Low-Temperature Preparation of Tailored Carbon Nanostructures in Water


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Carbon nanostructures have found widespread interest in applications ranging from high performance composites, to fuel cells and electrode materials. Conventional synthetic pathways to such materials make it difficult to tailor their morphology or their surface chemistry. The authors now report a route to carbon nanostructures in aqueous solution at 1 °C. Oligo(ethynylene)-derived irradiation triggers carbonization. Carbon vesicles with a carbohydrate-decorated, graphite-like amorphous carbon membrane were obtained. This versatile strategy will allow the preparation of many functional carbon nano-structures for various applications.

Synergistic Effect of Palladium and Copper Catalysts: Catalytic Cyclizative Dimerization of ortho-(1-Alkynyl) benzamides Leading to Axially Chiral 1,3-Butadienes


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Synergistic catalysis can enable previously unknown transformations or improve the efficiency of existing reactions. In this context, the authors report on the dimerization of o-(1-alkynyl) benzamides in the presence Pd(OAc)₂ and Cu(OAc)₂ leading to chiral EE-1,3-diienes, a frequently appearing structural motif in natural products. The concurrent formation of vinylpalladium and vinylcopper species followed by transmetalation is key step in this transformation. The coexistence of both Pd and Cu catalysts was found to be essential for both the cyclizative dimerization process and for the observed unusual cyclization mode.

First Enantioseparation and Circular Dichroism Spectra of Au₃₈ Clusters Protected by Achiral Ligands


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Several forms of chirality are well known to chemists. One of these arises from the adsorption of achiral substrates on a surface. In this context, thiolate-decorated gold clusters were recently reported to be chiral. In this communication, Bürgi and coworkers present the synthesis and enantiomer separation of Au₃₈(SCH₂CH₂Ph)₃₈. The racemic nanoparticles were subjected to semi-preparative chiral HPLC, allowing the separation of the enantiomers. Importantly, the authors show that i) the chirality stems only from the asymmetric arrangement of the achiral sorbates on the nanoparticle and ii) the nanoparticles are configurationally stable for several days at -5 °C.