The Orientation and Interaction of Ethylenediamine Copper (II) with Montmorillonite

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Abstract: The *d*(001) spacings for a series of montmorillonite samples containing increasing amounts of $Cu(en)_3^{2+}$ were recorded after exposure to 50% humidity, 10% humidity, and air that had been saturated with ethylene glycol. It was found that $Cu(en)_3^{2+}$ is too large to fit between the montmorillonite particles and that in those samples with large amounts of ethylenediamine Cu(II) added, the clay platelets are associated with stronger interactions than those with small amounts of Cu (II) complex added.

Infrared spectroscopy and electron spin resonance analysis indicate that the absorbed copper (II) complex is the square planar *bis* ethylenediamine Cu(II) and that the complex ion is oriented so that the d_{z^2} orbital is perpendicular to the clay surface. The montmorillonite particles may act as ligands and coordinate with $Cu(en)_2^{2+}$ ions.

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