Video: Mechanisms of mechanochemistry

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The solvent-free mechanochemical synthesis of a metal-organic framework, ZIF-8, was followed in real-time by in situ X-ray diffraction monitoring. Formation of the open framework is recognized by the appearance of new diffraction rings in the central part of the image, the small black spots are diffraction signals of the microcrystalline organic reactant (2-methylimidazole), while the inorganic reactant (zinc oxide, ZnO) is a fine powder, so produces the three characteristic diffraction rings on the perifery of the image.

The movie contrast changes a lot because milling is done using a stainless steel ball that passes through the beam, causing X-ray absorption effects.

Movies were prepared by collaborator Ivan Halasz (Institute Ruder Boskovic), based on the synchrotron data published in *Nature Chemistry*.

More information: "Real-time and in situ monitoring of mechanochemical milling reactions." *Nature Chemistry* 5, 66–73 (2013) DOI: 10.1038/nchem.1505

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