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Synthesis and properties of cobalt(II) coordination polymers linked by 4'-(4-pyridyl)-2,2':6',2''-terpyridine

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Dedicated to Professor Spyros Perlepes on the occasion of his 65th birthday.

ABSTRACT

The cationic one-dimensional coordination polymers $[\{\text{Co}(\text{pyterpy})_2\}\{\text{M}(\text{hfac})_2\}]^{2+}$ ($\text{M} = \text{Co(II)}$ or Zn(II) ; $\text{pyterpy} = 4'-(4\text{-pyridyl})-2,2':6',2''\text{-terpyridine}$; $\text{hfac}^- = \text{hexafluoroacetylacetonate}$) feature alternating $\{\text{Co}(\text{pyterpy})_2\}$ and $\{\text{M}(\text{hfac})_2\}$ units linked through heteroditopic pyterpy ligands. Cocrystallization with $[\text{M}(\text{hfac})_3]^-$ ($\text{M} = \text{Co(II)}$ or Zn(II)) counteranions has afforded the compounds: $[\{\text{Co}(\text{pyterpy})_2\}\{\text{Co}(\text{hfac})_2\}][\text{Co}(\text{hfac})_3]_2$ (**1**) and $[\{\text{Co}(\text{pyterpy})_2\}\{\text{Co}_{0.7}\text{Zn}_{0.3}(\text{hfac})_2\}][\text{Zn}(\text{hfac})_3]_2$ (**2**). Variable temperature crystallographic and magnetic studies indicate low spin cobalt(II) ions in the $\{\text{Co}(\text{pyterpy})_2\}$ components of the coordination polymers up to room temperature; magnetic studies suggest the onset of a thermally-induced spin crossover at these centers above room temperature.

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