

The investigation of bio-inspired structural color using synchrotron techniques

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Abstract

This study aims to mimic the amorphous photonic structure inspired by the non-iridescent structural color from the feather of hyacinth macaw. The small angle X-ray scattering (SAXS) pattern exhibits an isotropic feature that reveals the isotropy and short-range spatial periodicity of the amorphous photonic structure. Furthermore, the transmission X-ray microscopy (TXM) result indicates a notable structural evolution from order structure on the feather surface to disorder structure in the interior feather. We successfully utilize the hybrid material of the monodisperse polystyrene (PS) colloidal with diameter of 200 nm and PEDOT:PSS to develop a non-iridescent structural color.

Keywords –*Amorphous photonic structure, Small angle X-ray scattering, Transmission X-ray microscopy.*