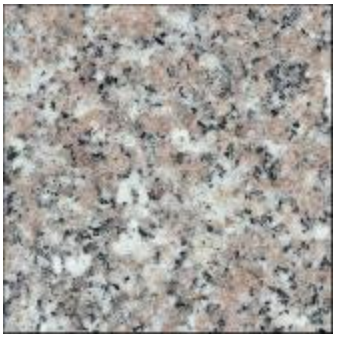
12. Lithosphere – Chemical Laboratory of the Earth – the Earth's Crust

Almost all the chemical elements are represented in the upper part of litosphere. A **mineral** is an element or chemical compound that is normally crystalline and has defined chemical compision. The most spreaded minerals are **silicate minerals.** They are combination of oxide, silicon and some other metals. The most common are **quartz**, **mica** and **feldspar**.

Rocks are compositions of minerals or organic remains. There are three groups of rocks according to the origin:

- *igneous rocks*
- *sedimentary rocks*
- *metamorphic rocks*

Figure 1: Granite



Igneous rocks

Igneous rocks are created by crystallisation of silicate minerals. This process can take place in **magma** (within the Earth Crust) or in **lava** (on the Earth's surface). **Intrusive igneous rocks** are formed in magma and **extrusive igneous rocks** in lava.

- Intrusive igneous rocks:
  - ***Granite*** – use: building stone
- Extrusive igneous rocks:
  - ***Basalt*** – use: building stone, paving
  - ***Andesite*** – use: decorative stone, paving

Figure 2: Limestone

Sedimentary rocks

Sedimentary rocks are formed by deposition of the weathered material from the older rocks. Mechanical and chemical decomposition of rocks is called **weathering**.

- ***Sandstone*** – use: building stone, decorative stone
- ***Claystone***
- ***Pudding stone*** – use: building stone (aggregate)
- ***Limestone*** – use: building stone, cement, in metalurgy
- ***Dolomite*** – use: building stone, cement, in metalurgy
- ***Travertine*** – use: decorative stone

Figure 3: Marble

Metamorphic rocks

In depth of the Earth's Crust metamorphic rocks are created by **metamorphism** of the igneous and sedimentary rocks. This change (conversion) is caused by **great heat and pressure** within the Earth.

- ***Marble*** – crystalline limestone, use: decorative stone

Keywords
chemical element and compound, silicate minerals, oxide, silicon, quartz, mica, feldspar, igneous/sedimentary/metamorphic rocks, crystallisation, magma, lava, granite, andesite, basalt, weathering, sandstone, claystone, pudding stone, travertine, limestone, dolomite, marble, metamorphism