Light- and Temperature-Assisted Spin State Annealing: Accessing the Hidden Multistability

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Among the responsive multistable materials, spin crossover (SCO) systems are of particular interest for stabilizing multiple spin states with various stimulus inputs and physical outputs. Here in a 2D Hofmann-type coordination polymer \([\text{Fe(isoq)}_2\{\text{Au(CN)}_2\}_2]\) (isoq = isoquinoline), hidden multistability of the spin state is accessed by introducing an medium-temperature annealing after a light/temperature stimulation. With the combined effort of magnetic, crystallographic and Mössbauer spectral investigation, these distinct spin states are identified and the light- and temperature-assisted transition pathways are clarified. Such excitation-relaxation and trapping-relaxation joint mechanisms, as ingenious interplays between the kinetic and thermodynamic effects, uncover hidden possibilities for the discovery of multistable materials and the development of multistate intelligent devices.
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