TYPES OF IGNEOUS ROCKS

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GRANITES

Granite is plutonic and hypabassal, holocrystalline, phaneric rock.

Texture – Granites are anhedral even grained, fine to coarse grained granular. Mafic minerals are anhedral to subhedral.

Granites are not uncommonly porphyrite with phenocrysts of orthoclase and microcline. Graphic granites have intergrowth of quartz and feldspars.

Mineral Composition

Quartz -10 to 40%, Potash Felspar -30 to 60%

Sodic Felspar -0 to 35 % Mafic Minerals -35 to 10%

Quartz – Normally interstitial, Phenocrysts are found only in porphyrites, also occurs as graphic intergrowth.

Felspar – Potash feldspar, mostly orthoclase, Anorthoclase and Microcline with Perthite. Soda felspars generally Albite and Oligoclase.

Mafic Minerals – Biotite is the most common mafic mineral.

Muscovite occurs with Biotite. Amphibole is green and Brownish. Hornblende, Diopside and Augite are uncommon but occur in Calc - Alkali rich granites. Hypersthene is rare.

SYENITE

Syenite is Intrusive polycrystalline and phaneritic igneous rock.

Texture – It is subhedral granular in texture. Grain size varies from coarse to fine grain. Porphyritic syenites are uncommon.

Mineral Composition

Potash Felspar - 30 - 80%

Soda Felspar - 5 - 25%

Mafic (Amphiboles, Pyroxenes and Biotites) – 40 to 10.

Plagioclase may be absent or accessory. When Plagioclase exceeds alkali feldspar, the rock is monazite.

Common potash Felspar are orthoclase microcline. In porphyritic, varities Sanidine from the phorphyries. Sodic felspar is commonly oligoclase, mafic mineral includes brown biotite, green hornblende, augite. Diopside less common.

Accessories – Quartz 5-10%, Zircon, Apatite, Sphene, Magnetite, Ilmenite.

Occurrence –It is relatively uncommon rock, it occurs as irregular plutons, dykes and sills.

DIORITE

Diorite is intrusive holocrystalline, phaneric rock.

Texture –It is equigranular and porphyritic. It is anhedral to subhedral granular.

Mineral Composition – Plagioclase (Oligoclase or Andacene) 55 to 7%Mafic hornblende orbiotite) - 40 to 25%.

The plagioclase is normally formed calcic oligoclase to calcite Andecene and

commonly shows normal type of twinning. Mafic minerals are hornblende but biotite, generally green, occurs with hornblende. Pyroxene is rare.

Accessories – Accessory minerals are Quartz, Magnetite, Apatite, Sphene, Zircon, Olivine etc.

Occurrence –Bodies of Diorites occur in large intrusive such as complex Batholiths.

GABBRO

Gabbro is an intrusive, plutonic, holocrystalline and phaneric rock.

Texture – Coarse to medium grained, subhedral grained. Porphyritic is rare but banded and gneissose structure textures are common, shown corona structure i.e. reaction timarerend is common.

Mineral Composition –

Mafics (Augite, Hypersthene, Olivine) – 25 to 50 % Plagioclase, (labradorite to Byotonite) – 70 to 45%.

Plagioclase is generally labradorite or Byotonite but Anorthite is uncommon.

Pyroxene of the common gabbro is augite or diopside, hornblende, occur as secondary minerals, It is rarely primary.

Accessories – Quartz, Biotite, Garnet, Sphene and Feldspathoids.

Types of Gabbro	Mineral Composition
Gabbro	Augite, Calcic, Plagioclase.
Olivine	Augite, Calcic, Plagioclase. Olivine.
Treotolite	Calcic, Plagioclase and Olivine.
Norite	Calcic, Plagioclase, Hypersthene.
Anorthosite	Calcic, Plagioclase.

Occurrence Gabbro occur in many ways

(1) Marginal phases of Batholiths.
(2) Individed Plutons.
(3) Layered pendditic lapolith.

This is Gabbro where only Plagioclase Feldspar occurs.

Pyroxene is rare and where occur in violate finted.

Texture – (1) A large pluton of Precambrian associated with pyroxene granite. (2) An segregation of strictly limited dimensions in gabbro masses.

BASALT

Basalt includes all the basic lavas. They are volcano but rarely hypabassal varieties found.

Texture – Basalt show a great variety of texture range from vitreous to holocrystalline with affinitic matrix.Basalts are porphyrite to phenocrysts of plagioclase olivine and augite etc.

Mineral Composition –

Plagioclase Felspar -40 to 60%.

Mafics (Augite,Hypersthene,Olivine,) 55 to 35 %.

Plagioclase are labradorite, Byotonite, Anorthite.

Phenocrysts are Biotonite or Anorthite but ground mass is

Labradorite. The phenocrysts show zohering but grained mass has feldspar lathens.

Mafics – include pyroxenes, olivine and hornblende with biotite.

Pyroxenes – Augite occurs as phenocrysts with octagonal cross section showing twinning and hour glass structure.

Hypersthene is rare in basalts and takes the place of olivine.

Olivine – These occur in great number of basalts. They are generally

phenocrysts with well-shaped crystals more or less rounded. Besides this brown hornblende, brown mica, crystals of magnetite, Ilmenite and apatite occur.

Occurrence –Basalt occur as lava flow.

OLIVINE BASALT

Olivine basalt is variety of basalt in which porphyritic augite is conspicuously absent.

Mineral Composition – Olivine most essential plagioclase Labradorite to Anorthite, Nepheline or leucite.

It shows varied textures as shown by basalts i.e. from vitreous to holocrystalline. Tertiary basalts are olivine basalts.