Contribution ID : **56** Type : **Poster**

Structural study of gypsum crystals at Naica by two-dimensional diffraction at Stanford Synchrotron.

Thursday, 13 August 2015 17:30 (1:00)

Abstract content

Naica Mine is located 112 km southeast of the capital of Chihuahua, Mexico. The gypsum crystals of Naica are the most striking and motivating worldwide. This paper presents the use of synchrotron radiation for the structural study of gypsum crystals. The experiments were performed at the Stanford Synchrotron Radiation Lightsource (SSRL). X-ray diffraction was used in reflection geometry with grazing incidence angle (GIXRD) and supported by X-ray transmission (TXR), both at beamline 11-3. Spectra processing was carried out by simulation with ANAELU [1, 2] program. 2D diffraction patterns obtained by GIXRD show a mosaic structure in the gypsum crystals. 2D diffraction patterns, obtained by TXR (Figure 1), show that gypsum has single crystal structure, and it is modified to a polycrystalline structure when approaching the impurities. Several phases were identified; however, the main one is hematite.

[1] L. Fuentes-Montero et al., Journal of Applied Crystallography, 44, 241-246. (2011) [2] ANAELU software: http://cimav.edu.mx/investigacion/software/anaelu (2010)

Summary

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Session Classification : Posters II