Clay Encyclopedia Article

Clay

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Clay is a fine-grained (small particle size) sedimentary **rock**. Clay is so fine-grained it is rarely possible to see the individual mineral particles with the naked eye. The definition of clays describes rocks with particle sizes of less than 4 µm in diameter. Most **sedimentary rocks** are described using both mineral content and particle size. While this is also true for clays, the particle size description is most reliable and most often used.

The majority of common types of **minerals** found in clays are kaolinite (a soapy-feeling and lightweight mineral), talc, pyrophyllite, all types of micas, minerals from the chlorite group, feldspars, and a lesser amount of **tectosilicates** (including **quartz**).

The mineral content of clays is less variable than other types of sedimentary rock. This is a direct result of the way clays are formed. **Water** carries the bulk of sediments to their resting place where they are cemented together. The transport of sediments is directly related to the force or velocity of water carrying them. The stronger the velocity of water, the larger and heavier the particle it can move. Conversely, the weaker the flow, the smaller the particle that is carried by the water. As a result, water acts as a winnowing filter for certain types of minerals. The heavier minerals are not carried as far by water currents as are the lighter ones. When water finally comes to rest, it deposits its load of minerals. The last to be released are the lighter and smaller particles, the clay minerals.

Where **rivers** meet **oceans**, the clay minerals are so light they are usually carried far out to sea where they fall gently to the bottom forming a fine-grained sediment. These deposits cover organic materials and trap them at the edges of deltas and continental slopes. Over millions of years, the organic materials convert to **petroleum** and remain trapped by the clays. This relationship makes the study of clays extremely important for petroleum geologists. In addition to this important economic consideration, clays provide important economic resources for a wide variety of other industries.

See Also

Petroleum Detection; Sedimentation