EDXRF studies on Chinese ancient ceramics: A Comparison of Bench-top XRF, HH-XRF, and Micro-XRF

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Abstract: Compared with other elemental analysis techniques, energy-dispersive X-ray fluorescence (EDXRF) is more suitable as a non-destructive method for precious museum objects. Since the 1990s, Shanghai Museum has carried out a number of projects involving the analysis of Chinese ancient ceramics. Firstly, the suitable measuring parameters of EDXRF were set up according to the characteristic chemical compositions of Chinese ancient ceramics from different periods. Secondly, two matrix correction techniques were selected to reduce the analytical error, as well as to enable accurate results from small samples and/or samples with curved surface. Thirdly, the influences of the thickness or uniformity of glaze on the result of analysis were discussed. Finally, the measurement stability and repeatability of the instrument were examined for establishing the chemical composition database of Chinese ancient ceramics. These research achievements have gradually been applied in determining the authenticity, distinguishing the provenance and age, and studying the manufacture technique of ancient ceramics. Newest research is focused on the applicability of Hand Held (HH XRF) and Portable (pXRF) units on the same materials previously analyzed by Bench-top methods.