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Synthesis and investigations of mesogen encapsulated gold nanoparticles[1] CHIH-HAO YU, CHRIS J. WELCH, BAI J. TANG, CHRIS J. SCHUBERT, GEORG H. MEHL, Department of Chemistry, University of Hull, UK
— Nematic mesogen encapsulated gold nanoparticles with defined size and shapes are currently of great interest for a wide range of applications for electro-optical device or metamaterials. However the synthesis of most of the materials reported so far is quite cumbersome. Thus there is the need for new routes to synthesize more advanced compounds. A suitable strategy could be based on functionalizing the organic shell. In this contribution we report a new method to prepare gold nanoparticles with a bifunctional capping agent enabling control over their size and also act as a linking group for the connection with the mesogenic groups. The result showed monolayer coated gold nanoparticles without any co-ligands and lower the isotropic point. Physical and optical properties of the nematic gold nanoparticles have been characterized by HRTEM, EDS, NMR, DSC, TGA, XRD, and OPM. The results show stable nematic mesophase formation at room temperature. The investigate system displays a typical nematic schlieren texture, and a decreased viscosity when compared to other LC Au NPs. Structure properties relationships will be discussed and the materials will be compared to earlier research.

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