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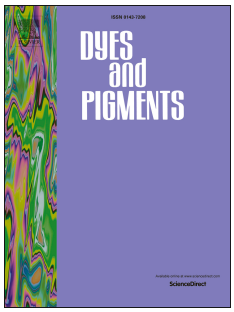

Development of bright and low angle dependence structural colors from order-disorder hierarchical photonic structure

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Development of bright and low angle dependence structural colors from order-disorder hierarchical photonic structure

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Abstract

Structural colors derived from photonic crystals are usually bright and iridescent. But the angle dependence property of structural colors greatly restricts their application in some fields such as displays and sensors. Meantime, the non-iridescent structural colors from amorphous photonic structures are pale and faded. In this work, an order-disorder hierarchical photonic structure (HPS) film material was fabricated by a single step co-assembly of polyurethane dispersions (PUD) and polydopamine coated polystyrene nanoparticles (PS@PDA NPs) owing to the strong Brownian motion under a heating condition. This hierarchical photonic structure material displays bright and low angle dependence structural color. The SEM images confirm the order-disorder hierarchical photonic structure of as-prepared films.