Free-Radical Degradation of Hydroxyethylcellulose

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Abstract

Hydroxyethylcellulose (HEC) is used as an effective steric stabiliser in emulsion polymerizations of acrylic and vinyl monomers. During persulphate-initiated polymerizations HEC is known to become both grafted to the polymer formed[1-4] and degraded[1-3,5]. This poster will report on experiments carried out to determine the extent of degradation of two commercial grades of HEC when heated in aqueous solution in the presence of two different types of water-soluble, free-radical initiator: (i) ammonium persulphate and (ii) 4,4′-azobis(4-cyanopentanoic acid). The concentrations of HEC and initiator were chosen to be similar to those used in typical latex formulations and the degradation of HEC was monitored using gel permeation chromatography. The decrease in molar mass of the HEC as a function of reaction time has been monitored and analysed using simple kinetics theory. Control experiments have been carried out to determine the effect of solution pH on the extent of HEC degradation.

References

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