

PRESS RELEASE – HANNOVER MESSE

18 MARCH 2019; SAARBRÜCKEN, HANOVER

Conductive metal-polymer inks for inkjet printing: flexible electronics without sintering

The INM – Leibniz Institute for New Materials presents hybrid inks for inkjet printing that contain metal nanoparticles coated with conductive polymers. The inks can be formulated in water and in other polar solvents and are suitable to print conductive structures on a range of substrates without any subsequent thermal or UV treatment. Standard metal inks require annealing after inkjet printing to become conductive. INM's new inks obviate this step, making them compatible with many substrates including thin polymer foils and paper.

The developers will demonstrate their hybrid inks at stand C54 in hall 5 at this year's Hannover Messe, which takes place from April 1 to 5.

Conductive inks are widely used in to print electronics. The inks presented by INM are applicable to flexible photovoltaics, lighting, touch screen electronics, wearable devices, large-area heaters, sensors, and 3D conformal antennas, among others. The inks are based on gold nanoparticles with good biocompatibility and low toxicity (FDA “generally regarded as safe”), suitable for health and biomedical applications.

“Immediate conductivity upon drying, mechanical flexibility, and good biocompatibility are important properties of our ink,” explains the INM materials scientist Tobias Kraus. “The hybrid inks contain a small organic polymer fraction that helps to maintain its electrical conductivity, even if the substrate material is bent,” Kraus continues. This enables printing on almost any substrate, like foil, paper, or textiles, since the final annealing steps at relatively high temperatures are avoided.

INM scientists have scaled the production of these hybrid inks to a level that is sufficient for small-scale production. “The scaling of nanostructured products requires optimized processes in order to maintain quality while lower prices,” says Kraus. Samples of the material are available for testing upon request.

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INM – Leibniz Institute for New Materials, situated in Saarbrücken, is an internationally leading centre for materials research. INM conducts research and development to create new materials – for today, tomorrow and beyond. Research at INM is performed in three fields: *Nanocomposite Technology*, *Interface Materials*, and *Bio Interfaces*. INM is an institute of the Leibniz Association and has about 260 employees.

