Quantification of Multiple Amorphous and Crystalline Phases

Maria Orlova, PANalytical B.V., Zürich, Switzerland

Detlef Beckers, Thomas Degen, PANalytical B.V., Almelo, The Netherlands

maria.orlova@malvernpanalytical.com

The physico-chemical properties of pharmaceuticals are depending on their solid-state form. The crystallinity of an active ingredient has a strong influence on both processing behavior as well as its bioavailability. Due to higher thermodynamic stability, the desired solid-state form of an active pharmaceutical ingredient is usually crystalline. However, the amorphous state is sometimes required to achieve sufficient efficacy for low soluble compounds. During the processing of pharmaceutical solids, certain processes can disrupt the crystalline structure and lead to formation of amorphous regions. To establish the integrity of the finished product it is therefore important, to be able to determine the existence and quantify the amount of amorphous material within a crystalline matrix and vice versa. In this presentation we compare different methods to quantify crystalline and amorphous organic compounds including multiple phase mixtures. Results from different full pattern quantification methods are compared on accuracy and limitations in application.