

PREPARATION OF ALKALI-SOLUBLE RESINS AND THEIR USE AS STABILISERS IN EMULSION POLYMERISATION

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Low molar mass alkali-soluble resins (ASRs) have been used as colloidal stabilisers in commercial emulsion polymerisations since the 1970s [1,2] and claimed that ASRs can offer advantages, including substantial Newtonian excellent mechanical and freeze thaw stability, and good pigment dispersion wetting properties [3, 4]. Despite their commercial importance, there have been very few studies of such systems and only a handful of papers are present in the literature [5-9].

This paper will report on studies of ASRs in emulsion polymerisation. ASRs with acid contents in the range 5-50 mol% and number-average molar mass between 1,000 and 10,000 g mol⁻¹ have been synthesised by free-radical solution copolymerisation of different combinations of methyl methacrylate (MMA), ethyl acrylate (EA), phenyl methacrylate, methacrylic acid and acrylic acid. The ASRs have been used as the only colloid stabiliser in emulsion polymerisations of MMA and EA. The emulsion polymerisations were found to be extremely fast and produced stable latexes with a particle diameter that depends upon the characteristics of the ASR. Grafting and physical adsorption of the ASR onto particle surfaces has been studied using gel permeation chromatography.

References

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