

# **Synthesis and Solution properties of a quaternary ammonium polyelectrolyte and its corresponding polyampholyte**

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## **ABSTRACT**

The quaternary ammonium salt, N,N-diallyl-N-5-carbomethoxypentyl-N-methylammonium chloride (DACPMAC), on cyclopolymn. in aq. soln. using tert-butylhydroperoxide, afforded the polyelectrolyte poly(DACPMAC), having five-membered cyclic structure on the polymeric backbone, in excellent yield. The polyelectrolyte on acidic hydrolysis of the pendent ester groups gave the corresponding polyampholyte poly(DAMAH) having the equiv. of 6-(N,N-diallyl-N-Me ammonio) hexanoate (DAMAH) as monomeric unit. The soln. properties of these polymers as well as the polyelectrolyte, poly(DACMMAC), and its corresponding polyampholyte, poly(DAMAE), [having the monomeric unit equiv. of N,N-diallyl-N-carboethoxymethyl-N-methylammonium chloride (DACMMAC) and N,N-diallyl-N-Me ammonio ethanoate (DAMAE)] are investigated by potentiometric and viscometric techniques. Basicity consts. of the polyampholytes are found to be 'apparent' and as such follow the modified Henderson-Hasselbalch equation. While the protonation of the polyampholyte poly(DAMAH) becomes more and more difficult as the degree of protonation ( $\alpha$ ) of the whole macromol. increases, the polyampholyte poly(DAMAE), exhibits the reverse trend i.e. the protonation process becomes easier and easier with increasing  $\alpha$ .