

When liquid crystals with a metal center are 'shaking hands'

March 14 2005

Without liquid crystals (LC's) our cell phones and notebook computers would not be possible, for these compounds keep our display screens flat and lightweight. Being a phase of matter whose order is intermediate between that of a liquid and that of a three-dimensionally organized crystal, LC's show special properties. For instance, by applying electric fields the molecular orientation and hence the optical properties of LC's can be controlled. In addition to the variety of interesting properties that LC's already display, chemists at the Jena University and the University of Colorado at Boulder have added new ones.

First of all, they used LC's containing a metal center of palladium or nickel. The rod-shaped organic LC moieties thus have a potentially active metal center, enabling them to do additional things such as perform catalytic reactions. Furthermore, special groups were added to the ends of molecules which are able to interact if exposed to high temperatures. The new LC's therefore form cross-linked network polymers in which their usual order is "frozen".

By combining their competencies, the scientists from Boulder and Jena have been able to design and synthesize the first samples of a new kind of metal-containing LC-polymer, which shows characteristics of LC's, polymers, and catalytically active compounds at once. "With these new metal-containing LC compounds new materials can be synthesized", says Prof. Dr. Wolfgang Weigand.

Original Publication: *Advanced Materials* 2005, 17, 602.

Citation: When liquid crystals with a metal center are 'shaking hands' (2005, March 14) retrieved 20 April 2024 from <https://phys.org/news/2005-03-liquid-crystals-metal-center.html>

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