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Spray deposited ZnO scattering layers for OLED applications

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White organic light-emitting diodes (WOLEDs) hold high potential for room lighting, display technology and beyond. By using specific phosphors the internal quantum efficiency of OLEDs reaches values close to 1 but the overall efficiency is still reduced by insufficient photon extraction. A common way to overcome this lack of efficiency is the insertion of scattering centers to the device. Among the different material systems, nanostructured metal oxide layer holds high potential because of their high stability and their high refractive index. In this work zinc acetate dihydrate was used in combination with a structure giving diblock copolymer template and sol-gel chemistry to obtain a processable solution for ZnO deposition. To achieve a reasonable film thickness the produced solution was deposited on glass substrates by spray coating. The film morphology as probed by x-ray scattering techniques and SEM is related to the spectral response to gain a structure-function relationship.

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