

Supplementary information

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PMMA/TiO₂ Nanocomposite Derived Selective Surface Coatings for Improved Optical Properties with Cold Plasma Assisted

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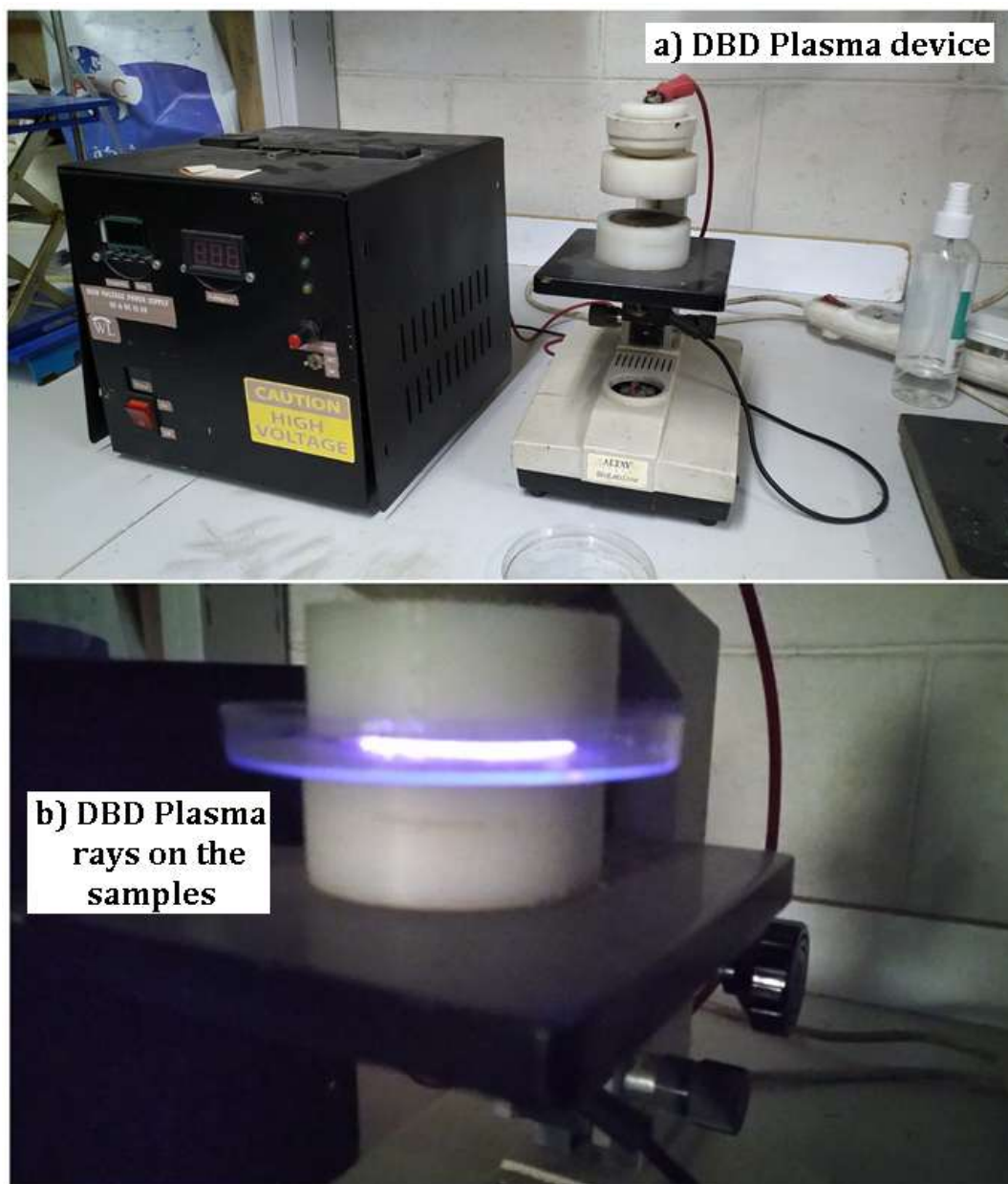
Supplementary Fig. 1a: XRD device utilized to inspect the structure of the nanocomposite films PMMA/TiO₂, the diffraction angle (2θ) ranged from 10° to 80° to exhibit the film's structure crystalline or amorphous.



Supplementary Fig. 1b: Diffusive reflectance utilized to inspect the PMMA/TiO₂ films



Supplementary Fig. 2: AFM (AA2000) to illustrate the surface roughness of PMMA/TiO₂ thin films



Supplementary Fig. 3 (a and b): Cold plasma DBD device utilized to strike the sample by a plasma ray in its chamber

Supplementary Table 1. The compositions of the samples for blank PMMA and PMMA/TiO₂ nanocomposite thin films

No.	Sample	TiO ₂ (% wt.)	PMMA (g)
1	blank PMM	0	1.5
2	PMMA+1% TiO ₂	1	1.5
3	PMMA +2% TiO ₂	2	1.5
4	PMMA +3% TiO ₂	3	1.5

Supplementary Table 2. DBD plasma parameters result for AC applied voltage of (10) kV

High Voltage (kV)	T_e (eV)	$\Delta\lambda_{FWHM}$ (nm)	$n_e * 10^{18}$ (cm ⁻³)	$f_p * 10^{13}$ (Hz)	$\lambda_D * 10^{-5}$ (cm)
10	1.624	6.89	5.0291	20.138	21.240

Supplementary Table 4. Roughness values of PMMA/TiO₂ nanocomposite films

No.	Composite	Figure's number	Roughness average (SR) (nm)	Root mean square (RMS) (nm)
1	PMMA blank	7-a	0.828	1.6
2	PMMA+1 % TiO ₂	7-b	2.34	3.52
3	PMMA+2 % TiO ₂	7-c	2.71	3.54
4	PMMA+3 % TiO ₂	7-d	3.04	4.97