
Clay Mineral Formation in an Alpine Environment

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Abstract: Vermiculite, mixed-layer vermiculite-phlogopite, and smectite are presently forming from igneous and metamorphic bedrock in the alpine zone of the northern Cascades, Washington. In addition, south-facing exposures of quartz-diorites and metadiorites above snow line are weathering to ferruginous bauxite. Calculations indicate that vermiculite is presently forming from phlogopite schists in this environment at a unit area rate that is approximately six times the average estimated rate of clay erosion for North America. The mineralogical data indicate that chemical weathering in this region is a quantitatively significant process, and suggest that in the development of current geomorphic concepts researchers may have generally underestimated the importance of chemical weathering in alpine environments.

Clays and Clay Minerals; December 1971 v. 19; no. 6; p. 361-374; DOI: [10.1346/CCMN.1971.0190604](https://doi.org/10.1346/CCMN.1971.0190604)

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