

Light-induced spin-state switching in the mixed crystal series of the 2D coordination network $\{[Zn_{1-x}Fe_x(bbtr)_3](BF_4)_2\}_\infty$: optical spectroscopy and cooperative effects.

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Streszczenie

Depending on the iron(II) concentration, the mixed crystals of $\{[Zn_{1-x}Fe_x(bbtr)_3](BF_4)_2\}_\infty$, $bbtr = 1,4\text{-di}(1,2,3\text{-triazol-1-yl})\text{butane}$, $0.01 \leq x \leq 1$, show macroscopic light-induced bistability between the high-spin and the low-spin state. In the highly diluted system with $x = 0.01$ and up to $x = 0.31$, the photoinduced low-spin state always relaxes back to the high-spin state independent of the initial light-induced low-spin fraction. In the highly concentrated mixed crystals with $x = 0.67$, 0.87 and 1 , the strong cooperative effects coupled to a crystallographic phase transition result in light-induced bistability with decreasing critical light-induced low-spin fraction and increasing hysteresis width for increasing iron(II) concentrations. The lower limit for the light-induced bistability is estimated at $x \approx 0.5$.

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