


Object Number	K270-1-4	Description	Eye-shaped mount in gold with garnet cloisonné decoration. Catalogue no. 542.
		Sample Description and location. Sample K270-1-4 collected from within left hand corner of lower lentil shaped cell.	



Figure 1. Sample collection point for K270-1.



Figure 2. Detail of sample collection point for K270-1.

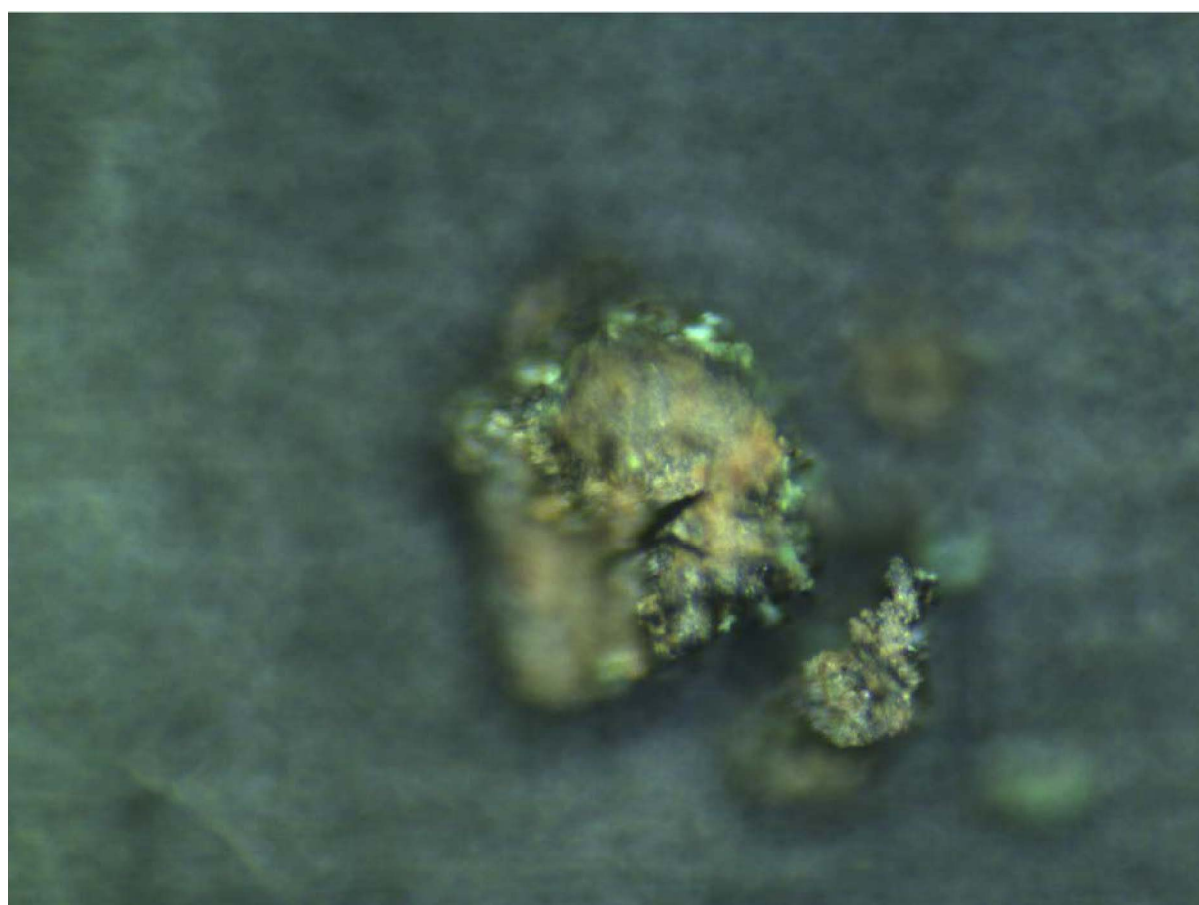


Figure 3. Detail of FTIR analysis sub sample K270-1-4.

FTIR Analysis

Comments: Sample K270-1-4 (top, red spectrum) appears to be a combination of malachite $\text{Cu}_2\text{CO}_3(\text{OH})_2$ (middle, green) and alumina silicate material which forms a major component of many clay minerals (bottom blue). Malachite is a hydrated carbonate, and as such has a broad absorption band due to O-H stretching between 3700 and 3100 cm^{-1} that incorporates peaks at 3400 and 3320 cm^{-1} (Derrick et al 1999). Additional peaks relating to O-H bending are found between 1100 and 1000 cm^{-1} . The split peak between 1530 cm^{-1} and 1350 cm^{-1} relates to C-O stretching, and a complex series of peaks between 900 and 650 cm^{-1} arise from O-C-O bending vibrations from the hydrated carbonate ion (Derrick et al. 1999). Generally speaking, silicates are characterized by a region of strong absorption near 1000 cm^{-1} due to Si-O stretching, and a second region of absorption near 500 cm^{-1} arising from Si-O bending, often in combination with other cation-oxygen vibrations (Djomgoue & Njopwouo 2013).

Representative Spectrum

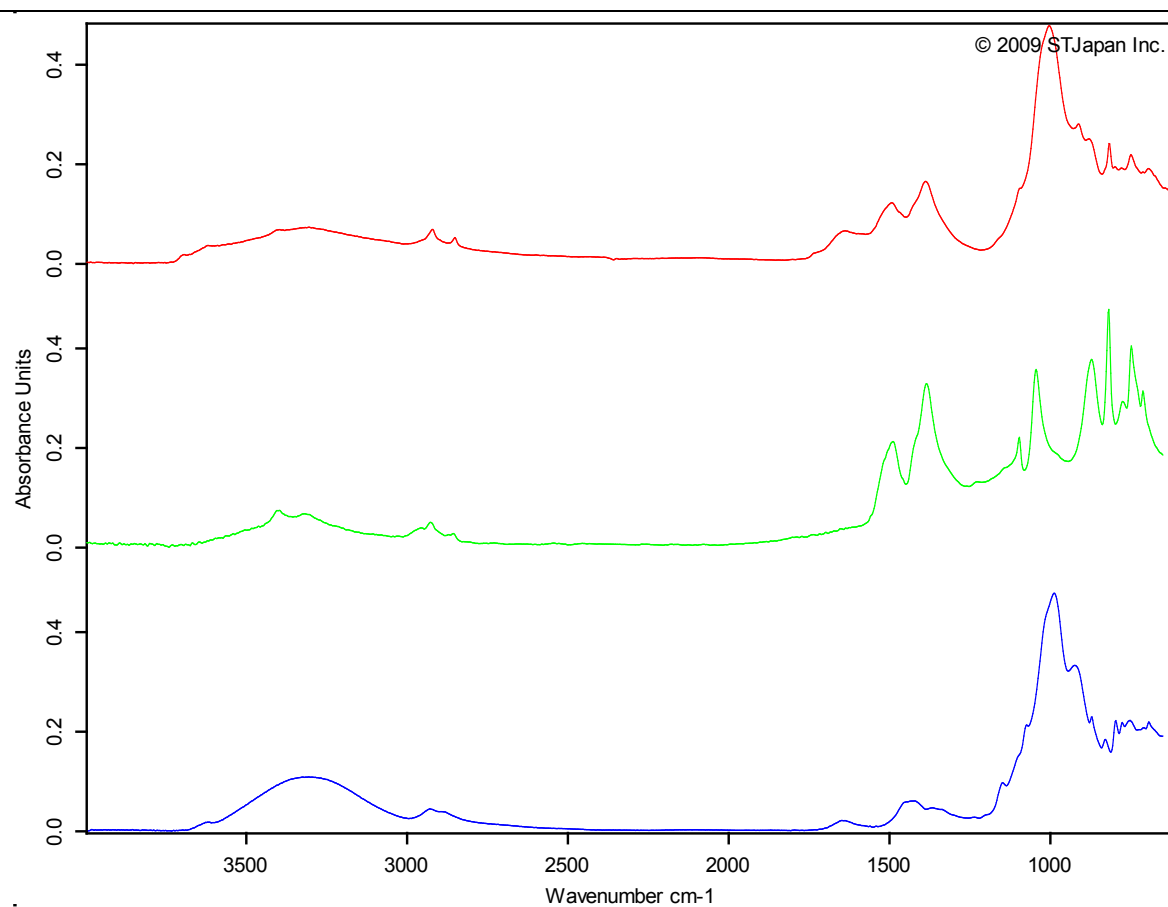


Figure 3: Top (red): K270-1-4. Middle (green) Japanese Malchite Pigment reference, ST Japan 2009, Bottom (blue) Alumino silicate reference spectrum, ST Japan 2009.

