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# Reduction and Oxidation of Fe<sup>3+</sup> in Dioctahedral Smectites—III.\* Oxidation of Octahedral Iron in Montmorillonite

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**Abstract:** Structural Fe<sup>2+</sup> in montmorillonite is readily oxidized by contact with water, salt solutions or on mild heating. This is shown clearly by the Mössbauer spectra and is associated with a sharpening of the infrared absorption near 880 cm<sup>-1</sup>. It was inferred that this band comprises the Fe<sup>2+</sup>—OH—Al and Fe<sup>3+</sup>—OH—Al deformations. The rate at which oxidation occurs depends on the exchangeable cations. High acidity of the interlayers is conducive to oxidation, as is contact with Cu<sup>2+</sup>-containing solutions or concentrated H<sub>2</sub>O<sub>2</sub> solutions.

The results show clearly that any chemical treatment of montmorillonite causes changes in the oxidation state of structural iron.

**Key Words:** Exchange • Iron • Oxidation • Reduction

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