MS29 Crystal engineering: structural flexibility, phase transitions and non-standard manipulation of synthons

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Mechanically responsive crystals: tuning flexibilty through fine-tuning intermolecular interactions

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Abstract

Responsiveness of crystalline solids, in particular molecular crystals, to a variety of external stimuli has become a highly desired property as it enables their application in emerging technologies. Although adaptability of crystals to external stimuli other than sole mechanical force has been widely reported, mechanically stimulated flexibility is still relatively rarely observed among molecular crystals and the rationale behind those responses is far from being fully understood [1].

Coordination polymers, in addition to being ideal model systems for exploring structural prerequisites for delivery of a specific mechanical response [2], have recently offered a range of not hitherto observed mechanical behaviours of crystalline materials [3-5]. Supramolecular interactions, in particular hydrogen and halogen bonds, emerged as one of the key structural features in the delivery of a targeted mechanical response, and their role in fine-tuning those responses, as well as a correlation of their influence in crystal packing and mechanical response, will be demonstrated on several recent examples [3-7].

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