Synthesis, Characterisation and Crystal Structure of a Cyano-Bridged Polymeric Yttrium-Iron Complex \{[Y(phen)$_2$(H$_2$O)$_2$Fe(CN)$_6$]$\cdot$8H$_2$O\}_n

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A new cyano-bridged 1D polymeric linear chain complex \{[Y(phen)$_2$(H$_2$O)$_2$Fe(CN)$_6$]$\cdot$8H$_2$O\}_n (where phen = 1,10-phenanthroline) has been synthesised and its crystal structure determined. The yttrium(III) and iron(III) centres achieve distorted square antiprismatic and slightly distorted octahedral geometry, respectively. Presence of an extensive network of hydrogen bonds present in the complex impart the overall stability to the system. The presence of ten water molecules per molecular unit has been confirmed by thermogravimetric analysis.