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Control of a thermosalient phase transition by solid solutions

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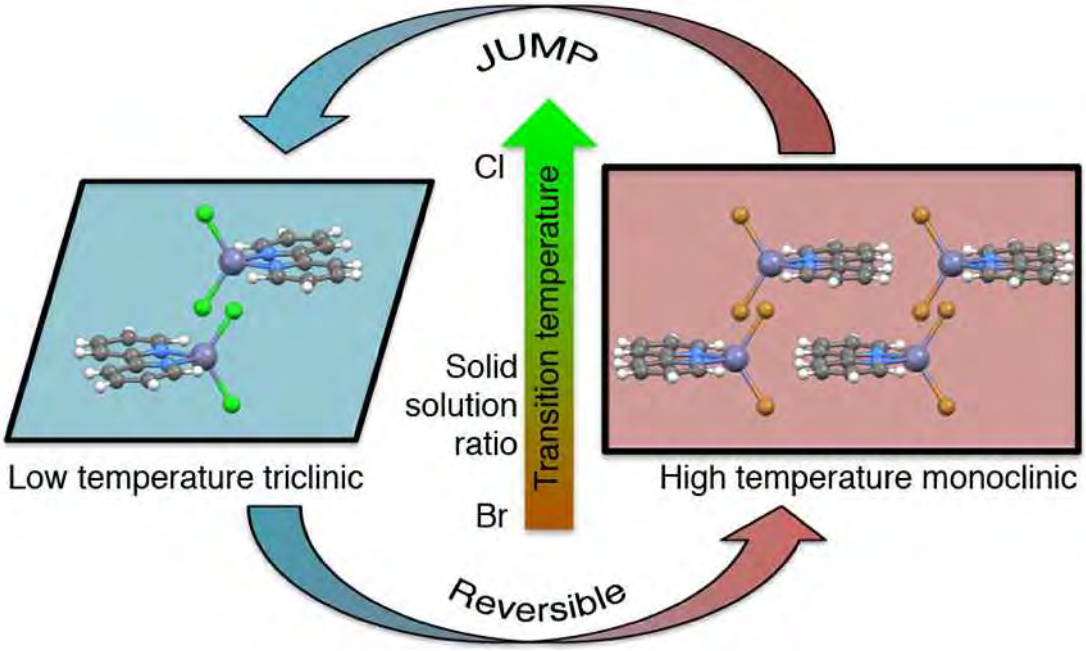
Thermosalient crystals that exhibit macro-scale motion upon phase transition could be useful as actuators that are capable of converting thermal energy into motion or mechanical work in macroscopic devices.[1] The application capability of these miniature actuators for energy conversion depends on the temperature range and dynamics of transition. While the thermo-mechanical performance cannot be systematically varied with a pure molecular crystal, solid solutions could present a way to intentionally tune both the dynamics and the temperature of the transition in a continuous manner (Figure 1). To verify this hypothesis, Zn(2,2'-bpy)Br_2,[2] was selected as a thermosalient material which could form solid solutions (or mixed complexes) with Zn(2,2'-bpy)Cl_2. Only one form (isomorphous to one of the two Zn(2,2'-bpy)Br_2 forms) has been reported for the chloride.[3] The results indicate that indeed, the two complexes form solid solutions in varying ratios. The mixed crystals undergo the same phase transformation as the pure Zn(2,2'-bpy)Br_2 at a Cl/Br-ratio-dependent temperature. The temperature and dynamics of the thermosalient phenomenon correlates with the Cl/Br-ratio.

[1] *Ž. Skoko, S. Zamir, P. Naumov, J. Bernstein, J. Am. Chem. Soc., 2010, 132, 14191–14202.,* ***[2]*** *M. Lusi and J. Bernstein, Chem. Commun., 2013, 49, 9293–9295.,* ***[3]*** *M. A. Khan and D. G. Tuck, Acta Cryst., 1984, C40, 60–62.*



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