

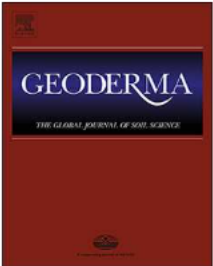
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Halloysite-smectite mixed-layered clay in fluvio-volcanic soils at the southern foot of Mount Kilimanjaro, Tanzania



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ABSTRACT

The formation of kaolinite-smectite mixed-layered clays results from weathering of smectite in leached and silica-depleted environments. Halloysite-smectite mixed-layered clays have been proposed to form from weatherable minerals in volcanic ash soils through simultaneous formation of 1:1 and 2:1 units in silica-rich environments. Here, we report a mineralogical study of weathered B horizon material from soils developed on Late Quaternary fluvio-volcanic deposits of basaltic origin at the southern foot of Mount Kilimanjaro in northern Tanzania. This area is characterized by a strong seasonality: two months of highly humid conditions followed by a 10-month pronounced dry season during which mineral authigenesis takes place. The weak leaching conditions are reflected in the high base saturation of the soils and by their high content of amorphous silica. The soils contain no allophane. The clay fractions contain dioctahedral 1:1 layer silicates, trioctahedral mica, gibbsite and feldspar, as well as a substantial amount of 1:1/2:1 mixed-layered clays with predominance of 1:1 layers. The latter consist of dehydrated halloysite that only partially expands after formamide intercalation, because of its