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Single Chirality Resolution Separation of Single-Wall Carbon Nanotubes up to 1.7+ nm in Diameter using Aqueous Two-Phase Extraction JEFFREY FAGAN, National Institute of Standards and Technology — The recent development of aqueous two-phase extraction (ATPE) as a method for separating single-wall carbon nanotubes (SWCNTs) provides a scalable method for isolating many individual species of SWCNT via solution processing. In this presentation I will demonstrate that the ability of ATPE is not limited to the separation of small diameter SWCNTs $<$ 1nm, but enables the extraction of single metallic and semiconducting SWCNT species from plasma torch, laser ablation, electric arc and even large diameter CVD grown SWCNTs. The separation range of the technique thus extends to the isolation of individual species of nanotubes up to at least 1.7 nm in diameter, a dramatic improvement beyond previous SWCNT separation methods. Optical characterization of the refined populations, and analysis of the order of (n,m) extraction with respect to the mechanism underlying the ATPE method will be presented.

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