

Sedimentary Rocks

Sedimentary rocks are classified in three main groups: clastic, chemical, and organic.

Each group forms in a very unique way by completely different processes.

Clastic Rocks

The word Sedimentary comes from the Latin word sedimentum, which means settling. All of the clastic rocks are formed from broken bits and pieces of other existing rocks that settle out of water or air. The broken bits and pieces are called sediments and are caused by weathering.

Weathering

All rocks are subject to weathering. Weathering is anything that breaks the rocks into smaller pieces or sediments. This can happen by the forces of wind, rain, or moving and freezing water.

Deposition

The sediments that form from these actions are often carried to other places by the wind, running water and gravity. As these forces lose energy the sediments settle out of the air or water. As the settling takes place, the rock fragments are graded by size. The larger, heavier pieces settle out first. The smallest fragments travel farther and settle out last. This process of settling out is called deposition.



Erosion

The combination of weathering and movement of the resulting sediments is called erosion.

Lithification

Lithification is the changing of sediments into rock. There are two processes involved in this change. They are compaction and cementation.

Compaction occurs after the sediments have been deposited. The weight of the sediments squeezes the particles together. When more and more sediments are deposited on top, the weight on the sediments below increases. Waterborne sediments become so tightly squeezed together that most of the water is pushed out.

Cementation happens when dissolved minerals fill in the spaces between the sediment particles. These liquid minerals act as glue or cement to bind the sediments together.

Clastic sedimentary rocks are further organized according to the size of the sediment particles.

Chemical sedimentary Rocks

Chemical sedimentary rocks are not formed from sediments in the way that clastic sedimentary rocks are. Instead, they are formed from chemicals (elements) dissolved in water. Lakes, rivers, oceans, and ground water all have elemental chemicals dissolved in them.

There are three types of chemical sedimentary rocks:

- Evaporites
 1. Halite or rock salt
 2. Gypsum
 3. travertine
- Carbonates
 1. limestones
 2. dolostones
- Siliceous rocks
 1. chert

Evaporates

Evaporites form when bodies of water evaporate leaving behind deposits of one or more chemicals. Those white deposits on your sinks and faucets are the beginnings of this type of rock.

Another example of evaporate rocks can be found in your kitchen. Most table salt comes from Utah. The Great Salt Lake is the remnant of a vast inland sea that once covered much of the western United States. It is slowly shrinking in size due to evaporation. As the water evaporates the lake can no longer hold the same amount of salt. The salt precipitates out and is deposited as crystallized halite.

This is the basic process for all evaporates. As water evaporates, the remaining water becomes saturated with elements. The water can no longer hold the elements in solution and they crystallize into solid form.

The Carbonates

The carbonates are formed by chemical and biochemical processes. Limestones and dolostones are included in this group. They are made up primarily of two minerals, calcite CaCO_3 and dolomite $\text{CaMg}(\text{CO}_3)_2$

Siliceous rocks

The siliceous rocks are dominated by silica SiO_2 . Silica-secreting organisms like diatoms and radiolarians are responsible for the formation of this type of rock.

Organic sedimentary rocks

Organic sedimentary rocks are composed of organic matter in the form of plant fragments. We usually think of this group of rocks as coal.

- Lignite is black and has a crumbly consistency.
- Bituminous coal can be dull to shiny and black.

Rocks are the record, set in stone, of how the earth formed. The clues are all around you. You just need to learn the language and soon you'll be reading the pages of earth's history in the rocks that surround you... anywhere you go!