CHAPTER -5

MINERALS AND ROCKS

- **Minerals are naturally occurring inorganic substance having an orderly atomic structure and definite chemical composition and physical properties.**
- **A mineral is composed of two or more elements. But some time single element minerals like sulphur, copper, silver and gold are found.**

PHYSICAL CHARECTERISTICS

- **External crystal form**
- **Cleavage**
- **Fracture**
- **Lustre**
- **Colour**
- **Streak**
- **Transparency**
- **Structure**
- **Specific gravity**
- **Hardness**

MAJOR MINERALS

1. **Feldspar**
2. **Quartz**
3. **Pyroxene**
4. **Amphibole**
5. **Mica**
6. **olivine**

Feldspar:-

- **Silicon and oxygen are common elements in all types of Feldspar**
- **Half of the earth crust is composed of Feldspar**
- **It has light cream to pink colour**
- **It is used in ceramics and glass making**

Quartz

- **Quartz is the most important components of sand and granite.**
- **It is hard mineral insoluble in water.**
- **It is white colour**
- **Used for radio and radar.**

Pyroxene

- **Pyroxene forms 10 % of the earth crust.**
- **It is commonly found in meteorites.**
- **Green or black colour.**

Amphibole

- **Amphibole forms 7 % of the earth crust.**
- **Green or black colour.**
- **Used in asbestos industry**

Mica

- **Mica forms 4 % of the earth crust.**
- **It is commonly found in igneous and metamorphic rocks**
- **It is used in electrical instruments**

Olivine

- **It is used in jewellery.**

- **It is usually a greenish crystal.**
- **Found in basaltic rocks.**

ROCKS

- **A Rock is an aggregate of one or more minerals.**
- **Rocks varied in structure, colour, size, occurrence and origin …..**
- **Petrology is science of Rocks.**
- **Rocks are grouped three families on the basis of their mode of formation.**

TYPES OF ROCKS

Rocks are broadly classified in to three on the basis their origin.

They are

1. **Igneous Rocks.**
2. **Sedimentary Rocks.**
3. **Metamorphic Rocks**

IGNEOUS ROCKS

- **Also called Primary Rocks.**
- **The word igneous originates from Latin which means fire.**
- **Igneous rock formed from cooling of molten matter.**
- **If molten material cooled slowly at great depth mineral grains may be large**
- **Sudden cooling (at the surface) results in small and smooth grains.**
- **Eg:- basalt, granite and gabbro ...**

SEDIMENTARY ROCKS

- **The word sedimentary derived from Latin word sedimentum means settling.**
- **Rock fragments are transported by different agencies and deposited, these deposits through compaction turn in to rocks this process is called Lithification.**
- **Sedimentary rocks are classified in to three.**
    1. **Mechanically formed. Eg:- sandstone, limeston**
    2. **Organically formed. Eg:- chalk, coal**
    3. **Chemically formed. Eg:- potash, halite**

METAMORPHIC ROCKS

- **The word metamorphism means "change of form".**
- **Metamorphism is a process by which already consolidated rocks undergo recrystallisation and reorganization of materials within original rocks due to the action of pressure volume and temperature.**
- **Eg:- marble, slate and schist ….**

DYNAMIC METAMORPHISM

- **Reorganization of the original minerals within rocks due to the breaking and crushing without any chemical changes.**

THERMAL METAMORPHISM

- **The materials of rocks chemically alter and recrystallise.**
    1. **Contact Metamorphism**
    2. **Regional Metamorphism**

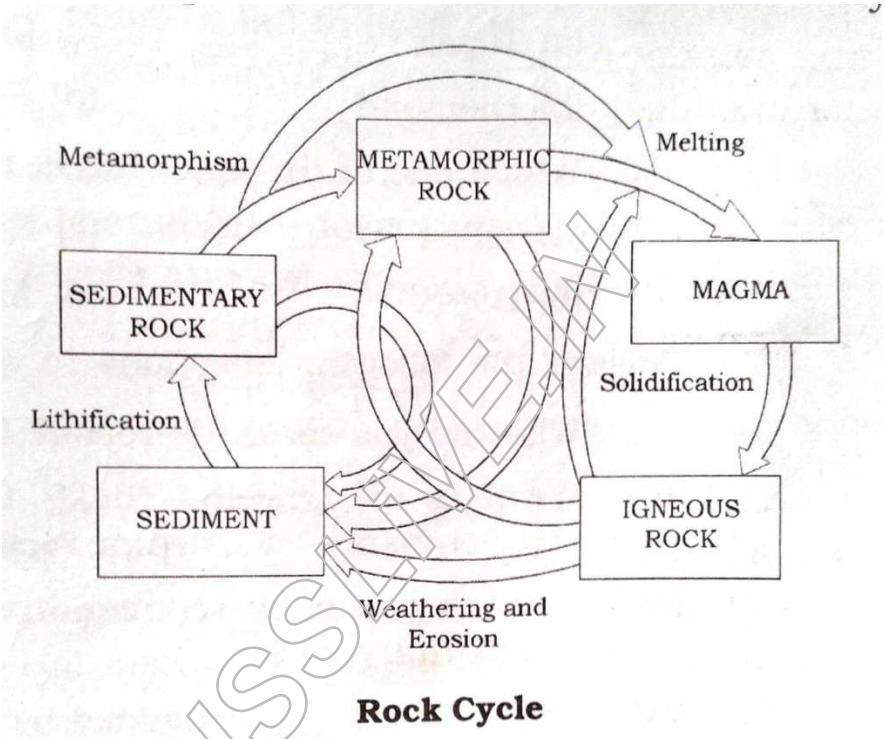
CONTACT METAMORPHISM

- **The rocks come in contact with hot intruding magma and lava and the rock material recrystallise under high temperature.**

- **New materials added to the rocks**
  Regional metamorphism
- **Rocks undergo recrystallisation due to deformation caused by tectonic shearing together with high temperature or pressure or both.**
- **In the process of metamorphism in some rock grains or minerals get arranged in layers or lines such an arrangements of minerals called *Lineation or Foliation.***
- **Sometimes minerals of different groups are arranged into alternating thin and thick layers appearing in light and dark shades such structure is called *Banding***

ROCK CYCLE

- **Rock cycle is a continuous process through which old rocks are transformed in to new ones.**
  Rocks do not remain in their original form for long but may undergo transformation



Rock Cycle

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