

## **THE STUDY OF MICRONIZATION INDUCED DISORDER AND ENVIRONMENTAL ANNEALING OF AN ACTIVE PHARMACEUTICAL INGREDIENT (API) BY XRPD LINE BROADENING ANALYSES**

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Micronization of API's is often achieved through air jet milling. Air jet milling is a high energy process whereby fast moving API particles are forced to collide resulting in particle size reduction. Significant attrition is achieved through this process, but significant structural and surface changes are often also induced. In the following we describe the utility of using XRPD line broadening analyses on an API to gain insight into the impact of micronization on crystallite structure. The approach allows a gauge of the degradation of crystallite structure resulting from the micronization process. Additionally, experiments which stress the material under various conditions were conducted, and samples were also monitored for line width. These experiments show a distinct annealing process as indicated by the *reduction* of XRPD line width. The annealing is accelerated by temperature and water vapour. This result is indicative that adsorbed vapour may have access to the grain boundary structure of particles.