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Reversible Rayleight-to-MIe Scattering Transition in a Core-Shell Colloidal System GUANGNAN MENG, Harvard University, ADELINE PERRO, VINOTHAN MANOHARAN — We present a study of light scattering from colloidal particles with small polystyrene cores and large shells of poly(*N*'-isopropylacrylamide-*co*-acrylic acid). When swollen in deionize water at room temperature, the shell is nearly index-matched to pure water, and the scattering is dominated by Rayleigh scattering from the polystyrene cores. As we change the solvent condition by increasing temperature or salt concentration, the shell starts to shrink and scatter light. Both the scattering cross section and the forward scattering of the particles increase, characteristic of Mie scatterers. We use optical microscopy, static light scattering and turbidimetry to study this optical transition. Such core-shell particles might be used as aqueous index-matched tracer colloids, as model scatterers for self-assembly studies, or as optical filters with tunable opacity.

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