Turkish Journal of Chemistry

Turkish Journal

of

Chemistry

Template Synthesis and Structural Characterization of Homo Binuclear Chromium(III), Manganese(III), Iron(III), Cobalt(III), and Ruthenium(III) Complexes with Octaazamacrocyclic Ligands

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Keywords
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Abstract: The Schiff base octaazamacrocyclic ligands derived from primary diamines and 3,6-dimethyl/diphenyl-4,5-diazaocta-3,5-diene-2,7-dione, and their binuclear complexes $[M_2LCl_4]Cl_2$ [M = Cr (III), Fe(III), Co(III), or Ru(III)] and $[Mn_2L(AcO)_4](AcO)_2$ were synthesized by template condensation reactions. Attempts to synthesize the corresponding metal-free macrocyclic ligands did not prove successful. The overall geometry and stereochemistry of these complexes were elucidated by elemental analyses, magnetic susceptibilities, electronic spectra, infrared spectra, molar conductance measurements, ^1H NMR, and thermogravimetric analysis. All the trivalent metal ion complexes appear to be 1:2 electrolytes. An octahedral geometry is proposed for all the complexes.

Key Words: Synthesis, chromium, manganese, iron, cobalt, ruthenium, macrocycles

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Turk. J. Chem., **30**, (2006), 755-767.
Full text: pdf
Other articles published in the same issue: Turk. J. Chem.,vol.30,iss.6.