

Structure and properties of a family of sugar vanadates incorporating VO³⁺

KAJAL KRISHNA RAJAK^a and SANKAR PRASAD RATH^b

^aDepartment of Chemistry, Jadavpur University, Calcutta 700 032, India

^bDepartment of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta 700 032, India

Protected carbohydrates, having two free *cis* hydroxyl groups, (general abbreviation H₂SUG) have been synthesized and their reactions with VO(L-Asal)(OMe) (OHMe)/VOL(L-Asal)(H₂O) in dichloromethane/methanol have afforded mononuclear esters of type VO(HSUG)(Asal) as dark-coloured solids (red in solution). Here, L-Asal²⁻ is the deprotonated salicylaldimine of L-alanine (A = a), L-valine (A = v) and L-phenylalanine (A = p). The X-ray structures of representative cases (e.g. VO(βD-HMe₃GP)(Lvsal), where βD-H₂Me₃GP is methyl-2,6-dimethoxy-βD-galactopyranoside) show that the carbohydrates bind to the metal site as a five-membered O,O-chelate ring in a monoionized state, the undissociated hydroxyl group lying *trans* to the *oxo*-oxygen atom. The X-ray structures also show that the chiral configuration of the metal site corresponds exclusively to the endo disposition of the V=O and the amino acid C-R bonds. Solution studies (¹H and ⁵¹V NMR) show that the molecular structures observed in the solid state are grossly preserved in solution.

