

News Release



New semiconductor inks for printed electronics in LCD and OLED displays

- **New product generation increases the performance of printed transistors**
- **Improved materials for use in flexible displays**

Printed electronic circuits will become more efficient in future with new semiconductor inks from BASF. Researchers at BASF have succeeded in improving the composition of the individual semiconductor ink components to double the mobility of the charge carriers in the printed circuits. This allows to further reduce the structures in size and to produce high resolution LCD or OLED screens on plastic substrates.

"Because of their technical properties, the semiconductor inks we have offered so far have already proved successful in our customers' applications," explains Dr. Heike Pfistner, Marketing Organic Electronics at BASF New Business GmbH. "We are continuously optimizing the products from our portfolio and can now offer printable semiconductors with significantly better performance and with the usual good processability." The mobility of the charge carriers is an important criterion and is decisive for the use of the semiconductor inks in a range of applications.

Inks with versatile uses

The printing inks are based on semiconducting polymers featuring good solubility allowing easy adjustment of viscosity. This property is

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important for the use in various coating and printing processes, such as large-area processing (e.g. slot die coating).

Electronics are easily printed

A digital photo and thus also a display consists of picture elements (pixels). To present an image or a film on a display, the pixels are controlled individually via the backplane. Today the backplane is produced by complex, energy-intensive processes at high temperatures under vacuum. This limits the choice of substrate materials to e.g. glass and high-temperature stable polymers.

The printable semiconductor inks and new process technologies open up a range of options in this respect. For example, new, flexible substrate materials can be used. The printing processes are typically operated in air and at low temperatures. The combination of printability and high mobility will enable all conventional display technologies (ePaper, LCD, OLED) to be equipped with printed backplanes. This makes flexible displays easier to manufacture. Further applications include circuits and memories for intelligent packaging through which the consumer can, for example, obtain additional information about the packaged products, as well as portable electronics (wearables) such as fitness wristbands or smartwatches.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 112,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of more than €70 billion in 2015. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information at www.basf.com.