

Reversible thermo- and mechanochromic behaviour in a 3D hydrogen bonded discrete complex

Abstract

A 3D hydrogen-bonded Co(II) complex $\{ \text{Co}(\text{34pbz})_2 \cdot (\text{H}_2\text{O})_4 \}_n$ (1), where 34pbz is 3-(4-pyridyl)benzoate, is found to exhibit classical thermo- and mechanochromic behaviour. The thermochromic behaviour in the temperature range of 30 – 120 °C is attributed to the disruption of the supramolecular environments. Above 150 °C this behaviour is attributed to loss of coordinated water molecules from the Co(II) which has the effect of altering the visible d-d electronic transitions. Interestingly, when crystals of 1 are ground, a purple colour is observed at ambient light. This mechanochromic property is ascribed to change in the crystal field around the Co(II) centre. These effects are fully reversible as suggested by PXRD and thermal analysis studies.