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 - I**
Module No	**: 16**
Name of the Presenter	**: Ms. Yogita Karkhanis**

Notes:

Texture in Igneous Rocks

- Texture is defined as the intimate mutual relation of the mineral constituents and glassy matter in rock made up of a uniform aggregate
- It is best studied in thin section under the microscope.
- An accurate description of igneous textures requires consideration of four points:

  (a) degree of crystallization or **crystallinity**;

  (b) absolute size of the crystals (the grain) or **granularity**;

  (c) **shape of the crystals**;

  (d) **mutual relationship of crystals**.
- The texture of an igneous rock may, therefore, be regarded as a function of its crystallinity, granularity and fabric.

Crystallinity

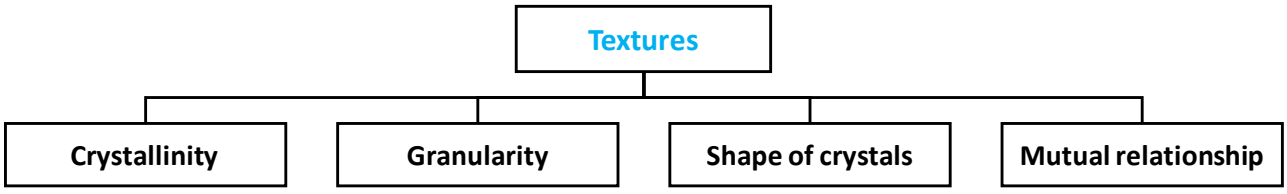
- It is measured by the ratio subsisting between the crystallized and non-crystallized matter.
    - A rock composed entirely of crystals is said to be *holocrystalline*;
    - When it consists wholly of glass, the term *holohyaline* is used; and
    - When the rock is composed partly of crystals and partly of glass, *hemicrystalline* have been used.
- Holocrystalline texture is noted in plutonic as well as hypabyssal rocks.
- The hemicryatalline/hypocrystalline is common in most volcanic rocks.
- While holohyaline types are exhibited by volcanic rocks due to sudden cooling.

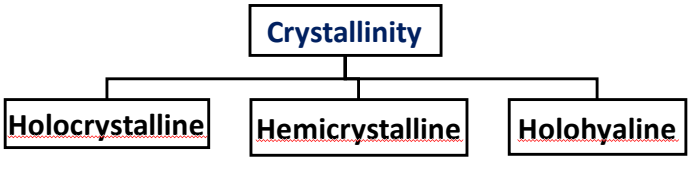
Granularity

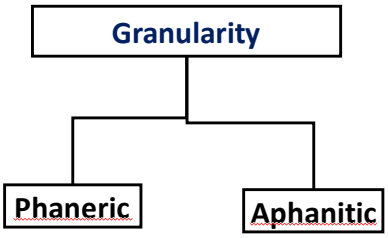
- The absolute size of crystals in igneous rocks ranges from almost sub-microscopic dimensions to crystals measurable in yards.
- If crystals are visible to the naked eyes or with the aid of a pocket lens, the rock is said to be a *phenocrystalline* or *phaneric*.
- If, on the other hand, the individual crystals cannot be distinguished in this way, the term *aphanitic* is used.
- Phaneric rocks:
    - **Coarse** grained – Average diameter > 5 mm → **Plutonic**
    - **Medium** grained – Average diameter 5 mm to 1 mm → **Hypabyssal**
    - **Fine** grained – Average diameter < 1 mm → **Volcanic**

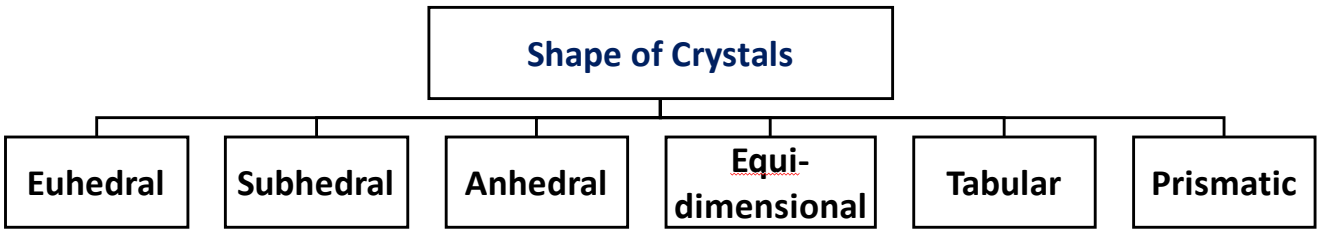
Shape of crystals

- The fabric or pattern of a rock depends on the shape, and on the relative sizes and arrangement of the crystals.
    - **Euhedral** - when the crystal exhibits well formed faces;
    - **Anhedral** - when crystal faces are absent.
    - **Subhedral** - sometimes used for an intermediate stage of development.
- Crystal shapes may also be described with reference to their relative dimensions in three directions.
- Equidimensional crystals-those which are more or less equally developed in all directions; e.g. garnet.
- Tabular- Crystals better developed in two spatial directions than in third; e.g. micas.
- Prismatic- Crystals better developed in one direction than the other two; e.g. hornblende.








Shape of Crystals
Euhedral
Subhedral
Anhedral
Equi-dimensional
Tabular
Prismatic