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NEW IRON (III) COORDINATION COMPOUNDS WITH APPLICATIONS IN WATER TREATMENT

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Abstract

Three new iron (III) coordination polymers, namely $\{Fe[(C_2H_5)(C_4H_9)PO_2]_3\}_n$, $\{Fe[(C_2H_5)(C_4H_9)POS]_3\}_n$, and $\{Fe[(C_2H_5)(C_4H_9)PS_2]_3\}_n$ have been synthesised using iron (III) acetylacetonate as iron precursor and a succession of ligands derived from phosphinic acid: ethylbutyl-phosphinic acid, ethylbutylthio-phosphinic acid, and respectively ethylbutyldithio-phosphinic acid. Chemical analysis, gel-chromatography, infrared spectroscopy (IR), Mössbauer spectroscopy, X-ray diffraction (XRD) and thermal gravimetric analysis (TGA) have been used as characterization methods. Based on the experimental results and on literature data the structures of the studied compounds were assigned. The organophosphinic acids were also tested as iron chelators for water treatment.

Key words: iron chelators, iron coordination polymers, water treatment

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