Supplementary Information (SI) for Journal of Materials Chemistry C.

Angle-Tunable Polymeric Photonic Diode with 1D-Photonic Crystal for Enhanced Light Control

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S1. The UV-visible absorption spectrum of Au@C Nanostructures

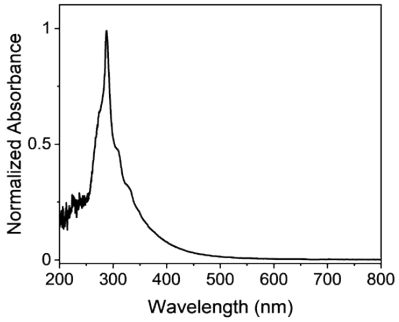

Figure S1 UV-Visible absorption spectrum of Au@C prepared in chlorobenzene by pulsed laser ablation technique

The linear absorption spectrum of the Au@C exhibits a single peak at 280 nm, followed by complete transparency throughout the visible and near-infrared regions (Fig. S1). This absence of the characteristic surface plasmon resonance (SPR) band of Au nanoparticles confirms their successful surface passivation. In core-shell geometries, the encapsulating shell effectively hinders electromagnetic interaction with the encapsulated core, leading to the suppression of the expected SPR band.

S2. Angle-resolved transmission spectroscopy of the PhC structure

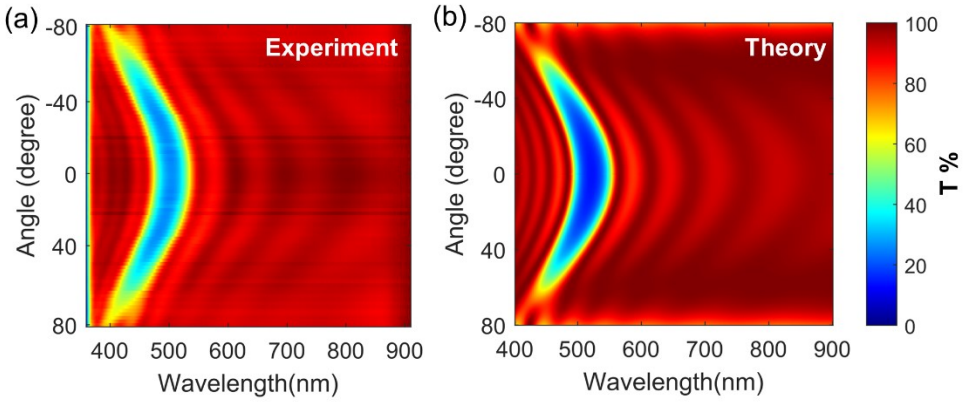

Figure S2. Transmission colormap of PhC under TM-polarized light for different angle of incidence (a) experimental (b) simulated

To quantify the angular dispersion characteristics of the PhC, we measured the transmittance spectra at various incident angles and compared them with the simulated results (Fig. S2). The

measured data demonstrates a consistent blue shift of the photonic bandgap (PBG) with increasing incident angle for TM-polarized light.

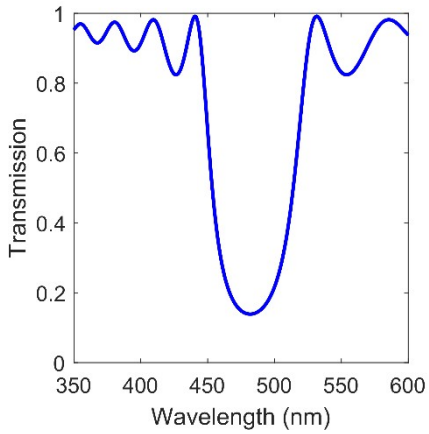

Figure S3 Normal incidence transmission spectrum of a 10-bilayer PVK/CA multilayer structure simulated using the transfer matrix method.

Normal-incidence transmittance spectrum of a ten-bilayer poly(vinyl carbazole) (PVK)/cellulose acetate (CA) multilayer thin film calculated using the transfer matrix method and given in Fig. S3.