Textural studies, introduction of ore types, and origin of the Triassic-Jurassic Siahrudbar bauxite deposit, southeast of Gorgan

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Abstract

The Siahrudbar bauxitic horizon is located in ~25 km southwest of Aliabad Katoul, Golestan Province, north of Iran. This deposit is stratiform and were developed along the boundary of the Elika and Shemshak formations. Petrographic observations along with the results of XRD analyses of the ore samples revealed that diaspore, hematite, and kaolinite are the major constituent minerals which are accompanied by lesser amounts of chamosite, anatase, boehmite, goethite, rutile, calcite, muscovite, clinochlore, and quartz. These minerals display various textures including pelitomorphic, granular, pseudo-porphyry, fluidal, pseudo-breccia, dumbbell-shaped grains, and clastic fragments, indicating allogenic origin. Based upon quantitative values of minerals, the Siahrudbar deposit consists of two types of ores, (1) the clayey bauxite and (2) the bauxitic clay. These ores were formed during deferrugenization and desilication processes from the clay minerals. The geochemical data of less mobile elements indicate that the Siahrudbar deposit is of karst bauxite type and generated from the weathering of igneous (basaltic-andesitic) rocks. Furthermore, the Eu anomaly values together with the ratios of TiO_2/Al_2O_3 and Sm/Nd revealed that the Siahrudbar bauxitic deposit was formed in a continental margin tectonic setting.

Keywords: Bauxite, Siahrudbar, mineralogy, authigenic origin, Eu anomaly, Weathering