

**Is Onset of Gamma-Alumina Recrystallization Dependent on Crystallite Size?
A comparison of in-situ calcinations by High Temperature XRD and conventional ex-situ
calcinations with standard powder XRD.**

Colleen Costello, Collette Nicholas, Andrzej Ringwelski and MaryAnn Vanek
UOP LLC, A Honeywell Company
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Abstract

Thermally treated alumina supports are used as binders for adsorbents. The treatment temperature for these adsorbents is very close to temperature at which onset of recrystallization of the gamma phase to the theta-like phase is known to occur. A fundamental question was asked: is the onset temperature dependent on the crystallite size of the precursor? Several types of boehmite precursors were hydrothermally treated to effect boehmite crystal growth and subsequently calcined by in-situ High Temperature XRD and ex-situ in the temperature range of 700-900°C. Results of in-situ and ex-situ XRD investigation of thermally treated samples will be presented. We will also present an updated picture of gamma to theta transformation, including a discussion of the recently proposed gamma'-alumina phase.