***In situ* X-ray Diffraction, DSC and Raman Spectroscopy Thermal Investigation of Chlorpropamide**

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Thermal analysis techniques, especially DSC, provide very useful information to identify and characterize APIs. What is more, DSC is widely accepted as a thermo-analytical tool for the study of phase transitions in different type of compounds. Unfortunately, this method does not reveal the identity of the transforming phases and their identification is often difficult without the aid of techniques that give information regarding structures and reactions. In this respect, X-ray diffraction and Raman spectroscopy are reliable techniques for phase identification. Thus, these methods are considered complementary to each other and the development of the instruments combining some of these techniques is a very powerful methodology with can have many applications for the characterization of pharmaceutical solids. For all these reasons, the aim of the present work is to apply Simultaneous WAXD-DSC, using Synchrotron Radiation, and temperature dependent Raman spectroscopy measurements to the study of the model drug chlorpropamide, which presents several polymorphs and phase transitions.

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