

Purification of cress seed (*Lepidium sativum*) gum: A comprehensive rheological study - DTU Orbit (08/11/2017)

Purification of cress seed (*Lepidium sativum*) gum: A comprehensive rheological study

In this paper, the effects of different purification methods (ethanol (sample E), isopropanol (sample I) and ethanol-isopropanol (sample EI)) on intrinsic viscosity, steady and dynamic rheological properties of cress seed gum were investigated. The gum dispersions exhibited viscoelastic properties, the storage modulus (G') was higher than the loss modulus (G''), and mechanical spectra of the crude and purified cress seed gums were classified as weak gels. The purified samples had stronger and more elastic network structure than the crude gum (CSG) and the gel network got stronger along the series of I, EI and E. All the gum dispersions indicated shear-thinning behavior and the viscosity of the samples followed the order of $E > EI > I > CSG$. Herschel-Bulkley model was the best model to describe steady shear flow behavior and Arrhenius-type model was also applied to describe the effect of temperature. Crude cress seed gum and EI showed the highest and the lowest activation energy, respectively. The crude and purified gums indicated thixotropic behavior and CSG exhibited the lowest hysteresis loop area and the highest structural recovery. All the samples revealed random coil conformation in dilute regimes, and chain flexibility and intrinsic viscosity enhanced after purification. Intrinsic viscosity of the purified samples increased along the series of I, EI and E.

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