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Strong coupling between spin crossover, fluorescence and viscoelasticity in soft nanocomposites



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Among the switchable materials, the spin crossover (SCO) complexes are of particular interest, notably because of their potential applications in the development of new generations of electronic devices.^(1,2) However, these molecular systems, generally characterized as crystalline powders, can be sensitive to normal atmospheric conditions and are difficult to process. Such limitations and their conjunction with the desire to develop multifunctional systems displaying other physical properties such as electric conductivity, or fluorescence,⁽³⁻⁶⁾ have prompted some groups, since the last two decades, to develop composite systems resulting from the dispersion of cooperative SCO complexes in polymer matrices chosen for their physical and mechanical properties.⁽³⁻⁹⁾ Following this approach, we focused on organic polymers exhibiting viscoelastic behaviour and other properties such as fluorescence or electric conductivity, with the aim to design soft multifunctional composites. In this context, we have prepared several series of soft nanocomposites based on the “Fe^{II}-triazole” cooperative SCO chains, dispersed in the viscoelastic and fluorescent sodium polystyrene sulfonate (PSS) matrix.^(10,11)

In this contribution we describe a series of critical-like gel nanocomposites showing strong coupling between spin crossover, fluorescence and viscoelasticity.

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