

IP Slant-incidence Correction for Accurate Structure Factor Measurements

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Slant incident X-rays on IP give higher intensity than normal incident ones. The correction for the effect was first proposed by considering incomplete absorption of X-rays in the phosphor layer of IP[1]. We proposed a correction factor $\cos \theta$ taking into account the absorption of emitted luminescence by the phosphor layer[2]. However they are not good enough at higher slant angles. This inhibits us to develop highly accurate IP devices, although IP has very high potential for accurate structure factor measurements.

The $\cos \theta$ formalism was improved by carefully evaluating the accessible area of emitted light by the optical system of the IP readout system, BAS2500(Fuji Film) and applied it to 4f-electron density measurement of CeB₆ by VCIP method. The ratio of the difference of observed and calculated intensities to calculated one were plotted against θ for all the observed reflections, exhibiting excellent coincidence over the observed θ range from 0 to 55°. Actually R factors without correction, with correction employing $\cos \theta$ formalism and using the new method were 4.5, 2.9 and 1.9%, respectively. 4f-electron deformation density in CeB₆ appeared only after the new correction, which is similar to the one by four-circle diffractometer[3]. The method can be easily extended to the other IP readout systems.

[1] Zaleski J., Coppens P., *J. Appl. Cryst.*, 1998, **31**, 302. [2] Zhurova E. A., Zhurov V.V., Tanaka K., *Acta Cryst.* 1999, **B55**, 917. [3] Tanaka K., Onuki Y., *Acta Cryst.*, **B58**, 423.

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