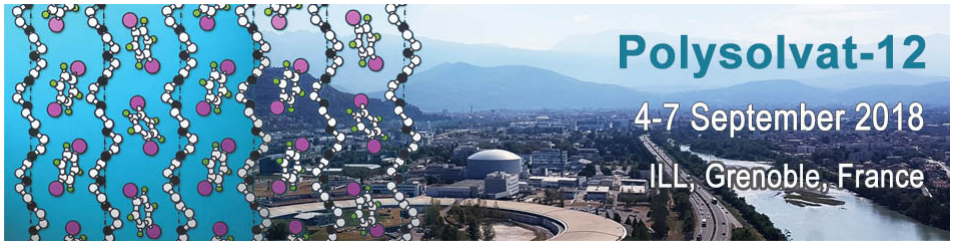

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Transparent moisture barrier using surface-modified nanoclay composite for OLED encapsulation

We report the facile fabrication of transparent and high-performance moisture barrier material (SC nanocomposite) using surface-modified bentonite clay (SC) as nanofiller and glycidyl silane as a surface-modifier/binder via simple, cost-effective and mass-producible process. SC is synthesised using a base-catalysed sol-gel process; their hydroxyl surfaces are decorated with glycidyl ligands to endure the densely stacked structure and high clay content in the final nanocomposite. The SC nanocomposite barrier exhibits high optical transparency (> 90), dense multi-stacked clay structure, and considerably enhanced moisture barrier performance. We discuss the fabrication and physical properties of the SC nanocomposite. To assess the applicability of the nanocomposite as a high-performance barrier material in practical applications, typical organic light-emitting devices are encapsulated, and their lifetime is evaluated.

Preferred topic

Industrial applications

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