

Texture of Igneous Rocks

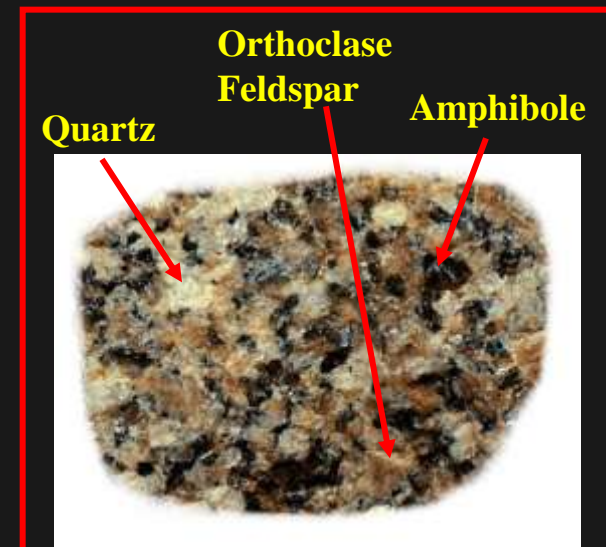
- **Remember:**
 - describes the appearance of an igneous rock, based on the *size, shape* and *arrangement* of interlocking crystals.
 - gives clues to the type of environment in which the molten rock crystallized.
- 5 common textures in igneous rocks are:
 - 1) Coarse grain (phaneritic)
 - 2) Fine grain (aphanitic)
 - 3) Porphyritic
 - 4) glassy
 - 5) Vesicular

Reference:

Tarbuck and Lutgens
Pages 62-69, CD 265-295,
1019, 1022

1) Coarse Grain Texture

- forms deep beneath the surface in a plutonic environment where the molten rock cools slowly.
- larger crystals of uniform size.
- also called Phaneritic texture.
- minerals can be identified with the unaided eye.
- **Examples:** Granite, Gabbro, Diorite



2) Fine Grain Texture

- forms at or near the Earth's surface in volcanic environment where the molten rock cools quickly.
- very small crystals (only seen under microscope)
- may contain vesicles (gas bubbles)
- also called Aphanitic texture.
- minerals are not identified with the unaided eye.
- **Examples:** Basalt, Andesite, Rhyolite



3) Porphyritic Texture

- this texture results when magma with crystals already formed escape to the surface and cools quickly forming a fine grained igneous rock with large crystals inside.
- this texture is a result of ***two stages of cooling***;
 - 1) slow cooling forming the larger crystals.
 - 2) rapid cooling forming the finer crystals.

Examples: Andesite Porphyry



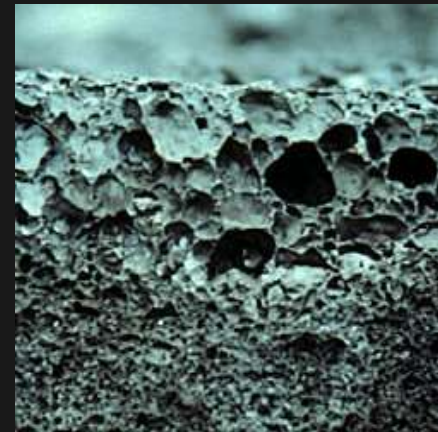
4) Glassy Texture

- forms when the ions in the molten rock do not have time to organize into an orderly pattern to form crystals because it cools very, very quickly.
- the result is volcanic glass.
- minerals can not identified with the unaided eye.
- **Examples:** Obsidian



5) Vesicular Texture

- forms when gas bubbles escape from molten rock and are trapped as it cools and crystallizes.
- this texture can form near the top of lava flows.
- minerals can not identified with the unaided eye.
- **Examples:** Scoria



Sample Problem

- An igneous rock is found to contain both large and small crystals, as shown below. What conditions were necessary for this rock to form?

Answer:

This texture is a result of ***two stages of cooling***;
1) slow cooling forming the larger crystals.
2) rapid cooling forming the finer crystals.