

W0190

Structural Analysis of Chlorpropamide Polymorphs: A Potential Shear-Based Phase Transformation. Peter L.D. Wildfong^a, Stephan X.M. Boerrigter^a, Simon Bates^b, Kenneth R. Morris^a, ^aDept. of Industrial & Physical Pharmacy, Purdue Univ., West Lafayette, IN, ^bSSCI, Inc., West Lafayette, IN.

Transformations of chlorpropamide forms A and C were quantified as a function of pressure using *in situ* whole compact analysis by transmission XRD. The facile interconversion of both phases suggested a possible shear-based mechanism, which was studied by structural comparison of the two forms. The crystal structure of form A was obtained from the Cambridge Structural Database (refcode BEDMIG), while the structure for form C was solved from high quality laboratory X-ray powder diffraction data, returning a final R_{wp} of 5.59% following Rietveld refinement.

Analyses of the two crystal structures support the possibility that interconversion between forms A and C could occur by shear. Molecules in both structures have very similar orientations, with only slight conformational differences between the two. Calculations of lattice attachment energies indicate that both phases have a common set of crystallographic planes across which intermolecular interactions are very weak. Small displacements by shear parallel to these planes allow the slight reorientation of molecules necessary to drive the observed transformation between the two forms.