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Spin crossover beyond room-temperature - A matter of substitution

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Increased interest and research efforts focus on molecular bistability, as materials tuneable by external stimuli are considered as promising for future technological applications.
One of the requirements for applicability is the existence of two defined states, each of them addressable under defined circumstances. This relates to materials featuring spin crossover (SCO), characterized by two defined spin-states with significant differences in e.g. magnetic moment, bond-length, colour, dielectric constant or electrical resistance.[1]
Current efforts in our group focus on the advanced control of the spin transition, yielding materials with a spin-transition around room-temperature.
Herein we report about the preparation of different group 14 organyls attached to one or two tetrazole-moieties and their coordination behavior towards iron(II).
These substances represent the first class of metallated-tetrazole SCO complexes featuring a reversible spin transition beyond room-temperature and a remarkable stability towards ambient conditions.
Variable temperature magnetic and electronic spectra were used to characterize both spin states. Finally, besides the above mentioned bistability in solid state, also a SCO behavior in solution was observed. (Fig.1)

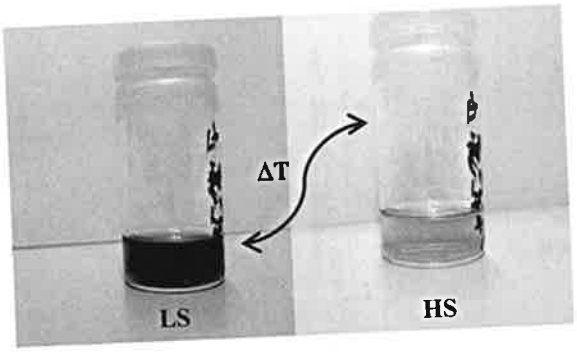

Figure 6: Solution SCO of $[Fe(Me_3SiTz)_6](CF_3SO_3)_2$

Referenzen:

[1] M. A. Halcrow (Ed.), *Spin Crossover Materials Properties and Applications*, **2013**, Wiley, ISBN 9781119998679