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Polyelectrolyte (PE) induced interactions between Charged and zwitterionic Colloids VICTOR PRYAMITSYN, VENKAT GANESAN, University of Texas at Austin — A numerical self-consistent field (SCF) theory approach was developed for studying mixture of polyelectrolytes with charged and uncharged nanoparticles. Such an approach was used to analyze within the mean-field limit the polyelectrolyte-mediated effective interactions between the particles. The system considered allows for the local PE and particle charges to be defined by the local concentration of ionizable on groups on the particles and polyelectrolytes, ambient conditions like pH and the local electrostatic potential. Calculation of the free energy of a system of one, two and three particles in the polyelectrolyte solution allowdd us to calculate the particle insertion free energy, two and three body particle-particle interactions as a function of the properties of solution, polymer-particle interactions and the particle size. For the situation involving acidic PE and a base type positively charged particles, the PE mediated particle-particle interaction is purely repulsive for the larger particle-particle distances at low polymer concentrations. At short-particle particle distances and/or higher polyelectrolyte concentrations the particle-particle interaction becomes a depletion-type attraction. For Zwitterionic positively chaged paticles particles we have found a a range

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