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Type: **Talk**

In situ investigation of synchrotron radiation damage effect of ancient paintings by time resolved ED-XAS and IR combined techniques

Tuesday, November 21, 2023 12:40 PM (25 minutes)

This talk focuses on the urgent problems of synchrotron radiation damage to ancient paintings. By the combined time resolved techniques of synchrotron radiation IR and ED-XAS in D-Line at SSRF, in situ radiation damage effect of paintings has been investigated. Results show that organic binders are easy to be damaged, especially when mixed with inorganic mineral pigments. And if the incident X-ray energy is near the absorption edge of major element in the pigments, the damage effect will be more serious. X-ray radiation damage effect will be more obvious from the point of view of protein structures, especially from their secondary structures. This research indicates that, in analysis of ancient paintings by synchrotron radiation X-ray methods, radiation damage can be effectively reduced by using X-ray energy far away from the absorption edge of major element in pigments, or using time resolved techniques. These results have important reference value for how to reduce the radiation damage effect of cultural relic painting in synchrotron radiation X-ray analysis.

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