THE CALIBRATION OF GPC FOR PECTINS

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Commercial high-methoxyl citrus pectin was fractionated on Sepharose 2B/ Sepharose 4B. Molecular weights of the fractions each were determined by light scattering (M_w), sedimentation analysis (M_w), and membrane osmometry (M_n). According to the rule molecular weights decreased with increasing elution volume. Whereas values obtained by sedimentation analysis and membrane osmometry were consistent with each other giving $M_w / M_n \sim 1.2$, all molecular weights derived from light scattering were higher by approximately one order of magnitude. This fact as well as strong angular dependencies of the scattered light suggested bimodale systems. Coincidence with results of sedimentation analysis was achieved by the interpretation of light scattering data in terms of a two-component system assuming the firstly eluted pectinaceous fraction with the highest M_w as representative for particles. Traces of the particle component dominating especially within the small angle region of light scattering were present in all the GPC fractions apart from the molecularly dispersed major component. The experimental scattering curve of the particle component correponded to a master curve of sphere-like particles with a molecular weight $M_w \sim 5. 10^8$, radius $a_m = 132$ nm, and polydispersity $\sigma = 0.6$.

Light scattering technique and capillary viscosimetry were employed to establish the universal calibration. A uniform straight line was obtained for quite different pectins after the correction with respect to the particle component had been carried out. Validity of the results was checked up by investigations on other polysaccharides as carboxy-methyl cellulose, dextran, dextran sulphate, and glycogen.

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