

## Thermal and light-induced spin switching dynamics in the 2D coordination network of $\{[Zn_{1-x}Fe_x(bbtr)_3](ClO_4)_2\}_\infty$ : the role of cooperative effects.

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### Streszczenie

The thermal spin transition, the photoexcitation, and the subsequent spin relaxation in the mixed crystal series of the covalently linked two-dimensional network  $\{[Zn_{1-x}Fe_x(bbtr)_3](ClO_4)_2\}_\infty$  ( $x = 0.02-1$ ,  $bbtr = 1,4$ -di(1,2,3-triazol-1-yl)-butane) are discussed. In the neat compound, the thermal spin transition with a hysteresis of 13 K is accompanied by a crystallographic phase transition (Kusz, J.; Bronisz, R.; Zubko, M.; Bednarek, H. *Chem. Eur. J.* 2011, 17, 6807). In contrast, the diluted crystals with  $x \leq 0.1$  stay essentially in the high-spin state down to low temperatures and show typical first order relaxation kinetics upon photoexcitation, and the structural phase transition is well separated from the spin transition. With increasing Fe(II) concentration, steeper thermal transitions and sigmoidal relaxation curves indicate increasingly important cooperative effects. Already at  $x = 0.38$ , the spin relaxation is governed by cooperative interactions between Fe(II) centers, and the crystallographic phase transition begins to influence the spin transition. The kinetic behavior of the thermal spin transition is reproduced within the framework of a dynamic mean-field model.

### Adres publiczny

<http://dx.doi.org/10.1021/ic301006c>

### Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>