

New technology will allow for flexible television and computer screens

Organic light emitting diodes (OLED) are the technology used in making light emitting fabrics used in cell phones and televisions. The fabrication of flexible OLEDs has up to now been held back by the fragility of the brittle indium tin oxide layer that serves as the transparent electrode. But researchers at the Regroupement Québécois sur les Matériaux de Pointe (RQMP) have found a solution which they published in the May online issue of *Applied Physics Letters*.

"Organic light emitting diodes have in recent years emerged as a promising low cost technology for making large area flat panel displays and flexible light emitting fabrics," explains Richard Martel, professor at the Université de Montréal's chemistry department. "By using carbon nanotubes, a highly conductive and flexible tube shaped carbon nanostructure, thin sheets a few tens of nanometers in thickness can be fabricated following a procedure akin to making paper. These sheets preserve the conductivity and flexibility of the carbon nanotubes and are thin enough to be highly transparent."

By following the fabrication procedure they developed, the researchers succeeded in producing a high-performance OLED on this new electrode material. In their work they also outline the parameters that can be further optimized in order improve the performance of their design. "In addition to their flexibility, carbon nanotube sheets exhibit a number of properties that make them an attractive alternative to transparent conducting oxides for display and lighting applications," says Carla Aguirre, a researcher at the École Polytechnique affiliated with the Université de Montréal. "By applying the appropriate chemical treatment they can in principle be also made to replace the metal electrode in order to make OLEDs that emit light from both sides."

The potential market applications of this technology are many. From rolled-up computer screens to light emitting clothes, this technology will find many uses.

The research Group included: Carla Aguirre and Patrick Desjardins from École Polytechnique, Stéphane Auvray and Richard Martel from Université de Montréal, S. Pigeon from OLA Display Corporation and R. Izquierdo from Université du Québec à Montréal.

Source: University of Montreal

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