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Spectroscopic study of thioindigo-mineral composite[1] WILLIAM DURRER, FELICIA MANCIU, Physics Department, ALEJANDRA RAMIREZ, Materials Research and Technology Institute, JAYESH GOVANI, Physics Department, RUSSELL CHIANELLI, Materials Research and Technology Institute, The University of Texas at El Paso, El Paso, Texas 79968 — We report in this study structural changes taking place for the thioindigo-clay mixture in forming a pigment similar to Maya Blue. Different proportions of dye concentrations relative to that of the mineral, as well as different heating times, were applied in pigment synthesis and the outcomes were investigated using FT-IR and FT-Raman spectroscopy. For the pigment samples, the FT-IR peaks at 1627 cm^{-1} are attributed to a downshifted C=O stretching mode of thioindigo due to dye-clay interaction. This interpretation is corroborated by FT-Raman C=O peaks with 14 cm^{-1} shifts to lower frequency for the pigment relative to thioindigo alone. Additional Raman scattering between 550 cm^{-1} and 650 cm^{-1} also suggests dye-clay interaction through metal-oxygen bonding. We thus consider the possibility of hydrogen bonding between silanol and carbonyl dominating at lower dye concentration, with mostly metal-oxygen bonding at higher dye concentration.

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