

Abstract Submitted  
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**Ionic Effect on Conformational Structure of Weak Polyelectrolyte in Dilute Solution: from Monovalent, Multivalent to Macro ions** CHEN QU, Univ of Notre Dame — The electrostatic environment near a charged polymer chain is critical to the structure and function of the polymer in aqueous media. In this work, we compare the effect of small monovalent and divalent ions and multivalent inorganic macroions on the conformational structure of weak polyelectrolyte, poly(2-vinyl pyridine) (P2VP), in dilute aqueous solutions by single molecule spectroscopy. Divalent counterions at low concentration range show the similar effect as monovalent ones to cause the shift of the critical pH for the coil-to-globule conformational transition of P2VP to the higher pH range. In contrast, divalent counterions at high concentration range and inorganic nanocluster anions cause the shift the critical transition pH to the opposite lower pH range. The measurement of local pH near a single P2VP chain indicates that adding counterions can effectively increase the protonation degree on the P2VP chain. Yet the electric potential of the P2PV is found to decrease upon addition of divalent ions and anionic macroions, suggesting enhanced counterion condensation by multivalent ions. It is also found that inorganic nanocluster macroion of 1 nm in diameter can form dense complexes with P2VP, whose dimension becomes independent of solution pH.

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