

Sandstones, Classification of Sandstones and description of the main types

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Sandstone is a clastic sedimentary rock composed mainly of sand-sized (0.0625 to 2 mm) mineral particles or rock fragments. It is a very widespread and well-known sedimentary rock, because sandstones make up 10-20% of all sedimentary rocks and sedimentary rocks are by far the most common rocks at the surface.

Most sandstone is composed of quartz or feldspar (both silicates) because they are the most resistant minerals to weathering processes at the Earth's surface. Like uncemented sand, sandstone may be any color due to impurities within the minerals, but the most common colors are tan, brown, yellow, red, grey, pink, white, and black. Since sandstone beds often form highly visible cliffs and other topographic features, certain colors of sandstone have been strongly identified with certain regions.

The Classification depends on the three main components of sandstones: quartz, feldspar and lithic fragments. There are micas, glauconite, hornblende etc. except for quartz and feldspar in sandstones. Accordingly, the name of sandstones depends on the composition.

Rock formations that are primarily composed of sandstone usually allow the percolation of water and other fluids and are porous enough to store large quantities, making them valuable aquifers and petroleum reservoirs.

In a sandstone, the mineralogical composition of framework grains can be considered a product of source rock composition, tectonism, weathering/transportation and diagenetic processes. Therefore, all framework grains in sandstone, provided they have not been too significantly altered transportation and diagenesis, can provide information about the composition and tectonism of the source areas; thus, the mineralogical composition of sandstone grains is key in the study of provenance. In turn, changes in the provenance of the sand grains can sometimes shed light on the tectonic history and timing in a region, especially in an area where the sediments are known to have been deposited simultaneously with active tectonic change.

Geologically, the sandstones are the most informative sedimentary rocks and therefore it is very important their thorough-study.