

Reactions of Polyols with Boric Acid and Sodium Monoborate

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Received May 31, 2004

Abstract—Complex formation was studied in the systems boric acid (sodium monoborate)–polyol (*D*-sorbitol, mannitol, dulcitol, xylitol, glycerol)–water, concentrational stability constants of the complexes and ionization constants of bis(polyol)boric acids were estimated. In the systems *D*-sorbitol, *D*-mannitol, dulcitol, glycerol–boric acid–water electric conductivity increases sharply to peak at the molar ratio polyol:boric acid = 2:1; in the case of dulcitol there appears yet another peak at the molar ratio polyol:boric acid = 1:1. In the systems *D*-sorbitol, *D*-mannitol, glycerol–sodium monoborate–water three complex anions: $[\text{BPolyol}_2]^-$ in acidic, $[\text{BPolyol}]^-$, and $[\text{B}_2\text{Polyol}]^{2-}$ in neutral and basic regions of the system were revealed, their stability being dependent on the nature of the polyol and the overall concentration of the solution. In the system dulcitol–sodium monoborate–water only one complex anion $[\text{BDulc}]^-$ is formed, and in the system xylitol–sodium monoborate–water dimeric complex $[\text{BXyl}]^-$ is found.