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Light Scattering Study of Elongated Particles *in situ*: From FeOOH Nanorice to Polypeptide Micelles PHILIP DEE, KIRIL STRELETZKY, Cleveland State University — Utilizing the powerful experimental technique of Dynamic Light Scattering (DLS) for size characterization of anisotropic particles can be extremely misleading. Unfortunately, this point is often not realized by researchers who strive for particle sizing of nanoparticles in suspensions. The first goal of this study was to highlight the ambiguities of the DLS experiment on elongated particles. The second goal was to demonstrate the power of Depolarized Dynamic Light Scattering (DDLS) in probing the anisotropy of different types of nanoparticles. Both goals were realized by studying two very different systems: inorganic FeOOH nanorice and elastin like polypeptide (ELP) micelles. The difference between the two systems is fundamental as FeOOH particles are solid, contain no water, and, therefore, are easily imaged using SEM, TEM, and AFM. Polypeptide micelles are soft particles filled with water, and, therefore, not easily imaged by abovementioned techniques. Perfecting DDLS on a system like FeOOH would allow less ambiguous interpretation of light scattering experiments on ELP micelles. We present a consistent analysis of DDLS results on FeOOH nanorice and outline the potential difficulties and challenges of DDLS application for polypeptide micelles.

Kiril Streletzky
Cleveland State University

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