Any rock that has cooled and solidified from a molten state is an igneous rock,

Therefore, if the Earth began as a superheated sphere in space, all the rocks making up its crust may well have been igneous and thus the ancestors of all other rocks,

Even today, approximately 95 percent of the entire crust is igneous,

Periodically, molten material wells out of the Earth's interior to invade the surface layers or to flow onto the surface itself,

This material cools into a wide variety of igneous rocks,

In the molten state, it is called magma as it pushes into the crust and lava when it runs out onto the surface,

All magma consists basically of a variety of silicate minerals (high in siliconoxygen compounds), but the chemical composition of any given flow may differ radically from that of any other,

The resulting igneous rocks will reflect these differences, Igneous rocks also vary in texture as well as chemistry,

Granite, for instance, is a coarse-grained igneous rock whose individual mineral crystals have formed to a size easily seen by the naked eye,

A slow rate of cooling has allowed the crystals to reach this size,

Normally, slow cooling occurs when the crust is invaded by magma that remains buried well below the surface,

Granite may be found on the surface of the contemporary landscape, but from its coarse texture we know that it must have formed through slow cooling at a great depth and later been laid bare by erosion,

Igneous rocks with this coarse-grained texture that formed at depth are called plutonic,

On the other hand, if the same magma flows onto the surface and is quickly cooled by the atmosphere, the resulting rock will be fine-grained and appear quite different from granite, although the chemical composition will be identical,

This kind of rock is called rhyolite,

The most finely grained igneous rock is volcanic glass or obsidian, which has no crystals,

Some researchers believe this is because of rapid cooling; others believe it is because of a lack of water vapor and other gases in the lava,

The black obsidian cliffs of Yellowstone National Park are the result of a lava flow of basalt running head on into a glacier,

Some of the glacier melted on contact, but suddenly there also appeared a huge black mass of glassy stone,