

ANALYSES OF GREEN 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 confirmed that some areas of the doors were covered by soluble nylon in a prior conservation effort. They also found that there was visible deterioration in some of the green pigment regions of the doors. Also, malachite particles are adhered to the nylon. 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 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. This mineral has previously been associated with the old Yamato mine in Japan.