

**CHARACTERIZATION OF X-RAY POWDER DIFFRACTION DATA OF  
 $Ba_xSr_{1-x}SO_4$  ( $0 \leq x \leq 1$ ) BY RIETVELD REFINEMENT**

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X-ray powder diffraction (XRD) is an indispensable tool and widely used in research and development applications for materials characterization such as phase identification and quantification, crystallite size, residual stress analysis, crystal structure refinement and crystallographic preferred orientation [Sitepu. (2008). *Powder Diffraction*, **23**, 35-40] of crystalline materials. In this paper, characterization of XRD data of barium sulfate (barite) and strontium sulfate (celestite), which are important inorganic chemical products and have been widely used as significant industrial raw materials in oil and gas industry, as well as the family members of  $Ba_xSr_{1-x}SO_4$  ( $0 \leq x \leq 1$ ;  $\Delta x = 0.1$ ) solid solution will be described. The results include the (i) quantitative phase analysis of mixtures of barium sulfate and strontium sulfate with GSAS Rietveld refinement program; (ii) the mass percentage (wt%) of barium and strontium in  $Ba_xSr_{1-x}SO_4$  solution products with various x values of 0.1-0.9; and (iii) lattice parameters a, b and c of  $Ba_xSr_{1-x}SO_4$  solid solution crystals as a function of x value from 0 to 1 with a step size 0.1 according to the XRD data of characteristic peaks.