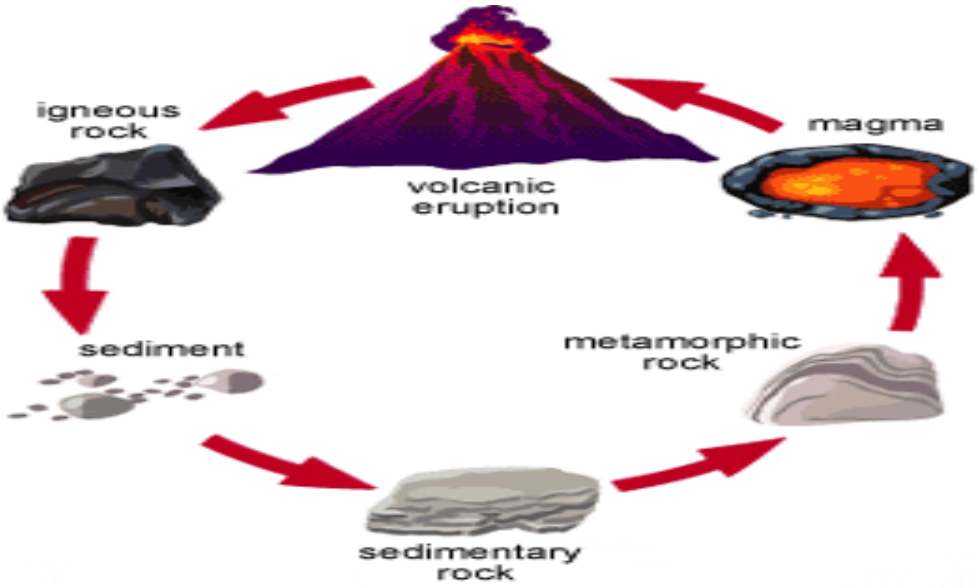
rock life cycle



Igneous rocks

They are the rocks resulting from the cooling and solidification of molten materials, and these materials may remain in the earth's crust and are called magma, and their temperature ranges between 600°-1300°C, or it may reach the surface of the earth and is called Lava, and it is one of the types of rocks The three are in addition to the sedimentary and metamorphic rocks, and igneous rocks constitute 95% of the area of the upper part of the earth's crust, a large part of which is covered by a thin layer of sedimentary and metamorphic rocks, and more than 700 types of igneous rocks have been discovered, most of which were formed under the surface of the earth, and they are called Igneous rocks that form under the surface of the earth - and make up most of the igneous rocks - underground rocks as (Intrusive Rocks or Plutonic Rocks), and the rocks that form on the surface of the Earth are called (Extrusive Rocks or Volcanic).

Igneous rocks are classified into two types:

A - subterranean igneous rocks

They are rocks that form when magma cools inside the earth very slowly - up to thousands or millions of years - until it solidifies, and this allows minerals to crystallize and form slowly, so its size is large, and it is characterized by a coarse granular texture, and the most important rocks of this type are: -

1- Granite

Granite is a medium to coarse-grained subterranean igneous rock, and it consists of the minerals Quartz and Feldspar, which makes it rich in silica, potassium, and sodium. Granite is found in several light colors: red, pink, gray, and white.

2- Granodiorite

It consists of black biotite and transparent gray quartz, and it appears in a rust-like color, which indicates the weathering processes that liberate the iron element.

3- Gabbro

It consists of coarse grains of the minerals feldspar and olivine, and is characterized by its black or dark green color.

4- Diorite

It is located between the granite and gabbro rocks in terms of composition, and it consists of black hornblende minerals, and is distinguished by its black and white color.

b- superficial igneous rocks

These rocks are formed when magma comes out to the surface of the earth and is then called lava and cools and hardens quickly due to exposure to relatively low temperatures. Hot gas bubbles are often trapped inside the rocks, forming a bubble tissue. The most important rocks of this type are:

1- Rhyolite

Rhyolite is similar to granite, but its crystals are smaller. It is classified as a superficial igneous rock. It consists of quartz, feldspar, mica, and hornblende minerals.

2- Andesite

Andesite is a superficial igneous rock, and it contains a very high percentage of silica, which is higher than that of basalt rocks but lower than that of feldstine.

3- Basalt

Basalt is a surface or subterranean rock, and it constitutes a large part of the oceanic crust, and because basalt grains are very small, its minerals cannot be seen with the naked eye. in underground rocks.

4- Latite

It consists largely of alkali feldspar, and little or no quartz, and monzonite rocks from plutonic rocks, but this rock is more complex.

5- Komatiite

komatiite is a very ancient and rare surface rock, corresponding to peridotite from plutonic rocks, and it is assumed that it was formed when the temperature of the mantle was very high 3 million years ago, and it contains a

high percentage of olivine, which makes its composition similar to the composition of the components of peridotite.

Composition superficial igneous rocks

Surface igneous rocks are characterized by their smooth texture and small crystals as a result of the rapid cooling process of the magma on or near the surface of the earth, which prevents mineral crystals from forming in a large and apparent size. Surface igneous rocks are formed in two ways:

1- The non-explosive method: Lava is of low viscosity and low in gases, and appears in the form of a fountain as a result of the loss of gases, and then flows and flows on the surface of the earth or flows in the form of pillows if it explodes under water.
2- The Explosive Method: The magma is highly viscous and saturated with gases. When high-pressure gas bubbles explode when they reach the surface of the Earth, the pressure decreases, causing the magma to break up into clastic rocks, and these gases rise forming a column that can reach a height of 45 km.

Sedimentary rocks

What are the types of sedimentary rocks?

1- Clastic rocks

Detrital sedimentary rocks consist mainly of crumbs and remains of rocks that were subjected to mechanical weathering processes, as they were transported by transport factors, deposited and accumulated on top of each other, and then exposed to pressure factors that led to their formation, and they differ in their types based on the size of the grains that make up them, starting with the

clay grains Which are seen under a microscope, and end with huge granules, and the most important of them are:-

1- Quartzite rocks are called by this name because they are mainly composed of quartz grains.

2- Mudstone consists mainly of quartz and clay, and the size of its grains is small.

3- Seen with a microscope. Siltstone consists of small grains, which are known to be coarse compared to clay.

2- Chemical rocks

Chemical sedimentary rocks are produced as a result of the accumulation of dissolved ions in the seas and oceans resulting from weathering processes, and when the water begins to evaporate, the concentrations of ions increase. Chemical sedimentary rocks, the most important of which are:

1- Limestone Rocks Limestone consists of the mineral calcite and is used in the manufacture of building materials.

2- Rock salt, known as halite, and consists mainly of sodium chloride salts, and is produced due to the evaporation of salt water containing chlorine and sodium ions.

3- Gypsum: Gypsum consists of sulfates, and is characterized by being soft in texture, and is used in the manufacture of plastics.

3- Chart consists of mineral crystal grains besides quartz, and it has a smooth texture, and it is in several colors, including white and cream.

3- Organic Sediments

Organic rocks are formed as a result of the accumulation of the remains of plant or animal organisms that have accumulated and solidified over time, and its types are coal, which consists mainly of the element carbon, and is formed as a result of the accumulation of plant residues in the absence of oxygen, and it is one of the most important sources of energy as it is burned to use it as fuel.

Metamorphic rocks

Metamorphic rocks are defined as rocks that have gradually changed and transformed from one rock type to another, in response to the surrounding environmental conditions such as high temperature or pressure, which leads to physical, chemical, and mineral changes on the rock, knowing that it forms inside the earth's crust, and forms Metamorphic rocks account for a large amount of the earth's crust rocks, and many valuable materials are formed by metamorphisms, such as: marble, and many types of precious stones; almas.

metamorphic rock formation

Metamorphic rocks are formed when igneous or sedimentary rocks melt together by high heat and pressure, or as a result of exposure to liquids rich in hot minerals, or from a combination of these factors. These conditions are referred to in the depths of the earth, or in areas where tectonic plates meet, and these rocks are formed Under the ground due to the accumulation of layers of rock that form the surface of the earth through various geological processes, and over time, the weight of the modern surface layers pushes the old layers down,

which leads to an increase in heat, pressure, and gravity on these rocky layers; Which leads to a gradual transformation of the characteristics of these rock formations. It is noteworthy that the transformation process does not lead to the melting of the rocks, but rather its transformation into more compact and compact rocks, and more dense, and new minerals are formed by rearranging the mineral components, or by interactions with fluids that Rocks enter, and pressure or temperature can also transform metamorphic rocks into new types of metamorphic rocks There are two basic types of metamorphic rocks, namely: -

1- Foliated metamorphic rocks such as: gneiss, phyllite, schist and shale. (slate)

2- Non-foliated metamorphic rocks such as: marble and quartzite.