

# STRATEGIES TO SOLVE THE PROBLEM OF SOLID STATE CHARACTERIZATION OF MECHANOCHEMISTRY PRODUCTS

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In the last decade the use of mechanochemistry for the preparation of new compounds has been extensively studied. Started as a serendipitous way to obtain new crystal forms, nowadays it is a routine approach to look for new compounds. Several successful examples of formation of new polymorphs, co-crystals, ionic co-crystals and coordination compounds which have been obtained by grinding or kneading will be presented with particular attention to new crystalline phases of active pharmaceutical ingredients and luminescent complexes. In some cases the new materials can be obtained only by solid state process. However the new compounds obtained need a full characterization, preferably also including the structural determination characterization, to study structure – property relationship and design new improved material. Unfortunately impossibility to obtain single crystals for X-ray structure determination can be the drawback which weakens the potentiality of mechanochemistry. The synergic use of X-ray powder diffraction and spectroscopic and calorimetric techniques can overcome this problem and the structure can be determined from X-ray powder diffraction data with “direct space” methods.