Liquid-Crystalline-Dendrimer-functionalized Gold Nanoparticles

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Liquid-crystalline (LC) dendrimers are capable to stabilize gold nanoparticles and can be introduced *via* a direct synthesis or a ligand exchange reaction with thiol-based dendrimers.(1) Alternatively, we developed a three-step method to bypass the dendrimer-thiol limiting step by preparing functionalized gold nanoparticles (AuNPs) from tailor-made dendrons.(2) Our study is based on (see Figure): 1) the formation of well-defined monolayer protected particles; 2) the functionalization of particles *via* ligand exchange reaction; 3) the further functionalization with chemically tethered LC-dendrimers.(3) Interestingly, an unexpected two-dimensional self-assembly at the nanoscale (see 4) on Figure) was observed as shown by our latest investigations with AuNPs covered by LC cyanobiphenyl-dendrimers.(2) LC-dendrimer-functionalized AuNPs are fascinating hybrid materials that combine the features of LC-dendrimers and the properties of metal nanoparticles to give rise to versatile building-blocks in nanofabrication. Mesomorphic properties of such LC AuNPs could lead to materials with temperature-dependant optical properties.

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