Quadrant II – Transcript and Related Materials

Programme	**: Bachelor of Science (Third Year)**
Subject	**: Geology**
Paper Code	**: GEC 107**
Paper Title	**: Igneous Petrology**
Unit	**: I**
Module Name	**: Textures in Igneous Rocks - II**
Module No	**: 17**
Name of the Presenter	**: Ms. Yogita Karkhanis**

Notes:

Mutual Relationship of the Crystals:

- Textures dependent on the mutual relation may be classified as equigranular, inequigranular, intergrowth, reaction and directive.

Equigranular textures:

- are those in which the constituent minerals are all of approximately same size.
- When most of the crystals are anhedral, the texture is further said to be allotriomorphic;
- When the crystals are subhedral, the texture is called hypidiomorphic.
- The term panidiomorphic is used for textures in which the majority of the crystals are euhedral.

Inequigranular textures:

- When the differences of the size in the constituent minerals of an igneous rock become so pronounced that, megascopically or microscopically, they control the aspect of rock, an inequigranular texture is produced.
- Two very important textures fall within this group; the Porphyritic and the Poikilitic.

Porphyritic:

- in this texture, the large crystals or phenocryst, are enclosed in a ground mass of finer crystals. Porphyritic texture is confined largely to volcanic and hypabyssal rocks.
    - Glomeroporphyritic: a texture wherein group of phenocryst of the different mineral species is surrounded by finer grained groundmass.
    - Orthophyric: if the group of phenocrysts is of same mineral species.

Poikilitic:

- texture is the converse of porphyritic. The smaller crystals are enclosed among larger ones without common orientation.
    - **Ophitic**: it is a special case of poikilitic texture in which plates of augite enclose numerous thin laths of plagioclase.
    - It is a characteristically found in dolerite. If the plagioclase laths are partially enclosed – called sub-ophitic.

Cumulative:

- early formed minerals in magma chamber settle under the influence of gravity and some of them arrange themselves parallel to each other or they suggest settlement under gravity.
- The minerals that settle down are called as **cumulate minerals** and the minerals that fill the interstices between these cumulate minerals are described as intercumulate minerals or **intercumulus**.

Intergrowth textures:

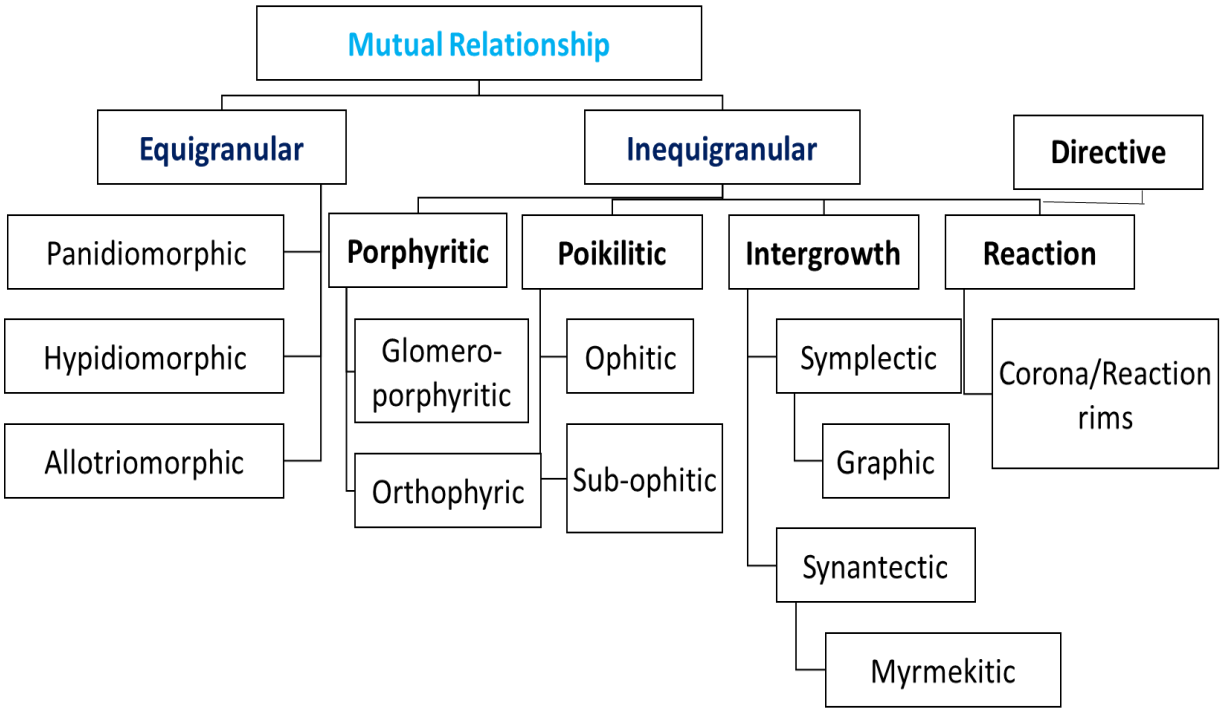
- are produced due to the simultaneous crystallization or reaction of two minerals.
- Symplectic (intergrowth formed due to simultaneous crystallization)
    - **Graphic**: it is a type of symplectic intergrowth. When quartz and alkali feldspar (orthoclase) are intergrown
    - Small scale graphic texture is called micrographic or **granophyric** texture.
    - When potash-rich feldspar contains strings, patches or lenticles of sodic plagioclase, the intergrowth is called **perthite.** If the reverse relationship exists, i.e. plagioclase contains potash felspar, the term **antiperthite** is used.
- Synantectic (intergrowth formed due to reaction between the minerals).
    - **Myrmekitic**: it is a type of synantectic intergrowth. It is an intergrowth between quartz and plagioclase wherein the quartz occurs as blebs, drops and in vermicular shapes within the feldspar.

Reaction textures:

- Reaction textures: these are produced when reaction takes place between early-formed minerals and the magma by which they are surrounded.
    - Corona and kelyphitic rims: a zone of reaction products surrounding a mineral is called a reaction rim. Reaction rims may be further classified as coronas when produced by primary magmatic reaction, and as Kelyphitic borders/rims when secondary.
    - Corona structures often show a nucleus of an early formed mineral such as olivine, surrounded by one or more zones of reaction minerals e.g. orthopyroxene, plagioclase etc.

Directive textures:

- Directive textures: are produced by flow in magmas during their crystallization. Early formed crystals tend to orient themselves in the direction of flow of magmas.
    - Trachytic texture: feldspar crystals show parallel to sub-parallel alignment in trachytes
    - Pilotaxitic texture: plagioclase is seen in basalts
    - Hyalopilitic texture: the fine microlites of feldspar are seen dispersed in a glassy base


Mutual Relationship
Equigranular
Inequigranular
Directive
Panidiomorphic
Hypidiomorphic
Allotriomorphic
Porphyritic
Poikilitic
Intergrowth
Reaction
Glomero-porphyritic
Orthophyric
Ophitic
Sub-ophitic
Symplectic
Graphic
Synantectic
Myrmekitic
Corona/Reaction rims