

## **A SIMPLE METHOD FOR MAKING RANDOM AGGREGATES OF CLAY-BEARING MINERALS FOR X-RAY POWDER DIFFRACTION ANALYSIS**

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X-ray powder diffraction literature is replete with techniques to reduce or eliminate preferred orientation of samples analyzed in reflection mode. For clay-bearing mineral samples, making a random aggregate is especially difficult due to the variety of anisotropic crystal habits of common clay minerals. Methods, such as back-filling and side-drifting are commonly used to reduce preferred orientation. Both methods are highly operator-dependent and in clay-bearing mineral assemblages, the degree of preferred orientation most often determines the accuracy of quantification especially when using non-Rietveld methods. The most successful method for eliminating preferred orientation uses a spray-drying technique to produce spherical aggregates. The method requires a substantial investment in a spray drier and a fairly large sample size.

This article describes a simple technique that could be used to eliminate preferred orientation in clay-bearing mineral samples with sample preparation tools commonly found in a powder X-ray diffraction laboratory. The technique essentially uses a small sieve to produce spherical aggregates that could be loaded directly on a sample holder for diffractometers with vertical goniometer. Microstructural and diffraction data of aggregates produced by this method are compared to the traditional techniques for making random powder mounts.