

Oral Contributions

[MS18-03] Negative Linear Compressibility in Molecular Framework Materials.

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Negative linear compressibility (NLC) is the rare but desirable material property of uniaxial expansion under increasing hydrostatic pressure. The performance of NLC materials — for use in areas such as sensitive pressure sensing, actuators, and development of artificial muscle [1–3] — depends on the magnitude and sustainability of intrinsic NLC response. The few “canonical” NLC materials known exhibit responses that are too small in comparison to the usual compressibilities of engineering materials for practical applications [3]. This talk reviews the very recent discovery of extreme NLC behaviour in a handful of molecular framework materials, including the simple transition-metal cyanides $\text{KMn}[\text{Ag}(\text{CN})_2]_3$ and $\text{Zn}[\text{Au}(\text{CN})_2]_2$ [4,5]. The establishment of general design principles for maximising NLC response is discussed, with particular reference to the potential for exploiting the versatile structural chemistry of metal–organic frameworks.

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