

Abstract Submitted
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Reversible Self-Assembly of Hydrophilic Inorganic Polyelectrolytes into Highly Conservative, Vesicle-like Structures MELISSA KISTLER, ANISH BHATT, GUANG LIU, TIANBO LIU, Dept. of Chemistry, Lehigh University, Bethlehem, PA — The hydrophilic polyoxometalate (POM) macroanions are inorganic polyelectrolytes which offer a direct connection between simple ions and organic polyelectrolytes. POM solutions are perfect model systems for studying polyelectrolyte solutions because they are identical in size, shape, mass and charges, with easily tunable charge density. Many types of POM macroanions are highly soluble but undergo reversible self-assembly to form uniform, stable, soft, single-layer vesicle-like “blackberry” structures containing >1000 individual POMs in dilute solutions. The driving force of the blackberry formation is likely counterion-mediated attraction (like-charge attraction). The blackberry size can be accurately controlled by solvent quality, or the charge density on macroions. Many unexpected phenomena have been observed in these novel systems. Blackberry structures may be analogous to virus shell structures formed by capsid proteins. References: Nature, 2003, 426, 59; JACS, 2002, 124, 10942; 2003, 125, 312; 2004, 126, 16690; 2005, 127, 6942; 2006, 128, 10103.

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