Role of Ferric Iron in the Oxidation of Hydrocortisone by Sepiolite and Palygorskite

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Abstract: The role of adsorbed and structural Fe^{3+} in palygorskite and sepiolite with respect to the oxidation of hydrocortisone in aqueous suspension has been evaluated using electron spin resonance and UV-visible spectroscopy. Natural surface-adsorbed Fe^{3+} showed an important activity in the oxidation process, although smaller than octahedral Fe^{3+}. The kinetics of oxidative degradation of hydrocortisone by palygorskite appear to be composed of two apparent first order reactions which may be associated with two kinds of sites for Fe in palygorskite. The lower oxidizing power of sepiolite for hydrocortisone degradation is due to its very low Fe^{3+} content.

Key Words: Catalysis • Electron spin resonance • Hydrocortisone • Iron • Oxidation • Palygorskite • Sepiolite

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