The doping method in quantitative X-ray diffraction phase analysis, developed by Popović and Grčeta-Plenković and Grčeta-Plenković and Balic-Zunic (J. Appl. Cryst. (1983) 16, 505-507), requires doping of the investigated multicomponent system by known amounts of the components, the weight fractions of which are to be determined. A variation of the doping method is proposed in the present contribution. It involves the addition to the investigated system of known amounts of a crystalline substance, X, not contained in the system. One determines the added amount of X, for which the intensity of the strongest diffraction line of a particular component falls below a small detectable value. This enables the determination (estimation) of the weight fraction of that component in the original system. Also, the discussion on the applicability of the method is given.


The intensities of several reflections measured by an ordinary powder diffractometer contain a lot of information about the orientation distribution of the crystals in the specimen. This information can be extracted by representing the orientation distribution function in terms of site-symmetrised spherical harmonics and by fitting the expansion with the measured intensity data.

However, the use of a specimen spinner is necessary in order to smoothen the distribution function and to introduce cylindrical symmetry. This reduces the sufficient number of texture parameters to 2 or 3.

As an example, the determination of Al₂O₃-concentration in an industrial alumina powder is presented. The biggest correction was 52 % the agreement between aluminia and standard corundum intensities being 8 %.