Comparative study of mineralogy and geochemistry of altered felsic rocks in Yazd province

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Abstract: Altered quartz feldspathic rocks and associated soils with the felsic source rock crops out in different areas of the Yazd Province, and are used as ceramic, porcelain and glass raw materials. Alteration products in the igneous rocks of the Cambrian Rizo series (Zarrin and Tut), Precambrian metagranites (Saghand), post-Jurassic leucogranites (Khezrabad) and Neogene Dacites (Abdolah) were investigated and compared to each others for the intensity of alteration, textural variations, and mineralogy in the units. The major mineralogy of their alteration products includes quartz, feldspar, ilite, kaolinite, and montmorillonite. Chemical Index of Alteration (CIA), Chemical Index of Weathering (CIW), Index of compositional variety (ICV), and Plagioclase Index of Alteration (PIA) were determined for the alteration products. The indices values show a weak to moderate degree of alteration for Saghand metagranites, Khezrabad leucogranites, and Abdolah Dacites, and a moderate to strong degree of alteration for Rizo series. The observed differences have resulted from the lithologic type of the source rocks, age, climatic conditions as well as structural characteristics of the areas.

Keywords: Yazd Province; felsic rocks; clay mineralization; Chemical Index of Alteration (CIA); Chemical Index of Weathering (CIW); Index of compositional variety (ICV); Plagioclase Index of Alteration (PIA).

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