

Igneous Rocks (not in manual)

Igneous Rock- rock solidified from melted rock

Rock Cycle- process that includes recycling of rocks in their three categories: igneous, metamorphic, and sedimentary

Two main categories of Igneous Rocks

Intrusive- solidified beneath the surface. Characterized by longer time to cool and larger grain size.

Extrusive- solidified above the surface. Characterized by shorter cooling time and thus smaller grain size.

Igneous Rock Textures

Most Igneous Rocks have crystalline texture, or rather have interlocking crystals.

Textures based on Grain Size:

Coarse-grained (phaneritic): All crystals large enough to see without aid of a hand lens. Intrusive rocks are phaneritic (slow cooling).

Fine-grained (aphanitic): Most crystals too small to recognize without aid of hand lens. Crystals typically less than 1mm. Usually reserved for extrusive rocks (quick cooling).

Glassy: Rock made of glass and lacks crystals. Suggests very fast cooling.

Pegmatitic: Igneous rocks with exceptionally large crystals, usually on the order of greater than 3cm. Results from slow cooling and extra water in the magma.

Porphyritic: Two different sizes of crystals present in the rock. The larger crystals are **phenocrysts** and the smaller crystals are the **groundmass**. You will notice a distinct difference, it isn't slightly bigger or smaller.

Vesicular: Bubbles that form in a lava will leave air cavities behind. These are **vesicles**.

Mineral Composition

1. Dark-colored igneous rocks are rich in plagioclase and pyroxene/olivine. These rocks are **mafic**.
2. Light-colored igneous rocks are called **felsic**. They commonly contain feldspars (mainly potassium), quartz, and some dark minerals (biotite and hornblende).
3. **Intermediate** igneous rocks are generally not light or dark and contain both light and dark minerals. Diorite is an example of an intermediate rock.

How do we figure out which minerals crystallize first?

Bowen's Reaction Series:

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