Light-induced bistability in the 2D coordination network $\{[Fe(bbtr)_3][BF_4]_2\}_\infty$: wavelength-selective addressing of molecular spin states.

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Where as the neat polymeric Fe^{II} compound $\{[Fe(bbtr)_3][ClO_4]_2\}_\infty$ (bbtr=1,4-di(1,2,3-triazol-1-yl)butane) shows an abrupt spin transition centered at 107 K facilitated by a crystallographic symmetry breaking, in the covalently linked 2D coordination network of $\{[Fe(bbtr)_3][BF_4]_2\}_\infty$, Fe^{II} stays in the high-spin state down to 10 K. However, strong cooperative effects of elastic origin result in reversible, persistent, and wavelength-selective photoswitching between the low-spin and high-spin manifolds. This compound thus shows true light-induced bistability below 100 K. The persistent bidirectional optical switching behavior is discussed as a function of temperature, irradiation time, and intensity. Crystallographic studies reveal a photoinduced symmetry breaking and serve to establish the correlation between structure and cooperative effects. The static and kinetic behavior is explicated within the framework of the mean-field approximation.

Słowa kluczowe

cooperative effects, Iron, photoinduced bistability, photoswitching, Spin crossover

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