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Spectroscopic Studies of Azul Maya: Novel Organic/Inorganic Complexes LAYRA REZA, FELICIA MANCIU, University of Texas at El Paso, Physics Department, BRENDA TORRES, LORI POLETTE, RUSSELL CHIANELLI, University of Texas at El Paso, Materials Research & Technology Institute, UTEP TEAM — Maya pigments are novel organic/inorganic hybrid materials with multiple technological applications. The materials are surface compounds formed by heating an organic molecule such as indigo with an inorganic compound such as palygorskite, which is a common clay. The organic molecule upon heating forms a strong interaction with the clay surface stabilizing both entities. This strong interaction is exhibited through a color change from deep blue to the well-known Maya Blue indicating an exchange of electron density at the surface. Analysis by infrared absorption and Raman spectroscopy demonstrate the disappearance of nitrogen-hydrogen (N-H) bonding, as the indigo molecule incorporates into the inorganic palygorskite material. Infrared data confirm the loss of zeolitic water and a partial removal of structural water after the heating process. Carbon and oxygen studies at Stanford Synchrotron Radiation Laboratory by X-Ray photoemission spectroscopy (XPS) and near-edge X-ray absorption fine structure (NEXAFS), respectively, suggest possible cationic (Al^{+3}) bonding of the organic molecule to palygorskite compound.

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