
Vermicular Kaolinite Epitactic on Primary Phyllosilicates in the Weathering Profiles of Anorthosite

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Abstract: The microtextural changes in the kaolinization of primary phyllosilicates including biotite, sericite, clinocllore and muscovite were investigated by scanning electron microscopy (SEM) and microchemical analysis of thin sections of weathered anorthosite. Kaolinization began at grain edges and propagated toward the interior. Grains were highly fanned out from the edges and exfoliated into several flakes along the basal cleavages, producing lenticular voids. Finally, long vermicular kaolinite pseudomorphs were formed after primary phyllosilicates. Statistical analysis showed a ninefold increase in volume during the kaolinization of biotite, suggesting that most AI in the kaolinite was imported from ambient weathering solution. Weathering primary phyllosilicates supplied templates suitable for the thick epitactic overgrowth of kaolinite to form long vermicular pseudomorphs. AI was sufficiently available due to the intense weathering of soluble anorthosite. Although present in small amounts, primary phyllosilicates gave high volumetric and mineralogical contributions to the weathering profiles by facilitating kaolinite precipitation.

Key Words: Epitactic • Kaolinite • Pseudomorph • Scanning Electron Microscopy • Weathering

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