

THE ATTEMPT OF ULTRA SENSITIVE X-RAY FLUORESCENCE SPECTROMETRY USING THE MULTI EXCITATION X-RAY TUBE

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The X-ray fluorescence spectrometry (XRF) is endeavored various improvements of detection limit, for example, increasing of X-ray intensity and using of monochromatic X-rays et al. The excitation efficiency of fluorescence X-rays depends on the kind of the excitation source. So the multi excitation sources are required in the XRF for the improvement of the detection limit. In this work, the table-top-type XRF spectrometer with multi excitation sources is developed.

The present equipment has the multi excitation sources X-ray tube that has 3 kinds of the metals as the target. The target metals can select from the controller. Cr, W, and Ag are selected as the target metals. This X-ray tube can measure wide range elements effectively. The monochromatic exciting source for the improvement of the detection limit, and the double toroidal type crystal for the collection with higher effectively are used in this study. The Ag-K α line is monochromized by the LiF (200). The W-L β line is monochromized by the HOPG (0002). The Ag-L α and the Cr-K α lines are irradiated the sample directly through the single capillary. The fluorescence X-rays are detected by the Silicon Drift Detector (SDD). The present equipment is reduced size and weight.

The present equipment can measure almost elements with higher effectively because of using the multi excitation sources. It is expected that the quantitative analysis by the X-ray fluorescence becomes possible more higher effectively. It is possible for the present XRF spectrometer to be used in various industrial fields.

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