

Differential Property of Cationic and Anionic Calcium Ion Cross-linked Pectin Gels

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Abstract

Pectin is a branched polysaccharides found in the cell wall of the plants and commonly used in food industry as a gelling agent, emulsifier or stabilizer. The effect of calcium chloride on the gelation of pectin dispersions was studied using rheology and light scattering measurements. Addition of calcium induced the gel formation in pectin dispersions follows egg-box crosslink mechanism. Zeta potential measurements revealed the formation of cationic and anionic pectin gels on concentration of calcium. The cationic gels had higher rigidity compared to anionic gels. The sol-gel transition has been investigated for pectin-calcium system from the structure factor data which indicated cationic gels undergo transition earlier compared to anionic ones. The gelation time was determined from rheology and viscosity experiments and found to be less for cationic gels.

Keywords: Ca²⁺-pectin Gels, Egg-box Model, Gel Elastic Behaviour, Gel Stiffness, Gel Structure Development, Pectin, Rheology of Gels