Relation of Local and Integral Intensities of Reflections on Oblique Texture Electron Diffraction (OTED) Pattern

Max Nickolsky, *Institute of Ore Deposits (IGEM) RAS, Moscow, Russia.* E-mail: sir_Maxus@mail.ru

OTED patterns arise from samples with preferred orientation of crystals. Reflections on OTED patterns from plate-like crystals appear as arcs. Structure amplitude could be determined either from integral intensity of reflection (integration of intensity of hole arc) or from local intensity of reflection (integration of intensity along radial profile of arc). Equations of intensity of reflections on OTED patterns were derived by Vainstein [1].

Local intensity is given in [1] as: $I_{hkl}'=I_{hkl}\frac{\Delta}{r\alpha}$ (1), where I_{hkl}' and I_{hkl} - local and integral intensity of reflection, respectively, rα– azimuthal length of reflection, Δ- width of profile.

New registration systems (Imaging Plate, CCD), suitable for electron diffraction, allow investigation of shape of reflections on OTED patterns in much more detailed way than ever. As can be seeing directly, distribution of intensity in azimuthal direction of arc is not uniform and thus, equation (1) is not correct.

Precise determination of structure amplitude could be done with the respect to the shape of arc in azimuthal direction. The last depends on deviation of sample from ideal “texture” and could not be predicted in advance. The only way is to describe shape of reflections with analytical functions for each particular sample, assuming that shape of reflection is one and the same for all reflections on OTED pattern.

[1] Vainstein B. K., *Kristallografiya*, 1957, **2**, 340.

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