

Origin of Zenous Kaolinite, E. Azarbayejan, Iran

Alipour, Samad, University of Urmia, Urmia, Iran.

Zenous kaolinite is best known for its plain white colour along with high free quartz content and therefore rich in silica.

Compared to the all other known Kaolinite mines in Iran, which all are formed in Permian–Triassic stratigraphic gap, Zenous is formed by insuite alteration of rhyo-dacitic tuffs of Eocene-Oligocene age. Geochemically it differs by a high free quartz impurity rising the silica over 75% and decreasing alumina to 15% compared to other Kaolinite mines of Iran, and other countries. That prevents this deposit to be used as a refractory clay and limits its usage before being washed and concentrated in the nearby factory.

The washing process in addition to rising unit price, also have produced millions of tons of unremovable waste quartz, susceptible to produce many environmental problems.

Microscopic and visual flow banding in thin sections indicate during movement crystallization and later alteration of feldspars to the kaolinite and minor montmorillonite. From geochemical, mineralogical and X-ray analysis of 200 samples two major minerals including kaolinite and quartz, and some minor minerals such as calcite, dolomite, montmorillonite and scarce mica are recognized. The whole composition is very similar to the widespread tuffs of the same age in Azarbayejan known as Karaj formation with more feldspar alteration.

As results, the whole reserve is an altered tuff or rhyolite-dacite type volcanic, thus it differs in age and stratigraphic position, geochemical and also usage from other kaolinites, so it is suggested this deposit to be categorized as kaolinised tuff rather than a kaolinite reserve.