Quadrant II – Transcript and Related Materials (Notes)

Programme : **Bachelor of Science (First Year)**

Subject : **Geology**

Paper Code : **GEC 102**

Paper Title : **Introduction to Petrology**

Unit : **1**

Module Name : **Textures (Inequigranular (Porphyritic) Intergrowth (Graphic, Perthite), Directive(Trachytic))**

Name of the Presenter : **Kimberly Fiona Afonso**

Notes:

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: ***Porphyritic and 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.
- Two stages of cooling, i.e. slow cooling to grow a few large crystals, followed by rapid cooling to grow many smaller crystals could result in a ***porphyritic texture***, a texture with two or more distinct sizes of grains.
- E.g. Porphyritic texture occurs when magma crystallizes below a volcano but is erupted before completing crystallization thus forcing the remaining lava to crystallize more rapidly with much smaller crystals.

Poikilitic:

- Texture is the opposite of porphyritic. The smaller crystals are enclosed among larger ones without common orientation.
    - ***Ophitic***: it is a special case of poikilitic texture in which grains 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.***
- In **Igneous rocks poikilitic texture** is widely used to determine order of crystallization; if one mineral is enclosed by another then the enclosed grain must have been the first to crystallize.
- This texture is best seen under thin sections: microscope.

Intergrowth textures:

- Are produced due to the simultaneous crystallization or reaction of two minerals.
    - **Graphic**: it is a type of intergrowth. When quartz and alkali feldspar (orthoclase) are intergrown.
    - It is called '**graphic**' because the exsolved minerals form lines and shapes which are reminiscent of writing. This texture is most commonly observed in pegmatites.
    - Small scale graphic texture is called micrographic or **granophyric** texture.
- Symplectic (intergrowth formed due to simultaneous crystallization) e.g. Graphic texture or perthites.
- 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.

Perthites

- **Perthite** is used to describe an intergrowth of two Feldspars.
- When K-rich feldspar contains strings, patches or lenticles of Na plagioclase, the intergrowth is called **Perthite.**

- It is produced when a host grain of K-rich alkali feldspar includes exsolved lamellae or irregular intergrowths of Na-rich feldspar (Typically the host grain is orthoclase or microcline, and the lamellae are albite

Antiperthite

- If the reverse relationship exists, i.e. plagioclase contains lamillae of K-rich feldspar, the term **antiperthite** is used.

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 due to flowage and the interstices between plagioclase grains are usually occupied by glass or cryptocrystalline material

.