Protocol for Sampling Individual Lacquer Layers

Sampling for analysis by TMAH-Py-GC/MS is done by scraping with a scalpel or a custom-made micro-chisel. In general, an area approximately 2 mm x 2 mm is selected for sampling and excavated layer-by-layer, collecting the scrapings from each stratum separately. This area yields sufficient sample material for TMAH-Py-GC/MS analysis on individual layers as thin as 20 µm; the area can be reduced proportionately for thicker layers. The work of excavation is conducted at moderate- to high-magnification under a stereomicroscope using both visible and UV illumination. The use of a high-intensity UV spotlight, such as the Labino TrAc Light UV, is extremely useful in differentiating the layers as they are sampled. The previously prepared cross section photomicrographs are regularly consulted as sampling progresses to aid in the identification of each layer. Before sampling any given layer, all overlying material is removed with the excavating tool. Then, scrapings of the target layer are carefully extracted and placed in the well of a single-depression microscope slide. Collection of sample material is halted when the next, underlying layer begins to be exposed, because it poses a risk of interlayer contamination. All remnants of the sampled layer are then scraped away and discarded so that sampling of the next layer can begin. Layers greater than 20 µm in thickness can usually be sampled discretely with little or no contamination from adjacent layers. For sample locations beneath gilded mounts, microcracking of the lacquer and subsequent contamination by restoration coatings is generally not encountered because the areas sampled are well protected from light. Finally, for layers less than 20 µm in thickness, adjacent layers may prove to be indistinguishable even under UV light. In these cases, multiple layers are sometimes knowingly sampled together.

Protocol developed for Characterization of Asian and European Lacquers, a project of the Getty Conservation Institute, Los Angeles.