

# **Synthesis and solution properties of a new pH-responsive polymer containing amino propanesulfonic acid residues**

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## **ABSTRACT**

The reaction of diallylamine with 1,3-propane sultone led to the synthesis of the zwitterionic monomer 3-(diallylammonio)propanesulfonate. The sulfobetaine was cyclopolymd. in water in the presence of sodium chloride with tert-BuOOH as an initiator to afford a polysulfobetaine (PSB) in very good yield. PSB, upon treatment with sodium hydroxide, was converted into an anionic polyelectrolyte (APE). Although APE was readily sol. in salt-free water, PSB needed the presence of low-mol.-wt. salts (e.g., NaCl, KI, etc., in the range of 0.135-1.04 N) for its dissoln. The soln. properties of PSB and APE were investigated with potentiometric and viscometric techniques. The basicity const. of the amine was apparent and followed the modified Henderson-Hasselbalch equation; as the degree of protonation ( $\alpha$ ) of the whole macromol. increases, the protonation of the amine nitrogens becomes increasingly more difficult. The compn. and phase diagram of the aq. two-phase systems of APE/PSB and polyethylene glycol were also explored.