MS28-1-10 Polymorphic landscape of pharmaceutical solid solutions
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M. Lusi [1]
[1]**University of Limerick - Limerick (Ireland)**

Abstract
In the pharmaceutical industry, polymorphism represents both a potential issue as well as an opportunity to isolate a solid form with improved properties, for manufacturing, storage or administration. Indeed polymorph screening is common practice in the early stage of drug development. The phenomenon is well documented for single component and multicomponent molecular crystals. For almost a century, practical rules of thumbs for the design of solid solutions have overlooked the possibility of polymorphism for these phases. In recent years though, the occurrence of polymorphism in mixed crystals and solid solutions has been highlighted.
Here novel examples of polymorphism are presented for substitutional solid solutions and mixed cocrystals. In most cases the crystal structure of the mixed product depends on the composition i.e. it is chemically controlled. In other instances real polymorphism occurs at the same composition due to variation of crystallization methods (synthetic controlled) or external conditions (physical controlled). Finally the relationship between physical properties (solubility and stability), crystallography (solid form) and chemistry (composition) is discussed to determine the potential use of solid solutions to probe and control the polymorphic landscape of pharmaceutical solid solutions.

Solid state landscape of a racemic mixed cocrystal