

**Saturation Swelling and The Seeded Emulsion ..
Polymerisation of Styrene at High Ionic Strength**

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Abstract :

The effects of adding inorganic electrolyte (below the critical coagulation concentration) have been investigated in two systems of emulsion polymerisation of styrene. In one system, potassium chloride, at different concentrations, was added at the end of interval I, using three different ionic emulsifiers : Potassium octadecanoate which has a low critical micelle concentration (CMC), potassium dodecanoate and sodium dodecyl sulfate (SDS) which have moderately high CMC. A significant increase in the rate of polymerisation was observed in all cases even at the higher levels of electrolyte at which the rate is reduced if the electrolyte is added from the onset of polymerisation.

In the second system, the effects of adding sodium chloride, in concentrations up to 0.20 M, on the seeded emulsion polymerisation of styrene have been followed. A significant increase in the rate was observed as electrolyte level was increased with no significant change in particle size. Saturation swelling measurements indicate a slight increase in monomer concentration inside the particles as electrolyte concentration was increased. Evaluation of the average number of free radicals per particle, \bar{n} , by a steady state approach indicates an increase in the value of \bar{n} as electrolyte level is increased. \bar{n} is below 0.5 but approaches this value at the highest electrolyte concentration. The increased surface area of the particles may account for this effect by increasing the capture efficiency of the radicals by the particles.