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Elastic Flexibility in Molecular Crystals

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Molecular crystals are generally considered to be brittle and inelastic but they can in fact display remarkable elastic flexibility. For example, acicular crystals of bis(acetylacetonato)copper(II) can be tied, reversibly, in an overhand knot.

We have investigated the dynamic crystalline supramolecular chemistry that gives rise to this elasticity. In so doing we have determined the mechanism of elastic flexing of a single crystal, for the first time and with atomic resolution, using single crystal microcrystallography (1) (MX2 Beamline, Australian Synchrotron).

The relationships between supramolecular chemistry, crystal packing, crystal morphology, elasticity and the mechanism of elastic contortion of [Cu(acac)₂] crystals will be presented along with a discussion of the significance of this work in the context of current and widely-held perceptions of crystalline materials.

(1) Worthy A, Grosjean A, Pfrunder MC, Xu Y, Yan C, Edwards G, Clegg JK, McMurtrie JC, *Nature Chem.*, **2018**, 10, 65-69.

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