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Material Analysis for Temple Painting Conservation in Taiwan

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Abstract : For traditional painting materials, the artisan used to combine the pigments with different binders to create colors. As time goes by, the materials used for painting evolved from natural to chemical materials. The vast variety of ingredients used in chemical materials has complicated restoration work; it makes conservation work more difficult. Conservation work also becomes harder when the materials cannot be easily identified; therefore, it is essential that we take a more scientific approach to assist in conservation work. Paintings materials are high molecular weight polymer, and their analysis is very complicated as well other contamination such as smoke and dirt can also interfere with the analysis of the material. The current methods of composition analysis of painting materials include Fourier transform infrared spectroscopy (FT-IR), mass spectrometer, Raman spectroscopy, X-ray diffraction spectroscopy (XRD), each of which has its own limitation. In this study, FT-IR was used to analyze the components of the paint coating. We have taken the most commonly seen materials as samples and deteriorated it. The aged information was then used for the database to exam the temple painting materials. By observing the FT-IR changes over time, we can tell all of the painting materials will be deteriorated by the UV light, but only the speed of its degradation had some difference. From the deterioration experiment, the acrylic resin resists better than the others. After collecting the painting materials aging information on FT-IR, we performed some test on the paintings on the temples. It was found that most of the artisan used tune-oil for painting materials, and some other paintings used chemical materials. This method is now working successfully on identifying the painting materials. However, the method is destructive and high cost. In the future, we will work on the how to know the painting materials more efficiently.

Keywords : temple painting, painting material, conservation, FT-IR
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