Turkish Journal of Chemistry

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Synthesis and Physico-chemical and Spectroscopic Investigations of Sodium Dihydrobis(1,2,3-benzotriazolyl)borate Ligand and Its Transition Metal Complexes

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Abstract: The title ligand, sodium dihydrobis(1,2,3-benzotriazolyl)borate, $Na[H_2B(BTz)_2]$, was synthesized by refluxing 1 mole of sodium borohydride with 2 moles of 1,2,3- benzotriazole in toluene. The ligand shows ample reactivity towards Cr(III), Mn(II), Fe(III), Fe(II), Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Hg(II) metal ions and forms stable complexes. The ligand and its metal complexes were characterized by physico-chemical and spectroscopic techniques. All the complexes of divalent metal ions are tetrahedral except for Cu(II), which has been proposed to have a square-planar geometry. The complexes of Cr(III) and Fe(III) appear to have an octahedral geometry. The magnitude of molar conductance of 10^{-3} M solution indicates that all the complexes are non-electrolytic.

Key Words: Dihydrobis(1,2,3-benzotriazolyl)borate ligand, metal complexes, spectral studies, electronic spectra

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Turk. J. Chem., **31**, (2007), 179-189.
Full text: pdf
Other articles published in the same issue: Turk. J. Chem.,vol.31,iss.2.