



SNS COLLEGE OF TECHNOLOGY
(AN AUTONOMOUS INSTITUTION)
COIMBATORE-35

II YEAR / III SEMESTER
19CET201-ENGINEERING GEOLOGY



WEATHERING OF ROCKS

Weathering describes **the breaking down or dissolving of rocks and minerals on the surface of the Earth**. Water, ice, acids, salts, plants, animals, and changes in temperature are all agents of weathering. Once a rock has been broken down, a process called erosion transports the bits of rock and mineral away.





TYPES OF WEATHERING

- Physical weathering
- Chemical weathering
- Biological weathering





PHYSICAL WEATHERING

Physical weathering is caused by the effects of changing temperature on rocks, causing the rock to break apart. The process is sometimes assisted by water. There are two main types of physical weathering:

- ❖ Freeze-thaw occurs when water continually seeps into cracks, freezes and expands, eventually breaking the rock apart.
- ❖ Exfoliation occurs as cracks develop parallel to the land surface as a consequence of the reduction in pressure during uplift and erosion.





PHYSICAL WEATHERING

Where does it occur?

Physical weathering happens especially in places where there is little soil and few plants grow, such as in mountain regions and hot deserts.

How does it occur?

Either through repeated melting and freezing of water (mountains and tundra) or through expansion and contraction of the surface layer of rocks that are baked by the sun (hot deserts).





CHEMICAL WEATHERING

Chemical weathering is caused by rain water reacting with the mineral grains in rocks to form new minerals (clays) and soluble salts. These reactions occur particularly when the water is slightly acidic.





CHEMICAL WEATHERING

Where does it occur?

These chemical processes need water, and occur more rapidly at higher temperature, so warm, damp climates are best. Chemical weathering (especially hydrolysis and oxidation) is the first stage in the production of soils.

How does it occur?

There are different types of chemical weathering, the most important are:

Solution - removal of rock in solution by acidic rainwater. In particular, limestone is weathered by rainwater containing dissolved CO₂, (this process is sometimes called carbonation).

Hydrolysis - the breakdown of rock by acidic water to produce clay and soluble salts.

Oxidation - the breakdown of rock by oxygen and water, often giving iron-rich rocks a rusty-coloured weathered surface.



BIOLOGICAL WEATHERING

Living organisms contribute to the weathering process in many ways

Trees put down roots through joints or cracks in the rock in order to find moisture. As the tree grows, the roots gradually prize the rock apart.





BIOLOGICAL WEATHERING

Many animals, such as these Piddock shells, bore into rocks for protection either by scraping away the grains or secreting acid to dissolve the rock.





BIOLOGICAL WEATHERING

Even the tiniest bacteria, algae and lichens produce chemicals that help break down the rock on which they live, so they can get the nutrients they need.





1. Water has the power to split rocks because when it freezes, it
 - a. Contracts
 - b. Evaporates
 - c. Expand



C





IGNEOUS ROCKS - formed from melted rock deep inside the earth.





SEDIMENTARY ROCKS - formed from layers of sand, silt, dead plants, and animal skeletons.

**Glacial
Conglomerate**



Shale



**Shelly
Limestone**



**Banded
Iron**

Sandstone



Chalk



Anthracite





METAMORPHIC ROCKS -formed from other rocks that are changed by heat and pressure underground.

Slate



Schist



Gneiss



Sphalerite Ore Rock



Jadeite



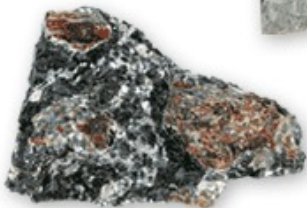
Deformed Conglomerate



Eclogite



Garnet Amphibolite



Marble





THANK YOU...