

Abstract Submitted
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Macroion Interaction at Polyelectrolyte Brush Interfaces CHEN

QU, Univ of Notre Dame — The effect of macroions, including synthetic polyelectrolytes, DNA and proteins, on the structure and surface properties of charged polymer thin films remains inadequately understood partially due to the complexity involving the hydrophobic effect and the conformational change of polymeric macroions. In this work, we explore a group of inorganic nanocluster based macroions, hydrophilic polyoxometalates (POMs) of robust nanocluster structure and carrying high surface charges ($\sim 2-42$ negative charges) to investigate their interaction with surface tethered poly-2-vinylpyridine (P2VP) brush-like thin films immersed in aqueous solution. We observe the collapse of swollen P2VP chains by adding POM macroions of increased concentration by AFM, QCM and contact goniometer measurements, in sharp contrast to the increased chain stretching by adding monovalent salts. A careful comparison is made between distinct POMs based on their charge, size and chemical nature. These findings serve as a good reference for theoretical model modification and design of new mesoporous composite membranes.

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