Feldspar Weathering in Lateritic Saprolite

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Abstract: Feldspars in granitic saprolite in southwestern Australia have altered to halloysite, kaolinite, and gibbsite with no evidence of noncrystalline material. The secondary minerals are commonly present as intimate mixtures within altered feldspar grains, but discrete zones of gibbsite or halloysite-kaolinite also are present. Variations in the chemical microenvironment within micrometer-size zones in grains apparently controlled the type and distribution of secondary minerals. The alteration of both plagioclase and alkali feldspars involved congruent dissolution by soil solution and crystallization of halloysite, kaolinite, and gibbsite from this solution. Highly altered feldspar grains consist of etched feldspar fragments embedded within a highly porous framework of subhedral to euhedral platy crystals of kaolinite and gibbsite, or of spherical and felted aggregates of halloysite.

Key Words: Feldspar • Gibbsite • Halloysite • Kaolinite • Noncrystalline material • Weathering

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