

Orientation order in polyelectrolyte solutions

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The question was raised if an orientation order could be observed in semi-flexible polyelectrolyte solutions [1-3]. Combined small angle X-ray and neutron scattering experiments recently performed on dense solutions of highly charged polyelectrolytes allow replying to this issue. Specifically, they reveal the existence of a nematic local order at high concentration [4] preceded by a new regime [5], both depending on the intrinsic stiffness of the macroion and the ionic strength of the solution. Three polyelectrolytes of distinct intrinsic stiffness will be considered: sodium poly(styrene sulfonate) (NaPSS); poly(diallyldimethyl ammonium chloride) (PDADMAC), and sodium hyaluronate (NaHA). Their related non electrostatic persistence length and effective charge fraction are, respectively: $l_p = 10, 30$ and 90 \AA ; $f_{\text{eff}} = 0.33, 0.66$ and 1 .

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