The Development of TXRF Method and its Application on the Study of Trace Elements in Water at SSRF
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Abstract: The objective of this study is the development of Total Reflection X-ray Fluorescence (TXRF) method at Shanghai Synchrotron Radiation Facility (SSRF). In this paper, the SR-TXRF setup, the related experimental methods and the results for the determination of trace elements in water were described. Compared with the conventional lab TXRF, the detection limits obtained in our experiment are very lower due to the advantages of synchrotron radiation, which varied from 1.11 pg (Cr) to 0.28 pg (Zn). The average deviation of the specimen replicates is below 5%, and the deviations of measured element concentrations for Cr, Mn, Co, Ni and Cu by SR-TXRF are within 10% compared with the values by ICP-MS, so these TXRF results are agreed with those obtained by ICP-MS for the detected metals. Based on the results, the SR-TXRF setup and method have been feasible for the quantitative analysis of multi-elements in water at SSRF and that will play an important role in the research area for the environmental samples analysis.