
Chemical Changes and Genesis of Secondary Minerals during the Alteration of Biotites from Ignimbrites in the Tazzeka Mountain (Morocco)

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Abstract: The Tazzeka Mountain, located approximately 20 km south of Taza, eastern Morocco, is composed of a Westphalian volcano-sedimentary complex. It contains rhyolitic ignimbrites with the following minerals: quartz, potassium feldspar, oligoclase-andesine, and biotite. The ignimbrites are extensively altered because of a dense network of fractures in the massif. Alteration has resulted in the formation of spheroidal rocks and saprolite, the thickness of which depends on local topography. The evolution of the biotites in the ignimbrites was investigated by microprobe analysis of the mica crystals. This technique provides data that are not accessible through classical analytical methods. Biotites are transformed into secondary clay minerals, mainly chlorites and illites; intermediate stages are related to the degree of alteration of biotite, the latter being expressed by the K₂O content which decreases progressively from 7.3 to 1.3%. Next come protochlorites and chlorites *sensu stricto*, in which the K₂O content is 0.3%. Several processes including retrodiagenesis, hydrothermal activity, fumarolic activity, and geochemical weathering contributed to the transformation of the biotites at Tazzeka.

Key Words: Alteration • Biotite • Chlorite • Ignimbrite • Illite • Structural Formula

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