quartz.

Texture and Structure – Most Quartzite have equigranular granoblastic texture with the grains slightly interlocking.

Mineral Composition – Quartz is 60 to 95 % in quartzites.But minor minerals are numerous. They may be mica, Felspars, Garnets etc.

Types – Quartzite's are recognized according to the most important mineral accompanying quartz, for example, micaceous quartzites.

Origin – Quartzites are formed due to contact or regional metamorphism of various types of sandstone.

SLATE

Slates are fine grained to affinitic metamorphic rocks with highly developed foliation, i.e. slaty cleavage.

Mineral Composition - The mineral are not identifiable megascopically.The microscopically identifiable minerals are quartz, Biotite, Magnetite, Calcite, Dolomite etc.

Texture – The rock has slaty cleavages which enable it to be split along closely placed parallel and relatively smooth plane surfaces. These cleavages are at an angle to the original bedding planes. The gains are fine to crypto – crystalline with a high degree of parallel orientation of the minerals.

Origin – Slates are formed by the low grade regional metamorphism of clays and shales.