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ROCKS

Definition, formation and classification Igneous, sedimentary and metamorphic rocks

- **Rocks are the materials that form the essential part of the Earth's solid crust.**
- **A rock may be defined as a hard mass of mineral matter comprising two or more rock forming minerals.**



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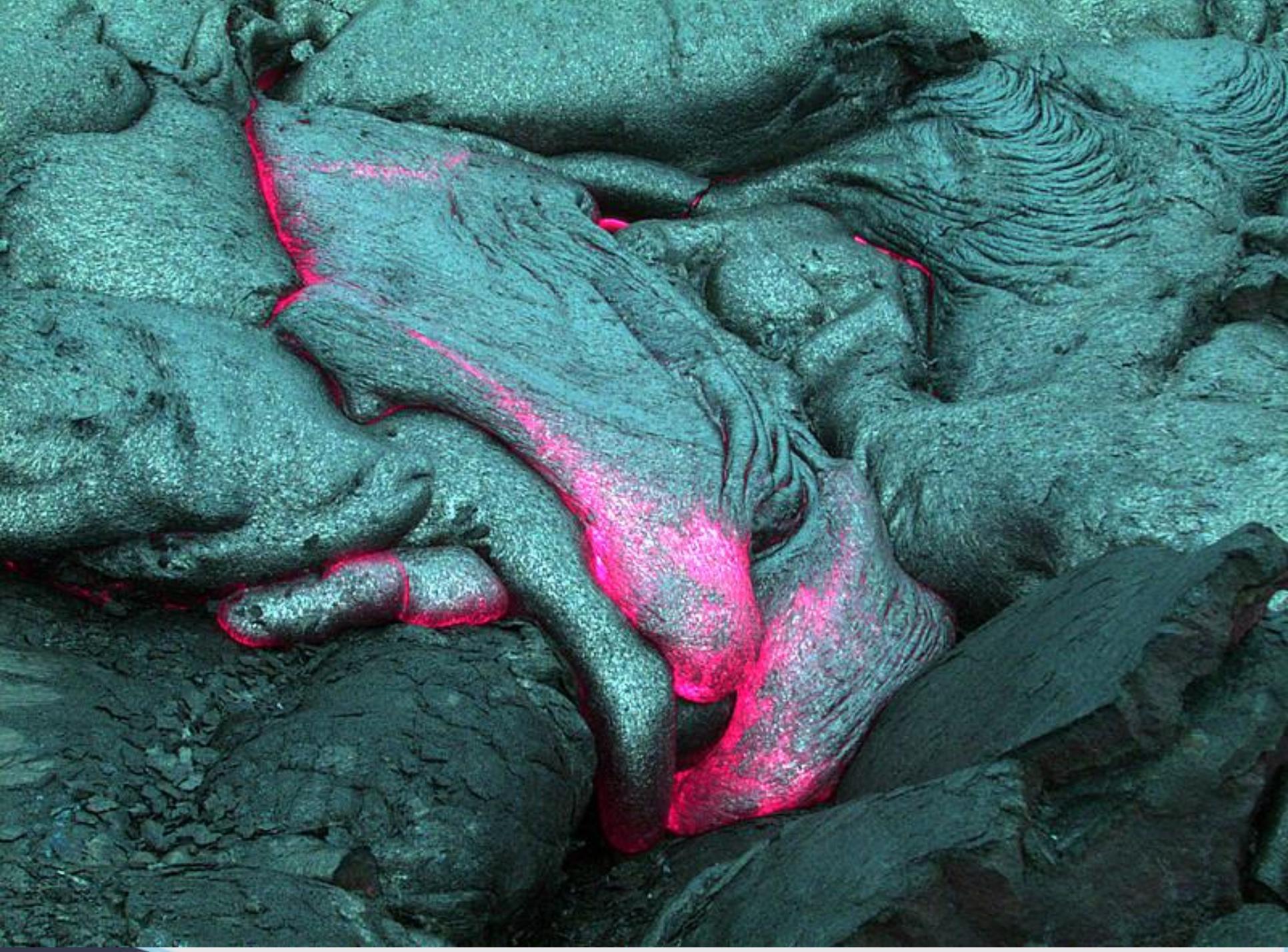
- **Petrology** (in Greek, *petra* means rock, *logos* means science) deals with science of rocks. It consists of
 - **Petrography** which deals with the description of rocks.
 - **Petrogenesis** which is the study of the origin of rocks.



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Formation of rocks

- Cooling and consolidation of molten magma within or on the surface of earth results in the formation of Igneous or **Primary rocks**





Based on the mode of origin Igneous rocks are classified as

- **Extrusive rocks (or volcanic rocks)**
- **These rocks are formed due to the consolidation of magma on the surface of the earth. The magma, when flows on the Earth surface is called LAVA. eg. Basalt**



Intrusive rocks (or plutonic rocks)

- These rocks are produced due to solidification of magma **below the surface of the earth**. These intrusive rocks solidifies at greater depths. eg. Granite.



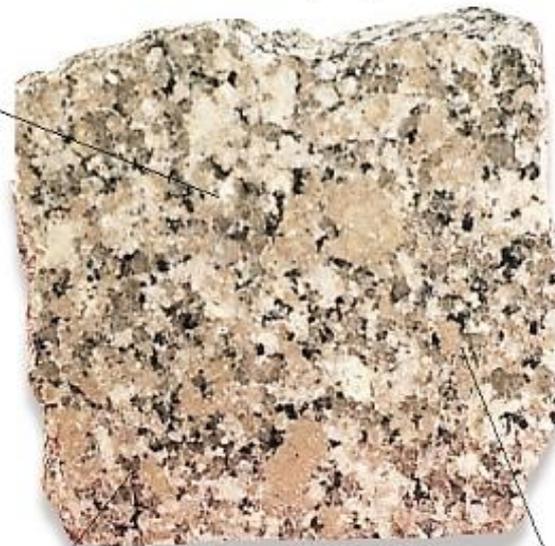
IGNEOUS ROCK

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Quartz (mineral)

Granite (rock)



Biotite (mineral)



Feldspar (mineral)

Based on chemical composition **Igneous rocks may be divided into**

- Acid rocks :> 65% silica (Granite, Rhyolite)
- Sub acid rocks: 60-65% Silica (Syenite, trachyte)
- Sub basic rocks : 55-60% silica (Diorite, andesite)
- Basic rocks: 45-55% silica (Gabbro, basalt)



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High Silica content forms light-colored rocks.





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While lower (but only by about 25%) Silica content forms darker-colored rocks





Sedimentary or Secondary rocks

- Disintegration and decomposition lead to the breaking down of pre-existing rocks. Transportation and cementation of primary rocks results in the formation of **Sedimentary or Secondary rocks**





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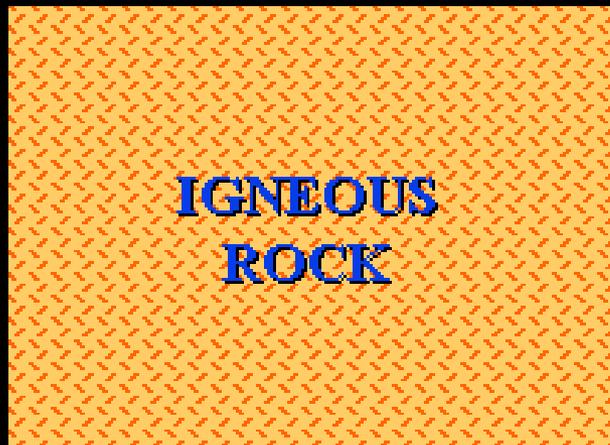
Metamorphic rocks

- The primary and the secondary rocks when subjected to earth's movement and to high temperature and pressure are altered to new rocks called **Metamorphic rocks**

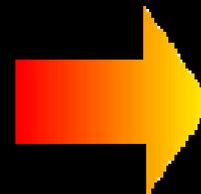
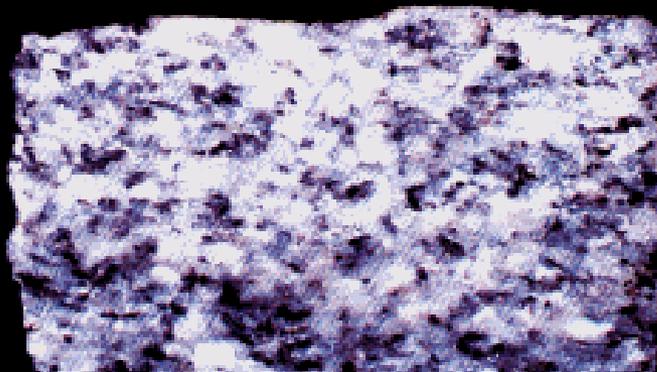
METAMORPHIC ROCKS

Formed from other rocks

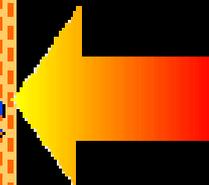
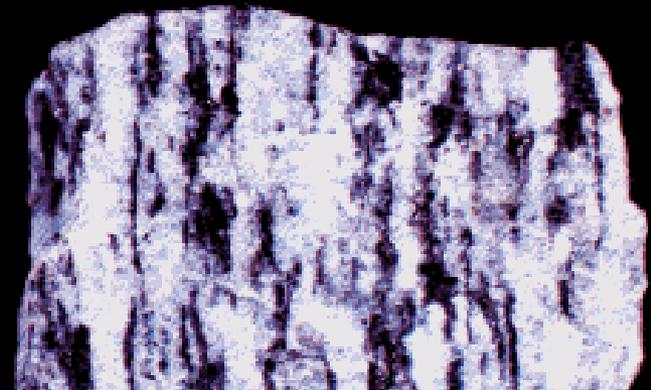
Changed under heat and pressure



GRANITE



GNEISS



Heat
Pressu