


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## Chromium(III) Complexes with Different Chromospheres Macrocyclic Ligands: Synthesis and Spectroscopic Studies

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**Abstract:** Symmetric tetradentate ( $L^1$ ) and asymmetric pentadentate ( $L^2$ ) macrocyclic ligands that possess 2 dissimilar coordination sites were prepared. One has a 4-coordinate ( $N_4$ ) and the other has a 5-coordinate ( $N_2O_3S$ ) donor set. Trivalent Cr(III) complexes were synthesized with  $L^1$  and  $L^2$  and their structures were investigated using elemental analyses and magnetic moment, electronic, IR,  $^1H$  NMR,  $^{13}C$  NMR and EPR spectra. All the Cr(III) complexes show magnetic moments corresponding to a high-spin configuration.  $\Delta$  values indicate the energy difference between the principle bands, which are formed due to ligand field absorption. The spin-orbit coupling parameter,  $\lambda$ , gives no significance because the splitting of doublet transition lines is too large to be explained by spin-orbit coupling.  $\nu$  values indicate that the complexes under study have a substantial covalent character.  $g$ -values were also calculated using the spin-orbital coupling constant,  $\kappa$ .

**Key Words:** Macrocyclic ligands,  $^1H$  NMR,  $^{13}C$  NMR, IR, EPR, Cr(III) complexes

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