Electron Spin Resonance Studies of Iron Oxides Associated with the Surface of Kaolins

B. R. Angel and W. E. J. Vincent

Department of Mathematical Sciences, Plymouth Polytechnic Plymouth, Devon, England

Abstract: The different types of iron oxide phases associated with the surfaces of two suites of kaolins from Georgia, U.S.A., and from the Southwest Peninsula of England, have been identified using electron spin resonance (ESR) spectroscopy combined with magnetic-filtration, thermal, and chemical treatments. It has been shown that the English kaolins are coated with a lepidocrocitelike phase, which is readily removed by de Endredy's method of deferrification, while the Georgia kaolins are coated with a hematite- or goethitelike phase, which is not removed by this treatment. Throughout the course of this study, the effects of the various physical and chemical treatments on the brightness values of the kaolins were examined.

Key Words: Goethite • Hematite • Iron • Kaolin • Lepidocrocite

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