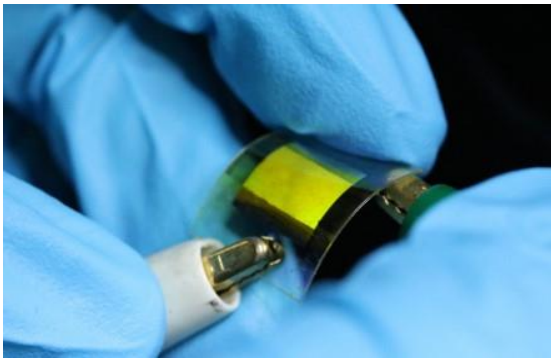
Scientific Highlight

Inkjet-printed electrodes in OLEDs

Researchers in the HySPRINT joint lab Generative Manufacturing Processes for Hybrid Components (GenFab) of Humboldt-Universität zu Berlin (HU) and Helmholtz-Zentrum Berlin (HZB) have successfully implemented an ink produced by the Berlin-based company OrelTech in solution-processed organic light emitting diodes.



The OLEDs incorporating the OrelTech ink illuminating under strain.

After inkjet printing the particle-free silver ink, an argon plasma is used to reduce the silver ions in the ink to metallic silver. "Because this process takes place at a low temperature, it is suitable for use with temperature-sensitive substrates, such as flexible plastic foils," explains Dr. Konstantin Livanov, co-founder and CTO of OrelTech. The researchers fabricated organic light-emitting diodes employing the silver ink as a transparent conductive electrode on the flexible substrate PET. The resulting devices show comparable light output characteristics to those based on the otherwise widely used indium tin oxide (ITO). Crucially, however, the silver electrodes showed superior stability to ITO upon mechanical bending. Dr. Felix Hermerschmidt, senior researcher in the joint lab of HU and HZB, confirms, "The OLEDs based on the OrelTech ink remain intact at a bending radius at which the OLEDs based on ITO show breakage and fail." This opens up several application opportunities of the printed devices. The work has been published in the journal Flexible and Printed Electronics and is available Open Access. GenFab, led by Prof. List-Kratochvil, who is a memnber of **IRIS Adlershof**, is moving into laboratories and offices in the new IRIS research building for further research and development work.

ITO-free OLEDs utilizing inkjet-printed and low temperature plasma-sintered Ag electrodes

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