OBSERVATION OF CRYSTAL STRUCTURE CHANGES WITH FULL FIELD X-RAY DIFFRACTION IMAGING INSTRUMENT

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X-ray fluorescence analysis (XRF) and X-ray diffraction (XRD) are well known as the nondestructive analytical technique. XRF can provide the elemental information of the sample, furthermore XRD can obtain the crystal structure information. Recently, both imaging methods has been developed. The spatial resolution of μ-XRF and XRD imaging methods using X-ray focusing optics with synchrotron radiation is nm size[1][2]. Then we have studied full-field XRF (FFXRF) imaging using a straight polycapillary optics[3] and Soller slits. However, full-field XRD (FFXRD) imaging method have not been established.

Preliminary experiment of FFXRD using a polycapillary half lens and a straight polycapillary was performed[4]. The intensity of incident X-rays was insufficient, and the clear XRD images could not be obtained. Recently, We developed FFXRD imaging apparatus using a straight polycapillary with 9 kW X-ray tube. Then the process of crystal structure changes was successfully observed by combining the heating system.

References

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