



Time-Resolved In Situ monitoring of a mechanochemical reaction: the chronical of an impact.

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Abstract

The ability to drive chemical transformation by means of mechanical force has been recently rediscovered as an attractive and cost-effective tool for the synthesis of organic, metal–organic and inorganic compounds and materials. Providing a sustainable and cheaper strategy for synthesis as compared with traditional solution methods, mechanochemistry was selected by the IUPAC as one of “the 10 chemical innovations that will change our world”.

Traditionally, mechanochemical reactions have been studied *ex situ*, wherein the reaction is stopped, and material is removed from the reactor for analysis. Time-resolved in situ (TRIS) monitoring approaches have opened the door to exceptional detail regarding mechanochemical reactions. A few examples of solid-state reactions will be discussed with details of the mechanism of chemical transformations.



Biography

Prof Paolo Mazzeo, from the University of Parma is a solid-state chemist and crystallographer. His research is focused on Mechanochemistry and Crystal Engineering, mainly on the design, synthesis and characterization of cocrystals and crystalline sponges made of flexible MOF-guest systems. In particular, he is interested in the structural dynamical interpretation of the loading and release process of volatile guest molecules related to environmental sustainability. He is also involved in the field of Time Resolved In-Situ (TRIS) XRPD monitoring of mechanochemical reactions by means of synchrotron radiation. He was awarded a PhD in Chemical Science at the University of Bologna in 2014 on solid-state metal-organic compounds for optoelectronic devices. Then he moved in Switzerland as Crystallographer and Material Scientist at Excelsus Structural Solutions, a spin-off company of the Swiss Light Source at Paul Scherrer Institute, where he dealt with Structure Solution and Refinement from X-ray Powder diffraction data. He finally moved to the University of Parma in 2017 where he is currently a researcher at the Department of Chemistry, Life Sciences And Environmental Sustainability