

A New Polymeric Barium-Iron (III) Complex with Chain and Large Ring Structure

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The compound $\{[\text{Ba}_6(\text{Phen})_{12}(\text{CF}_3\text{COO})_6\{\text{Fe}(\text{CN})_6\}_2(\text{H}_2\text{O})_8]\cdot 6 \text{H}_2\text{O}\}_n$ (**1**) (Phen = 1,10-phenanthroline) has been synthesized and structurally characterized. In the crystal structure, the two consecutive Ba centres are bridged through trifluoroacetate groups and also *via* cyano groups of $[\text{Fe}(\text{CN})_6]^{3-}$ and form the zigzag chain resulting the formation of 24-membered ring structure. The Ba-centres are 8-fold coordinated with distorted cubic geometry. Six H₂O molecules per asymmetric unit remain in the structure without any direct interaction with the metal atoms but they act in hydrogen bond formation.

Key words: Barium-Iron Complex, Cyano and Trifluoroacetate Bridge, Chain and Large Ring, Crystal Structure