

TENDER HEART HIGH SCHOOL

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CLASS : VII

Chapter 4

(1) Introduction

- Weathering describes the means by which soil, rocks and minerals are changed by physical and chemical processes into other soil components.
- Weathering may proceed rapidly or slowly over a decade depending upon the soil forming factors in an area.
- The development of soil reflects the weathering process. Moreover, the factors affecting the formation of soil are :

(a) Parent Material (b) Climate (c) Living Organisms (d) Topography (e) Time

(a) Parent Material

- When climate, living organisms, topography and time acts on parent material, it is weathered into smaller particles forming soil.
- There are many types of parent material with different mineral content. These parent material can be the rock or the remnant of rock.

Introduction

- Rocks are the naturally occurring material that forms the crust of the Earth. Moreover, it is the collection of different minerals and it is found in different colour, size and texture.
- Mostly Rocks are categorised according to mineral and chemical composition present in it and the way in which they are formed.
- Rocks forms the Earth's solid layer, which is also referred as **Rocksphere**.
- The Scientific study of Character and Origin of Rocks is known as **Petrology**; which is an essential part of **Geology**.

Difference between Rocks and Minerals

ROCKS	MINERALS
→ Rocks are considered as aggregates of mineral elements.	→ Minerals are naturally occurring solid inorganic substances.
→ Rocks are heterogeneous in form.	→ Minerals are Homogeneous in form.
→ Rocks has no definite chemical composition.	→ Minerals have a definite chemical composition.
→ Major rocks are Igneous Rocks, Sedimentary Rocks and Metamorphic Rocks.	→ Major mineral groups are Silicates, Carbonates, Sulphides and metallic minerals.

Importance of Rocks

- When Rocks are disintegrated into fine particles, it results in the formation of soil upon which all the agricultural activities depend.
- Rocks helps us in acquiring knowledge about past animals, environment and plants that are now extinct because all the fossils are found in rocks.

- Rocks contains variety of minerals that are useful for Industries such as Iron, Copper, Marble, Granite etc.
- Rocks provide basic material for construction of Roads, Dams, Buildings etc.
- Rocks also have reserves of Coal, Petroleum and Natural Gas.
- Gold a precious mineral found in rocks helps to know the value of a nations currency.
- Rocks also acts as shelter for many organisms, as sometimes it is seen that many organisms make their shelter in the cracks of the rocks.
- Rock Salt extracted from sedimentary rocks is used in cooking.
- The Study of Rocks helps to know about the formation of Earth, past climate and movement of Tectonic Plates.

(3) Types of Rocks and their Classification

(A) IGNEOUS ROCK:

- These are those rocks that are formed due to cooling, solidification and crystallisation of Hot Lava.
- Igneous Rocks are the first rocks that were formed on the Earth's Crust, so they are also known as Primary Rocks.
- Since all the other rocks are formed directly or indirectly from Igneous Rocks, so these rocks are also known as Parent Rocks. eg: Granite, Syenite, Obsidian, Pumice etc.

* Features of Igneous Rock

- These Rocks are Granular and crystalline in Nature.
- These Rocks are hard rocks and water does not percolates through these rocks.
- These rocks are not found in layers due to solidification of Magma.
- These rocks dont contain any fossil.
- These rocks are found in Volcanic Zones.
- These rocks are generally weathered by Mechanical Weathering.

(i) Intrusive Igneous Rocks:

When the rising magma is not able to reach the Earth's surface during a volcanic activity, then the magma cools and solidifies below the Earth's surface. This cooling and solidification of lava forms Intrusive Igneous Rocks. eg: Granite, Tonalite, Monzonite etc.

Intrusive Igneous Rocks are divided into two types:

(a) Plutonic Igneous Rocks:

- These rocks are formed due to cooling of Magma deep inside the earth.
- These rocks are very coarse grained rocks.
- In deep inside the earth, the rate of cooling of magma is very slow due to high temperature, so there is sufficient time for the full development of large grains in these Rocks. eg: Granite, Tonalite etc.

(b) Hypabyssal Igneous Rocks:

These are those rocks that are formed due to cooling and solidification of rising magma during a Volcanic Activity in the cracks, pores, hollows etc below the earth's surface. eg: Dolerite.

(ii) Extrusive Igneous Rocks

- These rocks are formed due to cooling and solidification of hot and molten lava on the Earth's surface.
- These rocks are formed during fissure type of volcanic eruption. Moreover, they are also known as Volcanic Rocks.
- These rocks are fine grained because the lava is cooled and solidified very quickly as soon as it reaches the surface of the Earth.
- eg: Basalt, Gabbro, Obsidian etc.

(B) Sedimentary Rocks:

- These are those rocks that are formed due to deposition of organic particles on the Earth's surface.
- Moreover, when weight and pressure of the overlying layers consolidates the organic particles that is deposited, it forms sedimentary rocks.
- These rocks are formed in layers and they are deposited in or near the waterbodies.
- These rocks are also known as stratified rocks, layered rocks or secondary rocks.
- eg: Limestone, Dolomite etc.

Features of Sedimentary Rocks

- These rocks are formed from the sediments of older rocks, plants and animal remains.
- These rocks are found in layers.
- These rocks are found in or near the waterbodies.
- These rocks possess different size of joints.
- These rocks are formed perpendicular to bedding plane.
- Folds and Faults are the special feature of sedimentary rocks.
- Most of the sedimentary rocks are permeable and porous.

(1) Mechanically Formed Sedimentary Rocks:

These rocks are formed by fragments of pre-existing rocks with the help of process of weathering and Erosion. Moreover, these rocks are sub-divided according to their Grain Size.

Some important Sedimentary Rocks are:

(a) Sandstone:

- It is formed due to deposition, cementation and consolidation of Sand Grains.
- The grains of Sandstone vary in size and they can be coarse, medium or fine in texture.
- eg: Silica, Iron Oxide etc.

(b) Conglomerate:

- It is formed due to cementation and consolidation of Pebbles of various size together with sand.
- eg: Crestone Conglomerate.

(c) Shale:

- It is formed due to deposition and cementation of Fine Sediments of Silt and Clay.
- It is least affected by weathering and it is also insoluble in nature.
- eg: Bakken Shale (North Dakota), Eagle Ford Shale (Texas) etc.

(d) Silt Stone:

- It is a clastic Sedimentary Rock that has more content of silt and less content of clay.

(2) Organically Formed Sedimentary Rock:

- These rocks are formed from the remains of plants and animals.
- These rocks are also called Fossils.

Some Important rocks of this type are:

(a) Calcareous

- They are formed due to deposition and consolidation of sediments that is derived from the skeletons and Lime containing Animals.
- These rocks are also known as carbonate rocks.
- eg: Limestone, Calcium carbonate etc.

(b) Carbonaceous Rocks:

- These rocks are dominated by carbonic materials.
- They are formed due to transformation of vegetation inside the earth under weight and pressure.
- eg: Lignite, Bituminous etc.

(c) Silicious Rocks:

- They are formed due to aggregation and compaction of wastes that is derived from radiolarians, Organisms, Diatom plants etc.
- eg: Diatomite etc.

3. Chemically formed Sedimentary rocks:

- These rocks are formed when chemically active water comes in contact with substance.

Some rocks of these type are:

(a) Gypsum:

- It is a soft rock that forms in lagoons where ocean water with high calcium content slowly evaporates.
- It is very useful in cement Industry, Plaster products etc.

(b) Chert:

- It is a hard fine grained rock that is composed of Microcrystalline and Cryptocrystalline quartz.
- This rock is found in different colours like grayish Brown, Light green etc.

(c) Travertine:

- This rock is formed due to chemical precipitation of calcium carbonate minerals from fresh water source like Rivers, Lakes etc.
- It is mostly used in building material.