**Rock cycle**

The rock cycle is a crucial geological concept that defines the perpetual process of recycling and transformation of rocks on the surface of the earth. This process entails the formation, alteration, and ultimate breakdown of various types of rocks through a complex series of interconnected procedures. The rock cycle involves the formation of three different types of rocks, including igneous, sedimentary, and metamorphic rocks, which exhibit distinct characteristics in terms of texture and composition.

The formation of igneous rocks occurs as the molten magma solidifies, displaying a diverse composition of minerals such as feldspar (KAlSi3O8), mica (XY2-3Z4O10(OH)2), Calcite (CaCO3), quartz (SiO2), and pyroxene (XYSi2O6). Igneous rocks can have two core textures: extrusive (Volcanic) or intrusive (plutonic). Intrusive rocks are characterized by larger crystals that form due to slow cooling down of the magma while extrusive rocks have finer-grained textures as a result of rapid rate of cooling on the surface of the earth. Sedimentary rocks result from sediment accumulation and lithification. These rocks comprise various minerals such as calcite, quartz, and clay. Sedimentary rocks have varying textures such as include clastic, which forms from fragments, organic texture which forms from living organisms, and chemical textures which result from precipitated solution. The formation of metamorphic rocks occurs as a result of alteration of existing rocks under pressure, high temperatures, or chemically active fluids. The mineral composition of metamorphic rocks is by metamorphic conditions and original rocks. Metamorphic rocks display foliated textures which are characterized by branded or layered appearances due to mineral alignment or non-paginated textures with equidimensional crystals.

Igneous rocks are characterized by varied types of textures, including aphanitic texture, which comprise very and fine-grained rock crystals. Phaneritic texture is characterized by large crystal that can be seen by naked eyes. Porphyritic texture has large crystals are finer-grained or glassy, and can occur in coarse, medium and fine-grained igneous rocks. Vesicular texture is a volcanic rock texture that has tiny holes called vesicles on its surface and inside. Glassy texture comprises of a block that has no visible mineral crystals, it has a glassy texture due to cooling that was extremely fast that no crystals could form while pegmatitic texture displays a very coarse texture, with large interlocking crystals usually greater in size than 1 cm.

Igneous rocks may be simply classified according to their chemical or mineral composition as ultramafic, mafic, intermediate and felsic. Ultramafic are igneous and meta igneous rocks with a very low silica content (less than 45%), generally >18% MgO high FeO, low potassium, and are composed of usually greater than 90% mafic minerals (dark colored, high magnesium and iron content). Mafic rocks contain olivine, pyroxene, amphibole, and biotite minerals. Common mafic rocks include basalt, diabase and gabbro. Intermediate mineral composition refers to the chemical composition of a rock that has 51.5–63 SiO2 being an intermediate between felsic and mafic compositions. Felsic refers to silicate minerals, magma, and rocks which are enriched in the lighter elements such as silicon, oxygen, aluminum, sodium, and potassium. It is contrasted with mafic rocks, which are relatively richer in magnesium and iron.

Types of igneous rocks

Peridotite is an intrusive ultramafic igneous rock

Basalt is an extrusive mafic igneous rock

Gabbro is an intrusive mafic igneous rock,

Andesite is an extrusive igneous rock that is an intermediate in composition between mafic and felsic rocks

Diorite is an intrusive igneous rock that is an intermediate between that of mafic gabbro and felsic granite

Rhyolite is an extrusive felsic igneous rock

Granite intrusive is a felsic igneous rock

There are three types of volcanos including active, dormant, and extinct volcano. Active volcano entails a volcano that has recently erupted recently or has the potential to erupt in the future. Dormant volcano has not erupted in a long time but have the potential to erupt again in the future. Extinct volcanos are those that have not erupted for long and show no signs of erupting again.