

QUANTITATIVE PHASE ANALYSIS OF PHARMACEUTICAL COMPOUNDS BY THE WHOLE-PATTERN DECOMPOSITION METHODS

A POWERFUL ANALYTICAL APPROACH USING X-RAY POWDER DIFFRACTION DATA

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Quantitative phase analysis (QPA) in polycrystalline mixtures is a basic goal in pharmaceutical development. X-ray powder diffraction (XRPD) is classically used according to the empirical methods based on the comparison of intensities of some peaks of the different phases. Today alternative approaches based on a full-pattern fitting technique are available and offer several advantages.

In the first part of our study, QPA were performed by the whole pattern decomposition methods on a drug substance exhibiting large and complex structures as a mixture of an anhydrous and a hydrate phase (pseudo-polymorphism). The Rietveld method as well as an alternative procedure when structural model are not available were tested in the whole range of proportion (from 1 % to 99 % of crystalline phases).

Secondly, refinement procedures were applied on drug products (lyophilisates, granulates, ...) to determine weight fractions of API and excipients. When some excipients exhibit an amorphous state, supportive techniques such as DSC could be used to estimate global amorphous content in drug products.

Once established, refinement methods can be easily used as a fast and reliable approach for quantitative analysis of pharmaceutical compounds using XRPD data.