

Analyses of Pigments from Japanese 17th Century Sugito Door Paintings

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Painted *sugito* are large cedar sliding doors that were typically found in the houses of the wealthy and powerful, most are considered national treasures of Japan. The Philadelphia Museum of Art (PMA) has a large collection of 20 *sugito* each having artistic displays of nature, notable people, and gods. The objective of the study was to identify the artists' materials used in the painted decorations, with a long term goal of preservation. Initial studies by PMA scientists found that there was visible deterioration in some of the green pigment regions of the doors. Small samples, 1-8 mg, of green pigment were acquired from several doors and the ICDD analyzed these pigments by X-ray powder diffraction.

Malachite was identified in all of the green samples by diffraction analyses. Darker green hues contained tenorite or carbon, while lighter greens contain brochantite. Philipsburgite, a copper zinc arsenate, was identified in three specimens, as well as Zn-doping in the malachite. The Philipsburgite has previously been associated with the old Yamato mine in Japan.