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Solution-based high-energy SAXS measurements on metallic nanoparticles and photo-switchable lipid vesicles

Small-angle X-ray scattering (SAXS) is a valuable technique to investigate lipid membranes and engineered nanoparticles in solution. The X-ray energy is an important experimental parameter, which affects e.g. sample thickness, q-range, resolution, and radiation damage. Here, we use well-known test samples (Au nanoparticles and lipid vesicles) as benchmark to demonstrate that SAXS performed with an X-ray energy of 53 keV yields high quality data. Moreover, high-energy SAXS provides an excellent tool to investigate nanoparticles solved in highly absorbing solvents such as chloroform. Most importantly, we find that the X-ray energy is a key experimental parameter to prevent electrochemical effects of X-ray radiation on photo-switchable lipid membranes.

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