dion-like honeycomb scaffolds have the potential to overcome the major challenges with structural and mechanical integrity of scaffolds for myocardial tissue engineering by closely mimicking the anisotropic mechanical properties of adult rat right ventricular myocardium, while simultaneously promoting the preferential orientation of cultured neonatal heart cells in absence of external stimuli.

ROHIT KHANNA

Air-Stable ZnO Cathode Enables White Light-Emitting HyLEDs

Organic light-emitting diode (OLED) technology has become increasingly popular due to its potential for energy efficient alternate lighting sources. OLED displays function without the assistance of a backlight, which allows them to use much less power and provides longer performance lifetimes in comparison to their liquid-crystal display (LCD) alternatives. OLEDs depend on a multilayered structural design, and can ultimately be used to produce very thin displays which are highly desirable consumer features. However, the vacuum deposition methods used to fabricate the multilayer structures can be cost prohibitive, and the final product can degrade upon exposure to oxygen and humidity. Solution processable OLEDs using inorganic materials like ZnO as injection layers address these challenges in that they have the potential for improved lifetimes and can incorporate materials that make them more cost efficient to produce. In the February 10 issue of *Chemistry of Materials* (DOI: 10.1021/ cm8031362; p. 439), H.J. Bolink, E. Coronado, and M. Sessolo from the Universidad de Valencia, Spain report on a white hybrid organic–inorganic light-emitting diode (HyLED) using air-stable ZnO as the cathode in the fabrication of an electroluminescence device. By efficiently overcoming the electron injection barrier, white light-emitting HyLEDs offer the promise for less rigorous encapsulation which makes them especially suited for low-cost lighting applications.

As reported by the researchers, 80-nm thick ZnO layers were deposited on an indium-tin-oxide–coated glass substrate by spray pyrolysis. A blue polymer matrix emitting host, poly(9,9-dioctylfluorenyl-2,7-diyl), was doped with an iridium-(III)bis (2-methyldibenzo-[f,h] quinoxaline) (acetylacetonate) ($Ir(MDQ)_2(acac)$) complex as orange dye, and dissolved in chlorobenzene. The iridium complex is an efficient emitter in hole-dominated charge transporting environments and has previously been employed in multilayer white OLEDs. Decreasing the concentration of the Ir complex reduces the orange phosphorescence as the blue fluorescent component increases. Most significantly, decreasing the complex concentration from 0.5% weight-in-weight (w/w) to 0.02% w/w induces an emission broadening and hence a color change from orange to white.

The basic design rules used for OLEDs are applied toward HyLEDs in this study to illustrate how transition metal oxides can function as charge transport and, particularly, electron injection layers in HyLEDs. This demonstrates the possibility to prepare air-stable white electroluminescent devices and consequently enhances the feasibility of HyLEDs as real competitors to OLED electronic device technology.

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