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Characterization of Size, Anisotropy, and Density Heterogeneity of Nanoparticles by Sedimentation Velocity BORRIES DEMELER, University of Texas Health Sciences Center San Antonio — A critical problem in materials science is the accurate characterization of the size dependent properties of colloidal inorganic nanocrystals. Due to the intrinsic polydispersity present during synthesis, dispersions of such materials exhibit simultaneous heterogeneity in density, molar mass, and particle diameter. The density increments with respect to diameter and molar mass of these nanoparticles, if known, can then provide important information about crystal growth and particle size distributions. For most classes of nanocrystals, a mixture of surfactants is added during synthesis to control their shape, size, and optical properties. However, it remains a challenge to accurately determine the amount of passivating ligand bound to the particle surface post synthesis. The presence of the ligand shell hampers an accurate determination of the nanocrystal diameter. Using CdSe and PbS nanocrystals, and the silver nanoparticle (M4Ag44(p-MBA)30), as model systems, we describe how appropriate parametrizations of the flow equation can be used to extract high resolution composition information for mixtures of solutes that are heterogeneous in two out of three hydrodynamic parameters when the third is known. We show how this approach can yield important detail to the understanding of solution composition.

Robert Whetten
University of Texas, San Antonio

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