

A NOVEL SAMPLE PRESSING TECHNIQUE TO REDUCE PREFERRED ORIENTATION USING THE BACK-PRESSED PRESENTATION METHOD

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ABSTRACT

Sample presentation is a key aspect in order to obtain a representative powder x-ray diffraction pattern when using reflection geometry such as Bragg-Brentano. In Bragg-Brentano geometry the avoidance of preferred orientation, sample displacement and surface roughness would be goals of any sample presentation technique.

A mixture of 90 wt% gypsum and 10 wt% corundum was prepared by micronising in a McCrone mill. Sufficient of the mixture was prepared to enable more than 15 presentations on the prepared sample using an automatic sample loader for the diffractometer. The specimens were back-pressed with and without a 38 μ m nylon sieve mesh on the front face.

For gypsum/quartz mixture, the sieve mesh upon removal appears to leave a presentation surface that is preferable to that produced by back-pressing without the mesh.

The diffraction patterns for the sets of 15 presentations were modelled with TOPAS to determine the stability of parameters such as preferred orientation, specimen displacement, scale factors and weighted r factor.