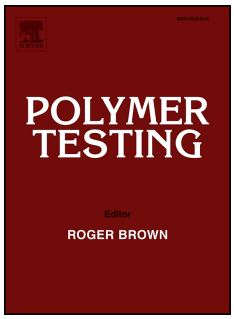

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PII: S0142-9418(17)30689-X

DOI: 10.1016/j.polymertesting.2017.09.003

Reference: POTE 5158

To appear in: *Polymer Testing*

Received Date: 23 May 2017

Revised Date: 27 July 2017

Accepted Date: 3 September 2017

Please cite this article as: M.P.M. da Costa, M.C. Delpech, Ivana.Lourenç. de Mello Ferreira, Maurí.Tavares. de Macedo Cruz, J.A. Castanharo, M.D. Cruz, Evaluation of single-point equations to determine intrinsic viscosity of sodium alginate and chitosan with high deacetylation degree, *Polymer Testing* (2017), doi: 10.1016/j.polymertesting.2017.09.003.

Evaluation of Single-point equations to determine intrinsic viscosity of sodium alginate and chitosan with high deacetylation degree

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ABSTRACT

A viscometric study of two polyelectrolytes, chitosan (CH, with 94% deacetylation degree, in a solute-mixture of acetic acid (0.1 mol L^{-1}) and sodium chloride (0.2 mol L^{-1}) and sodium alginate (SA, with 62% M-units, in sodium chloride (0.1 mol L^{-1}), was performed at 25 ºC. Five different equations were applied to calculate intrinsic viscosity [η]: Huggins, Kraemer and Schulz-Blaschke (SB) by graphical extrapolation; Solomon-Ciuta, Deb-Chanterjee and again SB, by faster single-point determination. Viscometric constants were calculated employing graphical extrapolation equations. Average molar mass ($\overline{M}_v$) values were determined by applying the Mark-Houwink-Sakurada equation. For the samples analyzed, Huggins equation was the most suitable to calculate [η] and $\overline{M}_v$ by graphical extrapolation for chitosan, while Schulz-Blaschke and Solomon-Ciuta were adequate for single-point determinations of sodium alginate. Viscometric constants indicated that the aqueous mixture of acetic acid and sodium chloride is a poor solvent for chitosan, while sodium alginate is well solvated by aqueous sodium chloride.

Keywords: intrinsic viscosity; sodium alginate; chitosan; single-point equations; average molar mass