

Metal Ion-Binding Properties in Aqueous Solution of the Nucleoside Analogue, 5,6-Dichloro-1-(β -D-ribofuranosyl)benzimidazole (DRB)

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The stability constants of the 1:1 complexes formed between Mg^{2+} , Ca^{2+} , Sr^{2+} , Ba^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} or Cd^{2+} ($= M^{2+}$) and 5,6-dichloro-1-(β -D-ribofuranosyl)benzimidazole (DRB) were determined by potentiometric pH titrations in aqueous solution (25 °C; $I = 0.5$ M, $NaNO_3$). The acidity constant of $H(DRB)^+$, the proton being at N3, was measured by the same method and the result was confirmed via spectrophotometry. Based on previously established [L. E. Kapinos, B. Song, H. Sigel, *Inorg. Chim. Acta* **280**, in press (1998)] $\log K_{ML}^M$ versus pK_{HL}^H straight-line plots for complexes of imidazole-type ligands it is shown for the $Mn(DRB)^{2+}$ and $Zn(DRB)^{2+}$ complexes, as examples, that the benzene ring of the benzimidazole residue exerts a steric inhibition for metal ion binding at N3; *i.e.*, the data points for the $M(DRB)^{2+}$ complexes fall clearly below the straight lines defined by the imidazole-type ligands.

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