Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

The effect of plasmon resonance coupling in P3HT-coated silver nanodisk monolayers on their optical sensitivity

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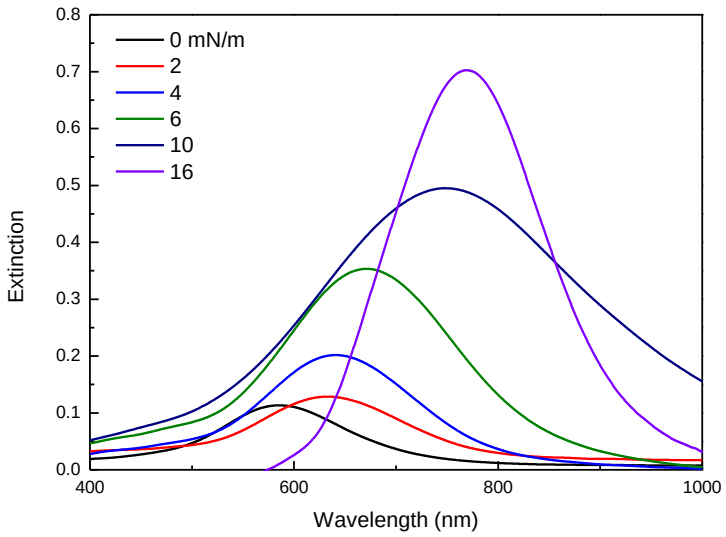

Fig. S1. UV-Vis spectra of Ag ND monolayers deposited in an LB-compressed manner on ITO substrates.

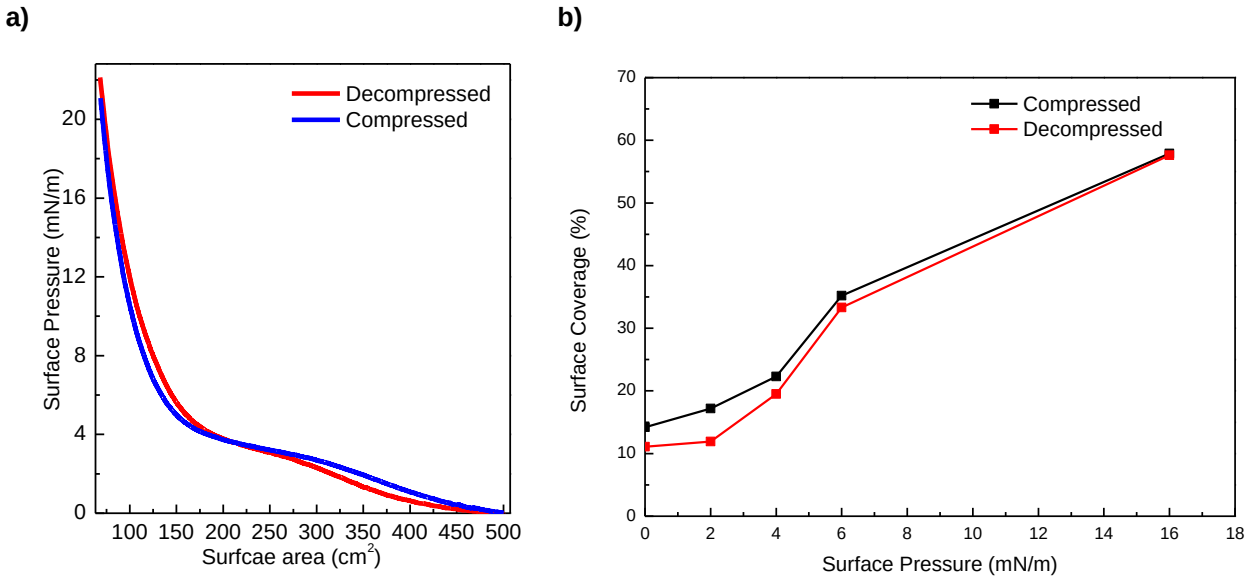

Fig. S2. a) The LB isotherms for Ag ND monolayers deposited using compressed and decompressed deposition methods. The variation between the two curves indicates a slight hysteresis effect. b) The surface coverage of the Ag ND monolayers as a function of LB surface pressure deposition for both compressed and decompressed deposition.

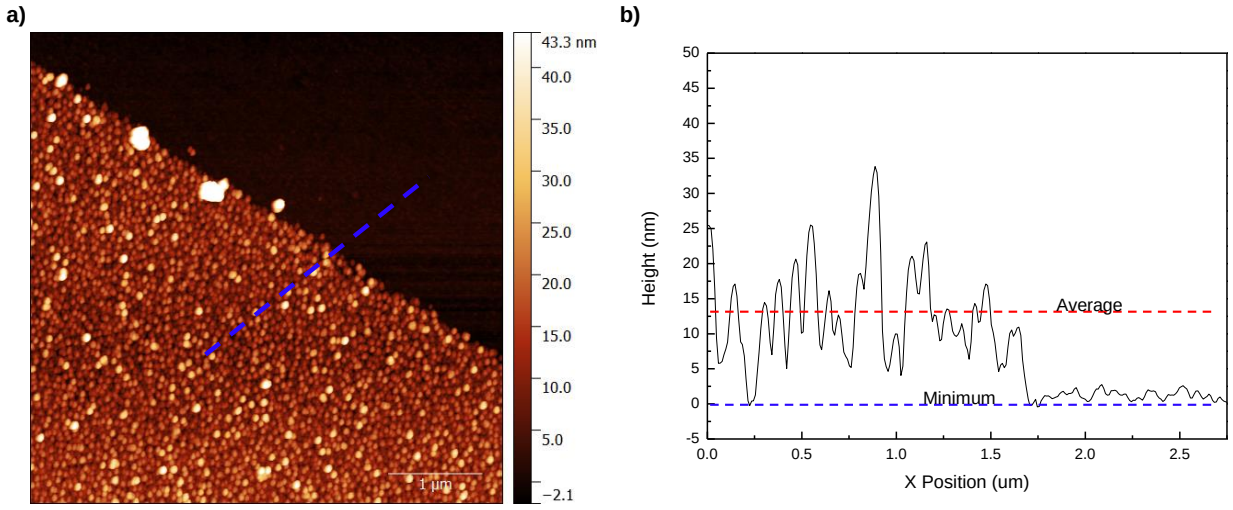

Fig. S3. a) A scratched Ag ND monolayer for thickness measurements. b) Cross-section showing the same minimum height in the monolayer and in the scratch, confirming that there is no underlying polymer layer present in the monolayer.

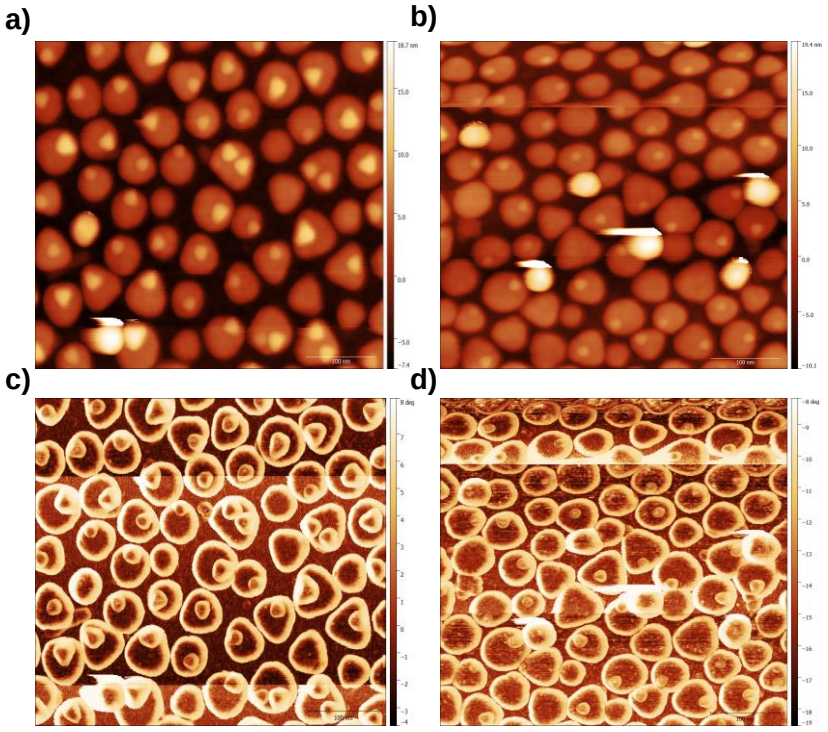

Fig. S4. AFM topographical images of a) compressed and b) decompressed Ag ND monolayers deposited at 6 mN/m. Very few micelles, visible as the elevated spots, are present for both samples. c) Corresponding phase image for a). d) Corresponding phase image for b).

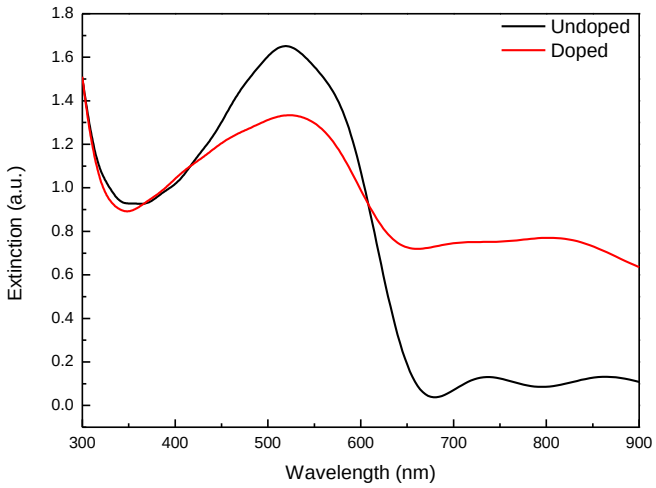

Fig. S5. FDTD-simulated spectra of undoped and iodine-doped P3HT films based on refractive indices obtained from literature.

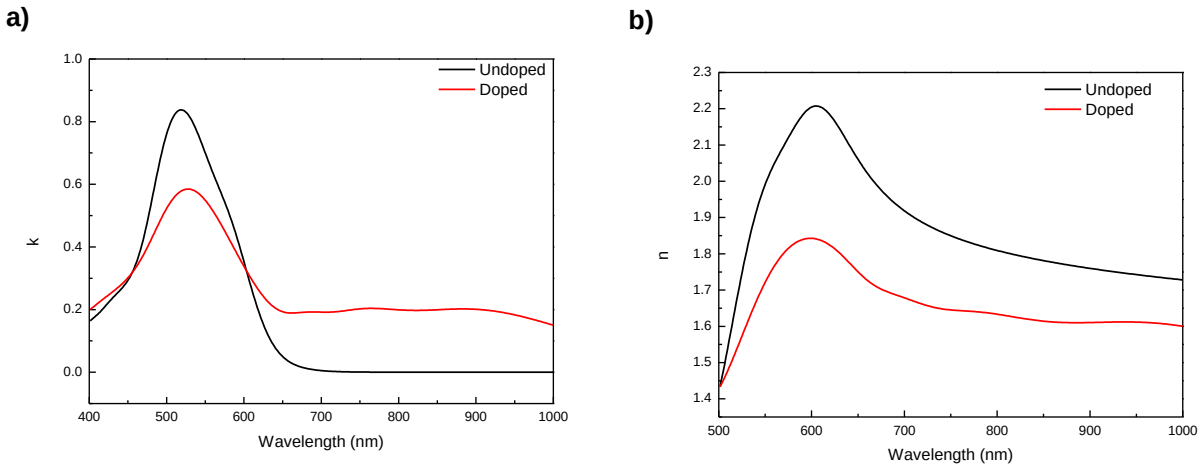

Fig. S6. a) Ellipsometry-derived *k* values for undoped and partially doped P3HT films. The ellipsometry-derived absorption is a closer match to the experimental results (Fig. 8a) than the absorption values obtained from literature refractive indices (Fig. S5). b) The real refractive index, *n*, for undoped and partially doped P3HT films used to calculate Δn (Fig. 8b).

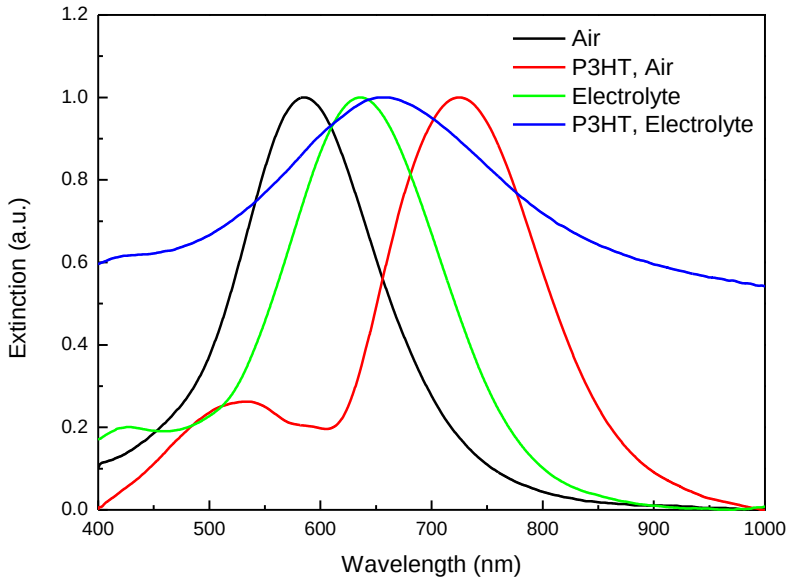

Fig. S7: UV-Vis spectra of an Ag ND monolayer deposited at 0 mN/m with and without a P3HT coating in air and electrolyte environments. Broadening of the P3HT, electrolyte spectrum is attributed to a lower signal and higher background from the electrochemical cell setup.

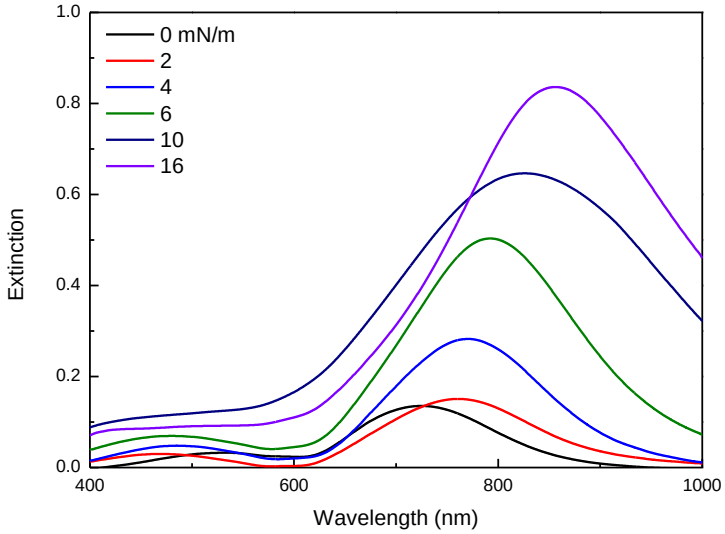

Fig. S8. UV-Vis spectra of P3HT-coated Ag ND monolayers deposited using LB compression.

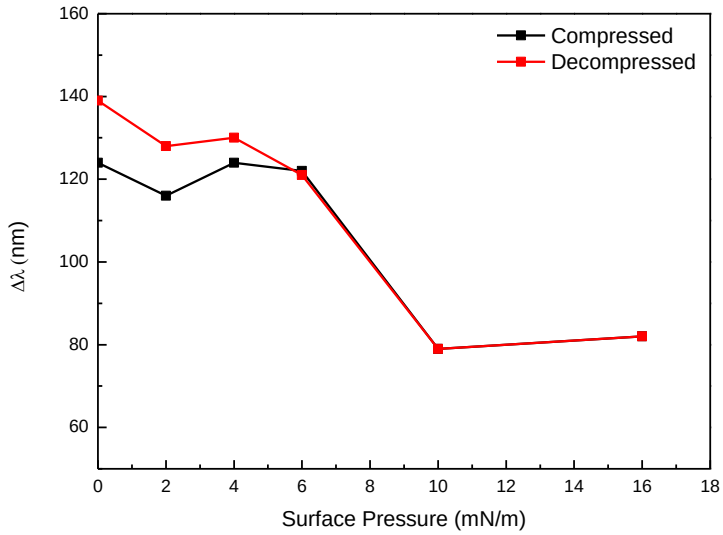

Fig. S9. Red shift of the Ag ND monolayer LSPR peak after P3HT deposition for both compression (black) and decompression (red) methods.

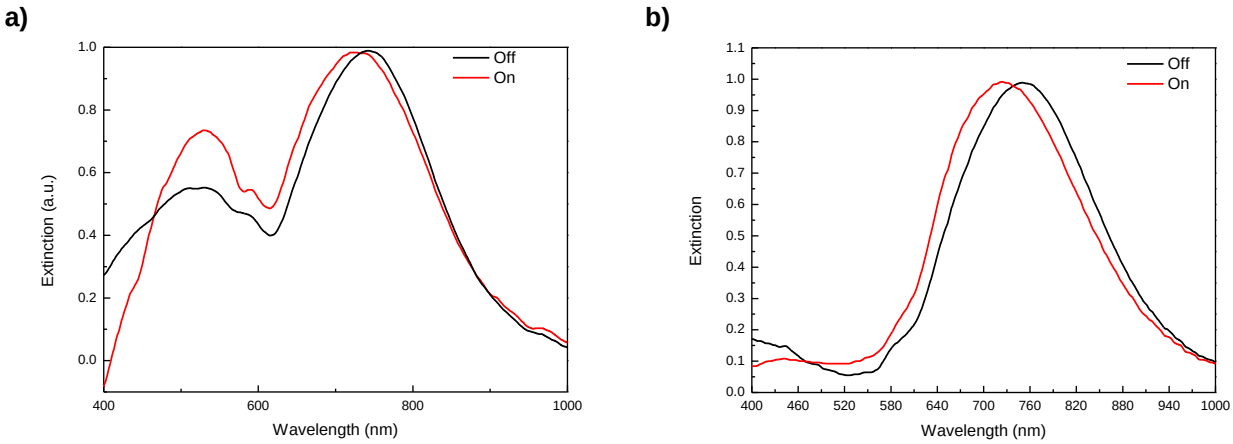

Fig. S10. a) One switching cycle for a compressed 4 mN/m P3HT-coated Ag ND monolayer showing a 13 nm LSPR shift. The peak at 500 nm is due to P3HT absorption. b) One switching cycle for a decompressed 4 mN/m P3HT-coated Ag ND monolayer showing a 26 nm LSPR shift.

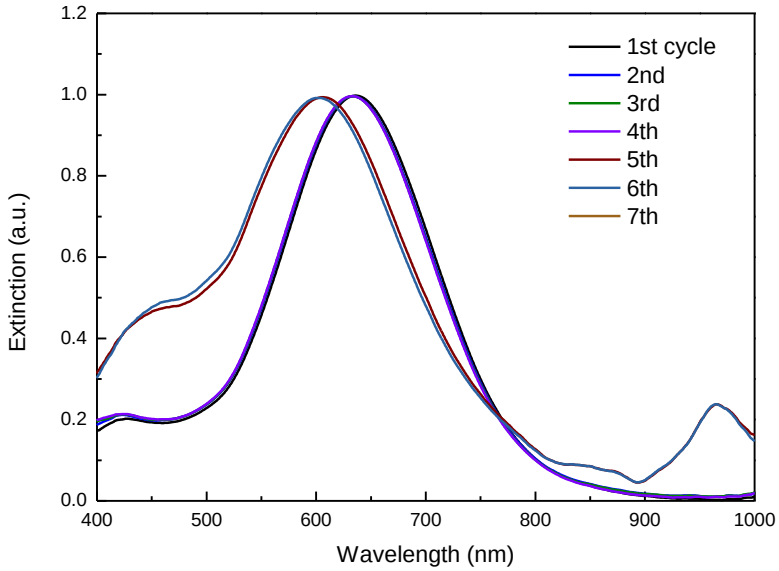

Fig. S11. Electropotential cycles of a bare Ag ND monolayer without a P3HT coating.