
Structural Studies of Nontronites with Different Iron Contents by ^{57}Fe Mössbauer Spectroscopy

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Abstract: The ^{57}Fe Mössbauer spectra of a series of untreated and Ca-saturated nontronites showed a predominant Fe^{3+} resonance which was computer-fitted with two Fe^{3+} doublets defining iron in non-equivalent cis- $\text{FeO}_4(\text{OH})_2$ octahedral sites. In most spectra a doublet indicating tetrahedral Fe^{3+} was fitted and in one untreated sample a doublet indicating interlayer Fe^{3+} was identified. In a further untreated sample the interlayer iron was present as Fe^{2+} . Upon Ca-saturation the interlayer iron was displaced. It also appears that the interlayer iron was present in at least two different interlayer sites. From the computer-fitted data it was clear that the interlayer cations have a significant effect on the Mössbauer resonances of iron in the two non-equivalent cis-octahedral and the tetrahedral sites of nontronite.

Key Words: Interlayer cation • Iron • Mössbauer spectroscopy • Nontronite • Structural sites

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