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# Intergradient Vermiculite-Kaolin Mineral in a Korean Ultisol

Koji Wada and Yasuko Kakuto

Faculty of Agriculture, Kyushu University 46, Fukuoka 812, Japan

**Abstract:** A 14-Å mineral coexisting with kaolin minerals, mica, and gibbsite in a Korean Ultisol and showing X-ray powder diffraction features of "chloritized" vermiculite was studied by a combination of methods. The 14-Å mineral collapsed on saturation with K<sup>+</sup> after extraction with hot 1/3 M sodium citrate, but the Si/Al ratio of the extracted material was close to 1.0 and kaolin minerals dissolved, as indicated by difference infrared spectroscopy. The 14-Å mineral was also collapsed by heating at or above 350° C. The difference infrared spectra and the X-ray powder diffraction patterns indicated that two forms of kaolin mineral are present that differ in thermal stability; one decomposed by heating at or below 375° C and the other by heating above 375° C. The former kaolin mineral is probably associated with vermiculite and the latter is present as a discrete form. The 14-Å mineral was inferred to be an intergradient vermiculite-kaolin mineral, in which most vermiculite layers each partially transform into double kaolin layers, and to represent an intermediate phase during the transformation of 2:1 to 1:1 layer silicates in acid soils.

**Key Words:** Chlorite • Difference infrared spectroscopy • Intergradient • Kaolin • Ultisol • Vermiculite

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