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SUPPORTING INFORMATION

Visible-light Activated ROS Generator Multilayer Film for Antibacterial Coatings

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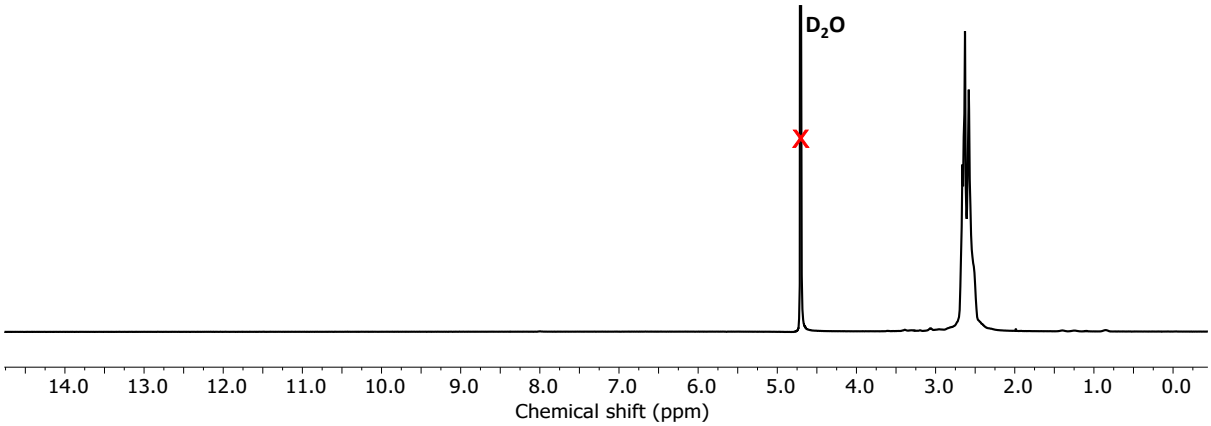

Fig. S1 ^{1}H NMR spectrum of PEI in D_2O.

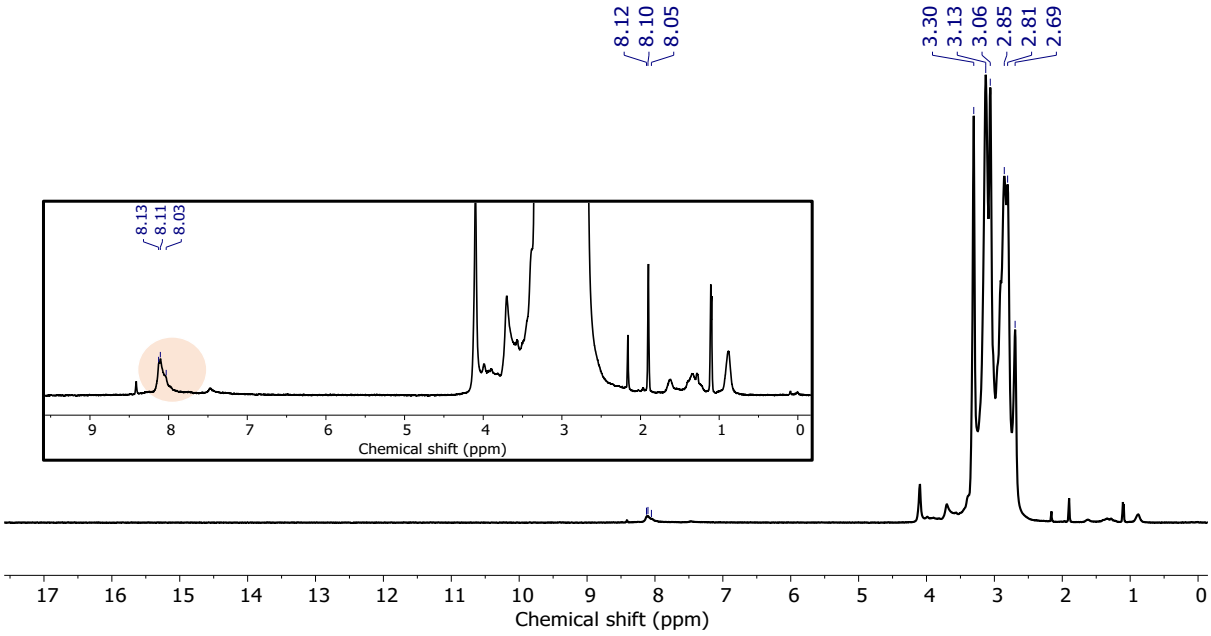

Fig. S2 ^{1}H NMR spectrum of **PEI-BF_2** in D_2O.

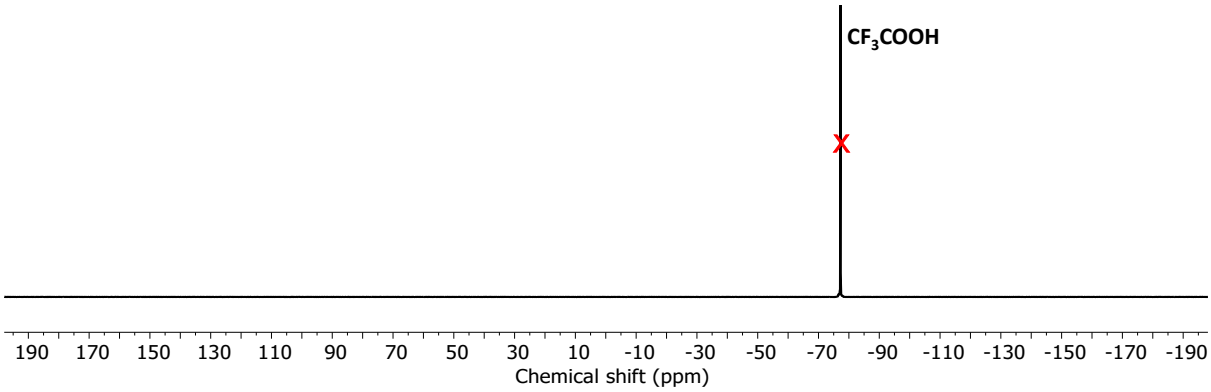

Fig. S3 ^{19}F NMR spectrum of PEI in D_2O.

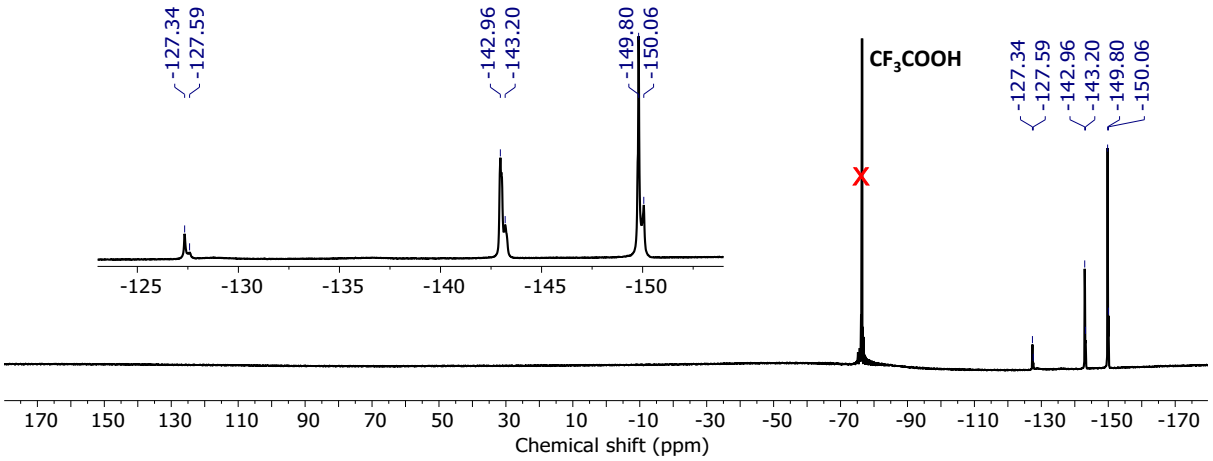

Fig. S4 ^{19}F NMR spectrum of **PEI-BF_2** in D_2O.

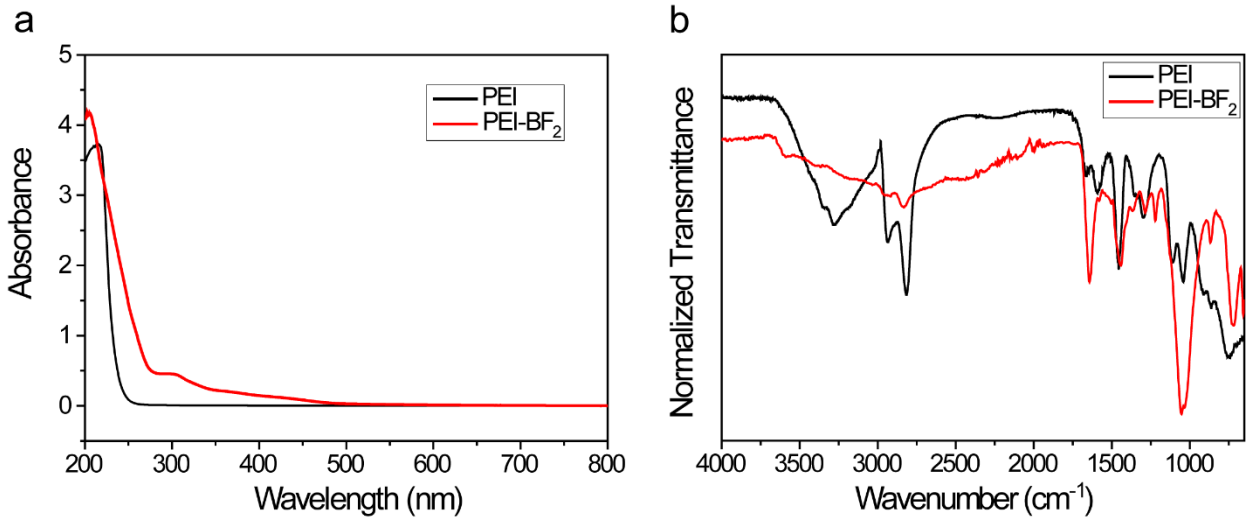

Fig. S5 (a) Absorption spectra of PEI and **PEI-BF_2** and (b) FT-IR spectra of **PEI-BF_2**

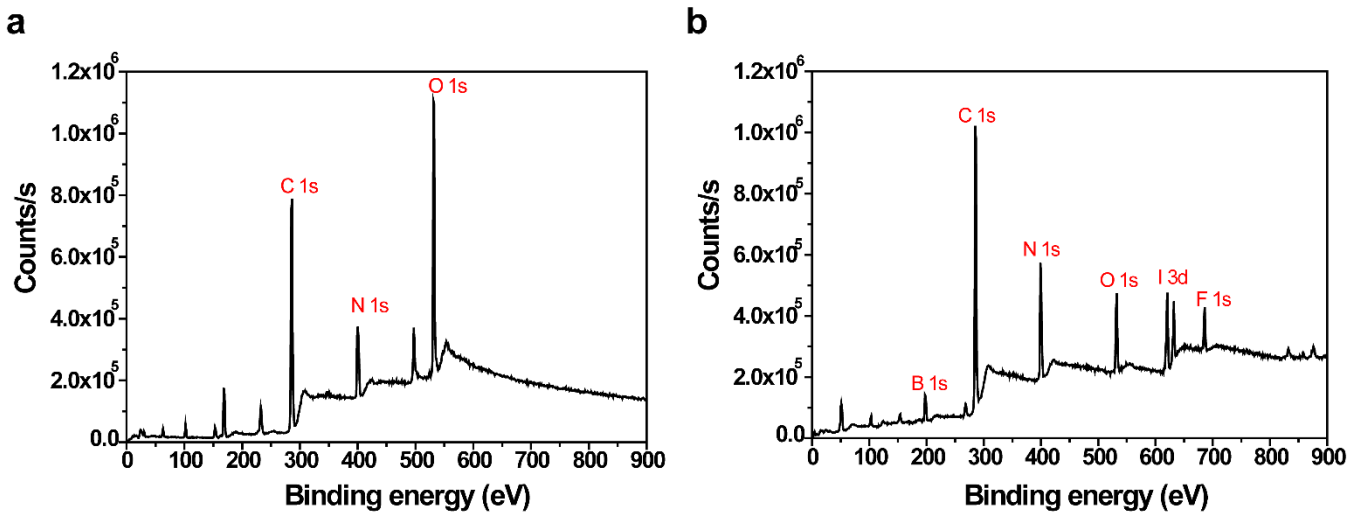

Fig. S6 XPS survey scan spectra for (a) branched PEI (b**) PEI-BF_2** demonstrating presence of all key elements

Table 1. Binding energies and estimated composition from XPS data

	Binding Energy (Start), eV	Binding Energy (End), eV	Atomic % (i)	Atomic % (ii)	Atomic % (iii)	Mean	Standard deviation
B 1s	210	180	2.36	2.12	2.84	2.44	0.3
F1s	698	680.29	2.09	2.73	2.3	2.37	0.3
I 3d	640	612.52	0.28	1.24	0.86	0.80	0.5

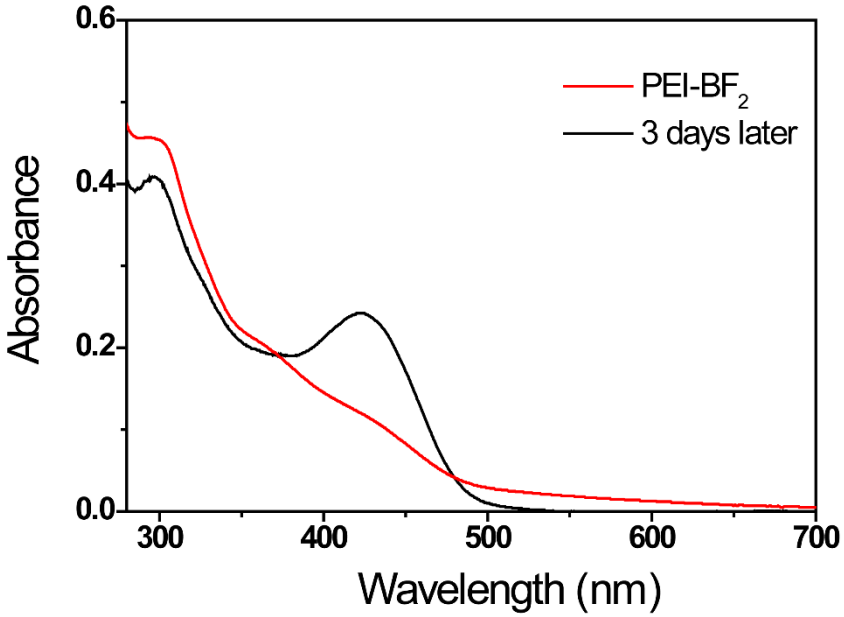

Fig. S7 Change in the UV-Vis absorption spectrum of **PEI-BF_2** in water under ambient conditions upon ageing.

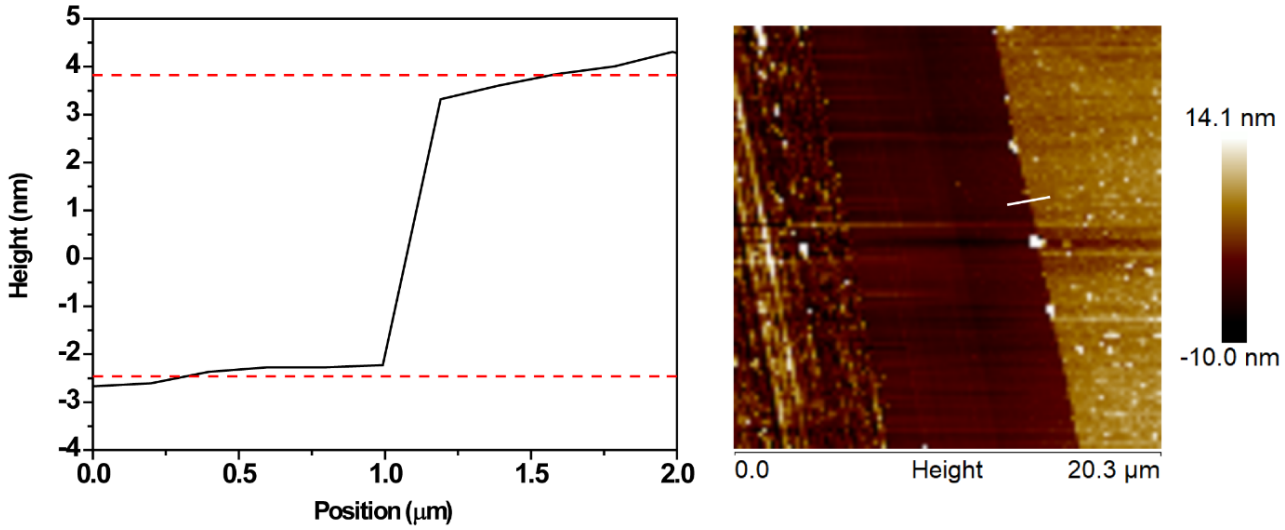

Fig. S8 The thickness measurement of 1BL **PEI-BF_2**/PAA by AFM.

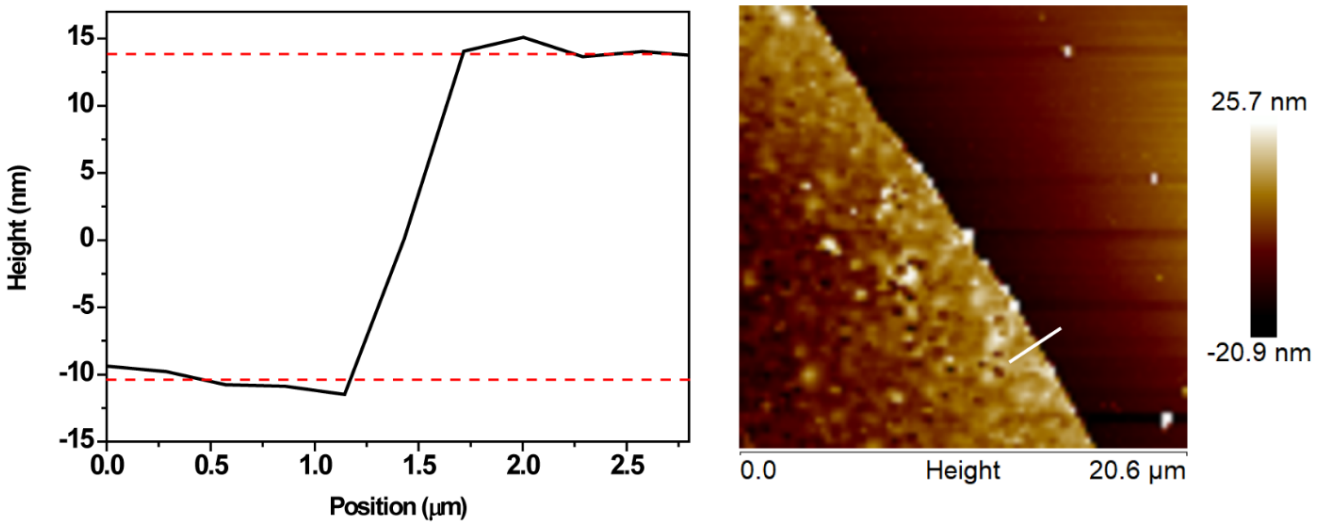

Fig. S9 The thickness measurement of 3BLs **PEI-BF_2**/PAA by AFM.

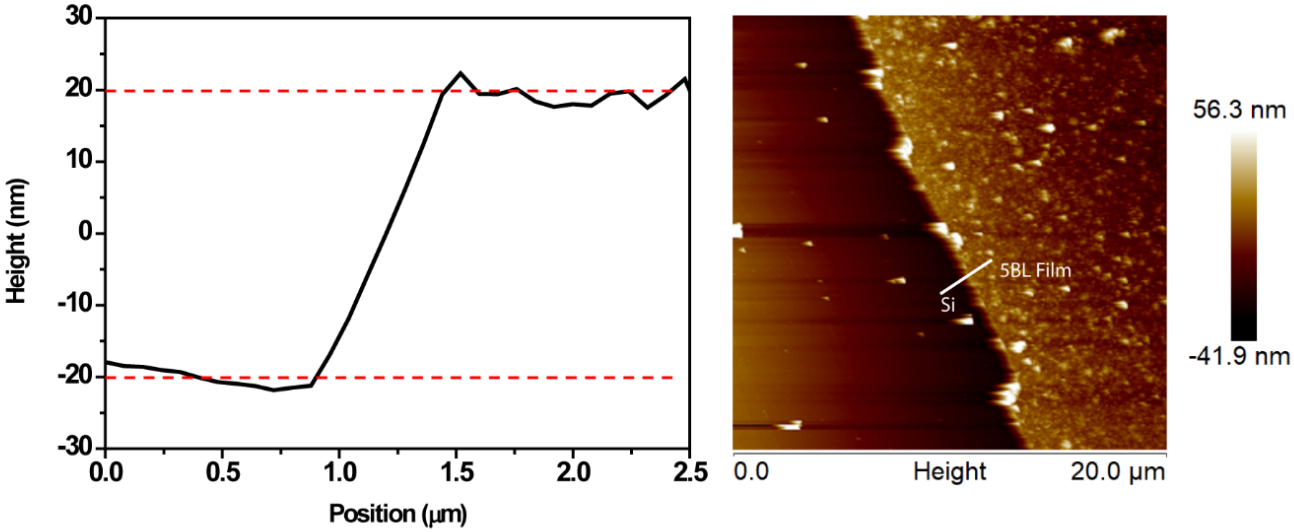

Fig. S10 The thickness measurement of 5BLs **PEI-BF_2**/PAA by AFM.

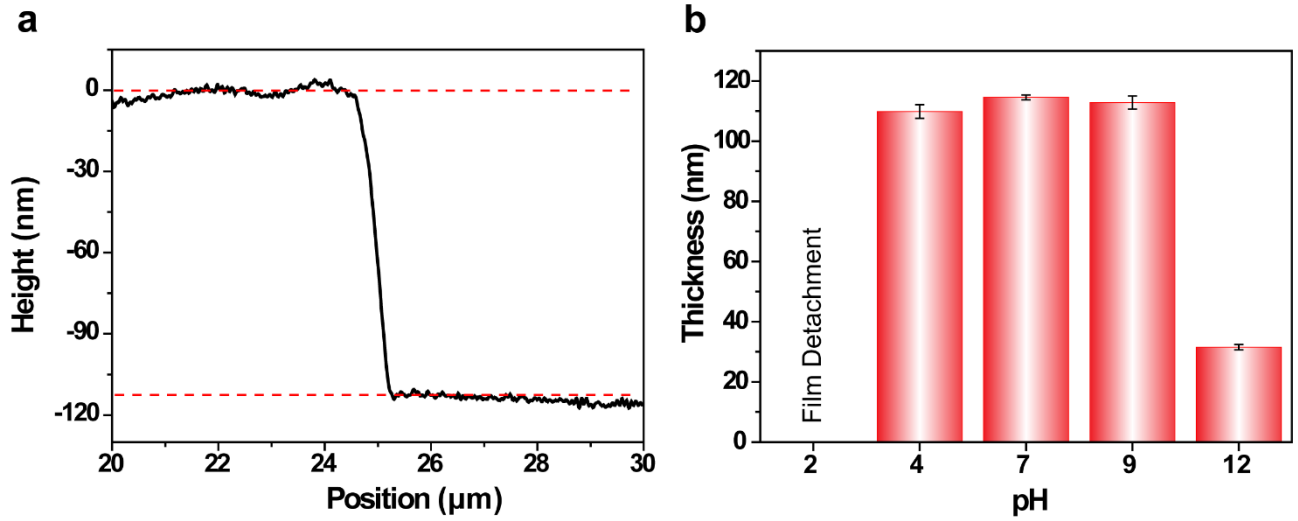

Fig. S11 (a)The thickness measurement of 10BLs **PEI-BF_2**/PAA by surface profilometry as measured after exposing the sample to UV and visible light for 3-4 days. (b) Stability of the 10BLs **PEI-BF_2** /PAA film at different pH.

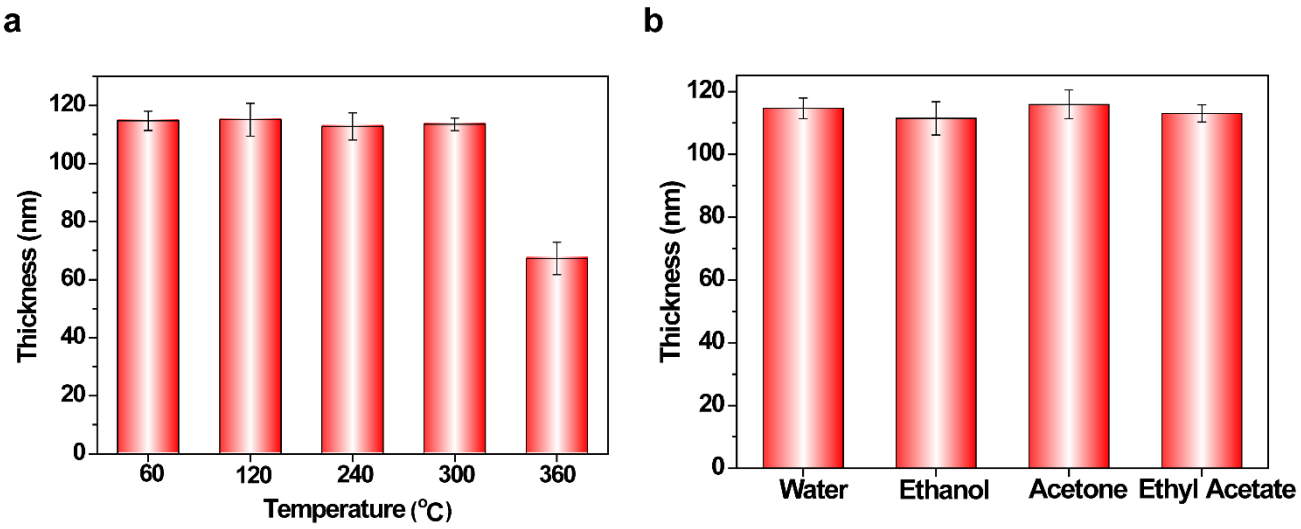

Fig. S12 (a) Stability of the 10BLs **PEI-BF_2**/PAA film at different temperatures (thickness of the film remains same till 300 ^{0}C) and (b) in different organic solvents.

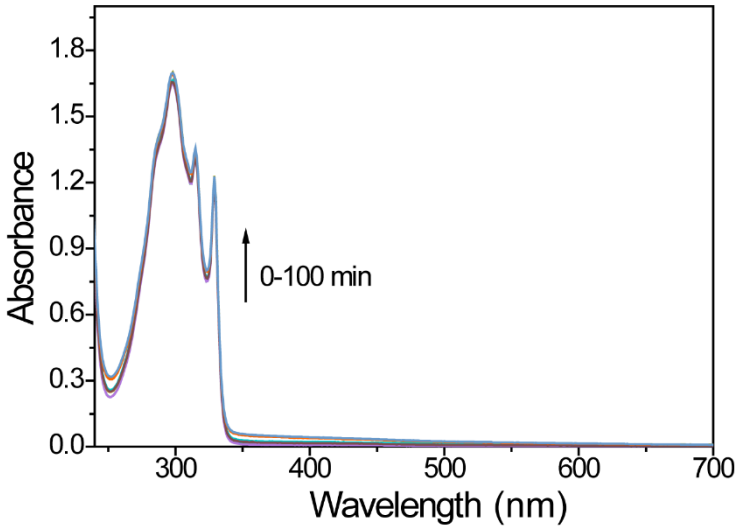

Fig. S13 The UV-Vis absorption spectrum of an aqueous solution of 1,5- dihydroxynaphthalene (DHN) for 10BLs coated PEI/PAA vial showing negligible change on exposure to UV-Visible light.

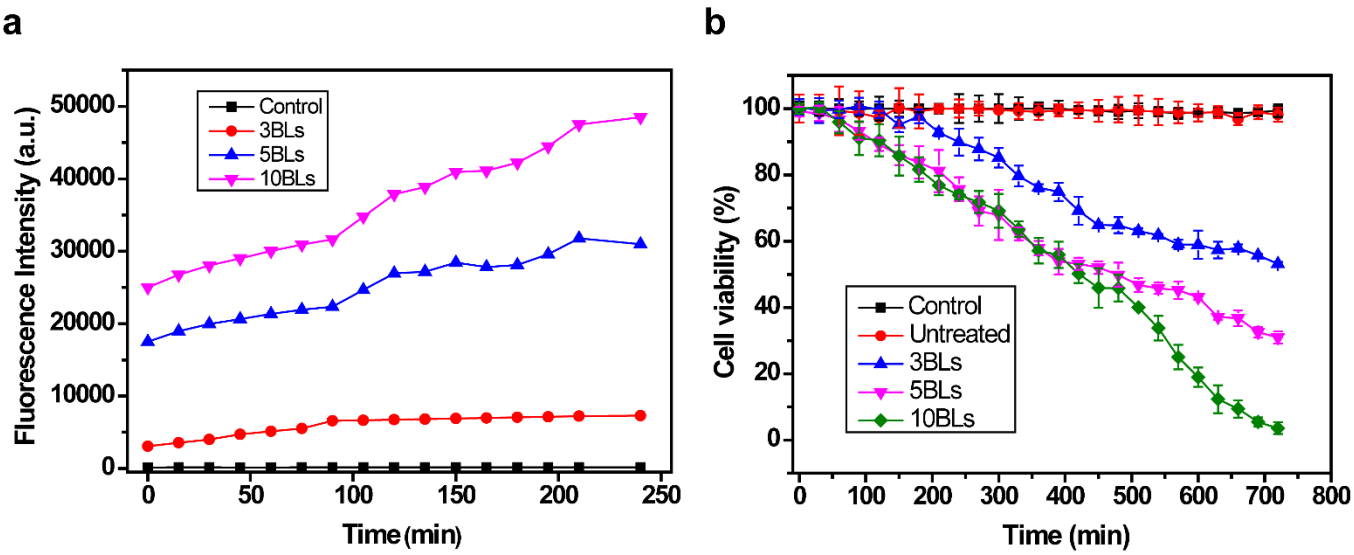

Fig. S14 (a) *In vitro* ROS measurements and (b) Percentage survival ratio in *E. coli* with different bilayers (3BLs, 5BLs and 10BLs) under light conditions.

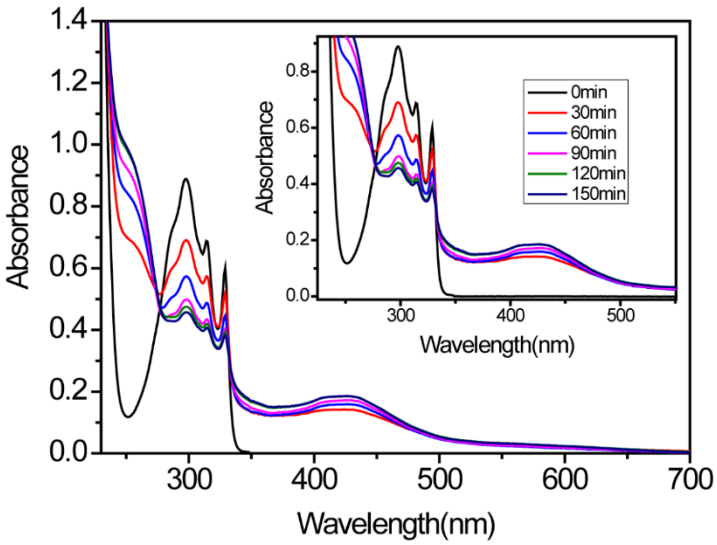

Fig. S15 The changes in the UV-Vis absorption spectrum of an aqueous solution of 1,5-dihydroxynaphthalene (DHN, 0.021 mM) for 10BLs coated **PEI-BF_2**/PAA vial upon exposure to sunlight.