

Texture of Igneous Rocks

The texture (sometimes referred to as structure) of an igneous rock is the term used to describe the dimensions, shape, and arrangement of minerals in igneous rocks. The main textures are as follows:

- Describes the arrangement of minerals
- Informs about cooling processes

Types of igneous rocks	Texture names	Varieties
Plutonics rocks	Grainy textures	Normal grainy texture Porphyroidal grainy texture Pegmatitic texture Aplitic texture
	Microcrystalline textures	Normal micro-grained texture Porphyritic micro-grained texture
Volcanics rocks	Glass	Microlitic Texture
	Glassy textures	Porphyritic microlitic texture` Glassy textures (hyaline)

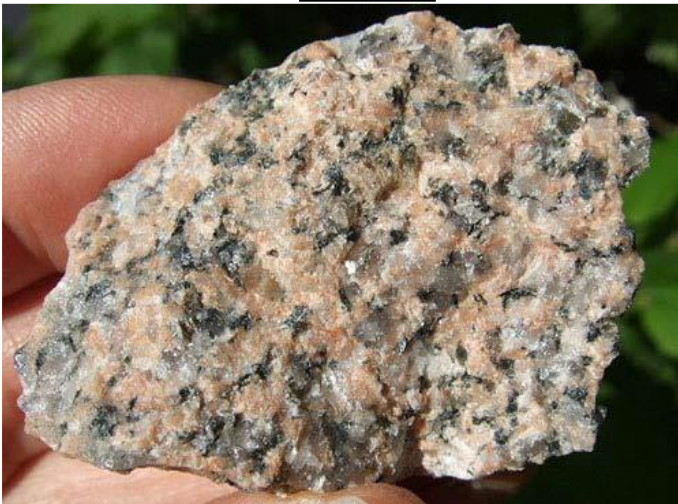
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A. Grainy texture:

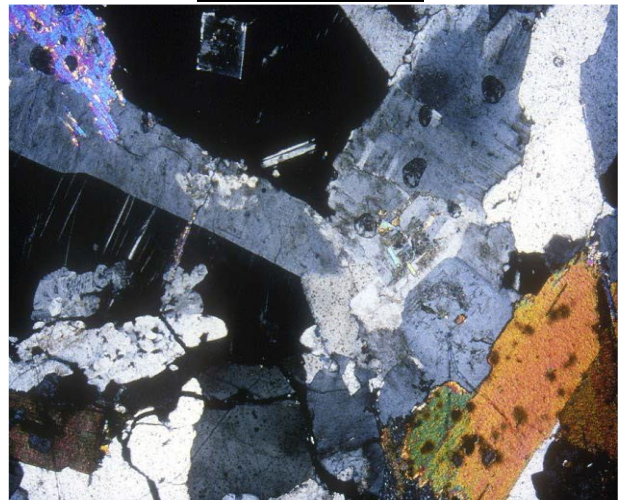
slow-cooling rocks formed at depth (plutonic rocks + mantle rocks)

- ✚ The grainy texture (etym. "grainy") characterizes a holocrystalline rock (fully crystallized) whose minerals are visible to the naked eye (phenocrysts).
- ✚ It characterizes rocks formed at depth (examples: gabbro in the oceanic crust, granite in the continental crust), by slow cooling, which allowed the crystals to grow reasonably well.
- ✚ Igneous rocks with a grainy texture are called plutonic rocks (intrusive rocks). This term comes from the word pluton, which refers to the deposit of plutonic rocks in the form of large masses intruding into the crust during their formation.

Macro



Thin section

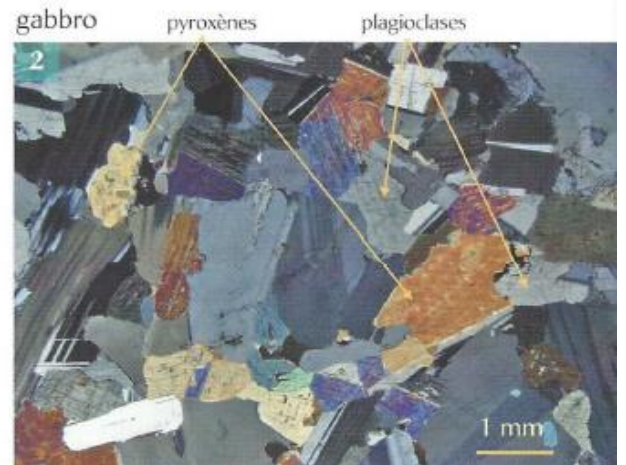


Grainy texture

Plutonic rocks
Plutonic rocks (and mantelic rocks: peridotites example of Gabbro

Fully crystalline rock (or hydrocrystalline):
Crystals visible to the naked eye
Example: Gabbro

Exemple d'un gabbro

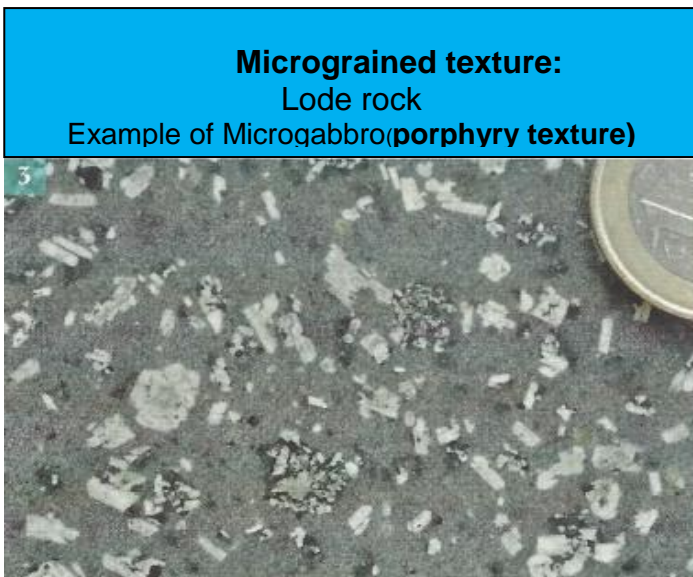


Textures of igneous rocks. According to BEAUX et al. (2011).

B. Micrograined texture:

rocks that cool relatively slowly (vein rocks)

- ✚ The micrograined texture characterizes a holocrystalline rock (fully crystallized) in which some of the minerals are invisible to the naked eye (microcrystals), forming a paste. Phenocrysts (visible to the naked eye) may or may not be present.
- ✚ It characterizes rocks formed at medium depth (e.g., microgranite in the continental crust), by relatively slow cooling, which allowed the crystals to grow but without reaching a size visible to the naked eye.
- ✚ Igneous rocks with a micrograined texture are called microplutonic rocks or vein rocks. Their deposit mode is often a vein, a flat tongue measuring a few centimeters to tens of centimeters.

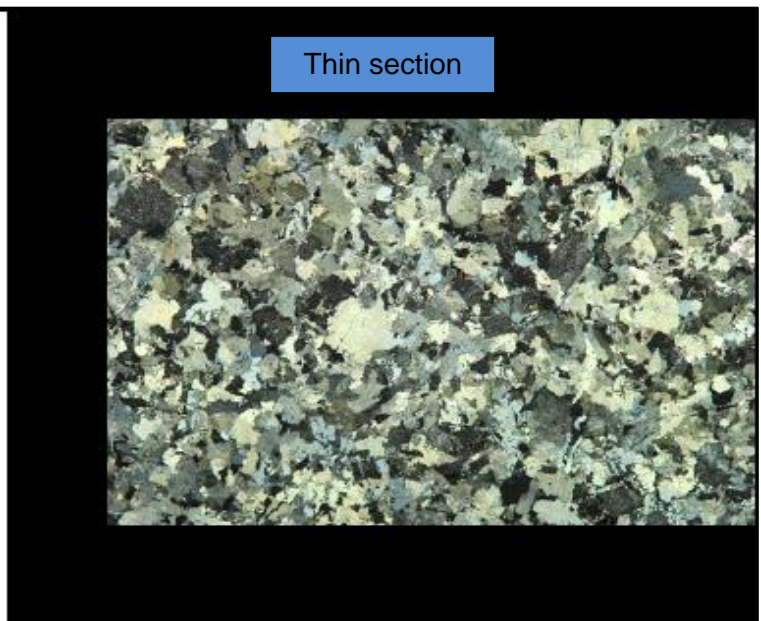
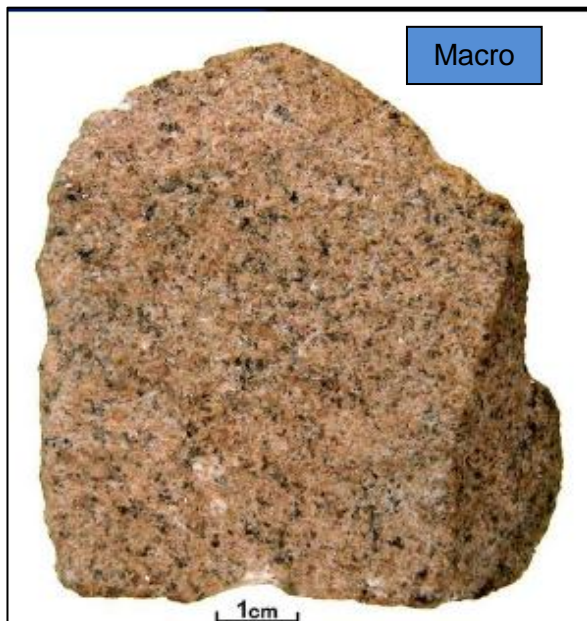


Micrograined texture:
Lode rock
Example of Microgabbro (porphyry texture)



Fully crystallized rock:
Small crystals, visible under a microscope

Textures of igneous rocks. According to BEAUX et al. (2011).



C. **Microlitic texture:** rapidly cooling rocks, formed on the surface (volcanic rocks)

- ✚ The microlitic texture characterizes a hemicrystalline rock (partially crystallized) with crystals visible to the naked eye (phenocrysts), microcrystals, often rod-shaped, visible only under a microscope (microlites), and a non-crystallized mass (glass) in which the crystals are contained.
- ✚ It characterizes rocks formed at shallow depths (examples: basalts in the oceanic crust, andesites or trachytes at the continental level), by rapid cooling, which explains why part of the mass did not have time to form crystals.
- ✚ Igneous rocks with a microlitic texture are called volcanic rocks (effusive rocks). They are emitted in the form of lava that solidifies on the surface by structures called volcanoes.

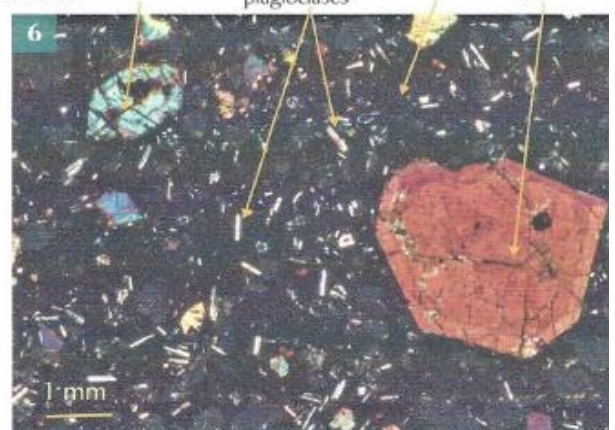
Microlitic texture:
Volcanic rock
Example of Basalt (**porphyry texture & vacuolar**)

Exemple d'un basalte (ici, texture porphyrique et vacuolaire)



**Rocks showing scattered crystals
In uncrystallized glass
(hemicrystalline rock)**

basalte olivine microlites de plagioclases verre pyroxène



Textures of igneous rocks. According to BEAUX et al. (2011).

Note:

There are even rocks composed entirely of glass (**glassy texture**), such as obsidians. These are volcanic rocks that have cooled extremely abruptly.