



Paper - Supplementary material

White Light-Photolysis for the Removal of Polycyclic Aromatic Hydrocarbons from Proximity Firefighting Protective Clothing

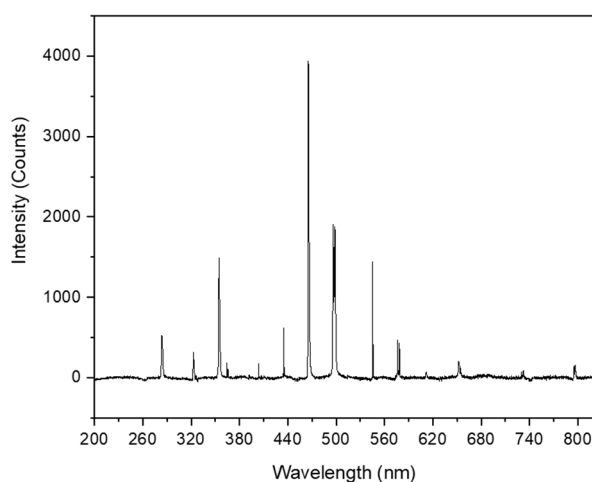


Figure S1. Emission spectrum of 250 W mercury vapor and tungsten filament white light.

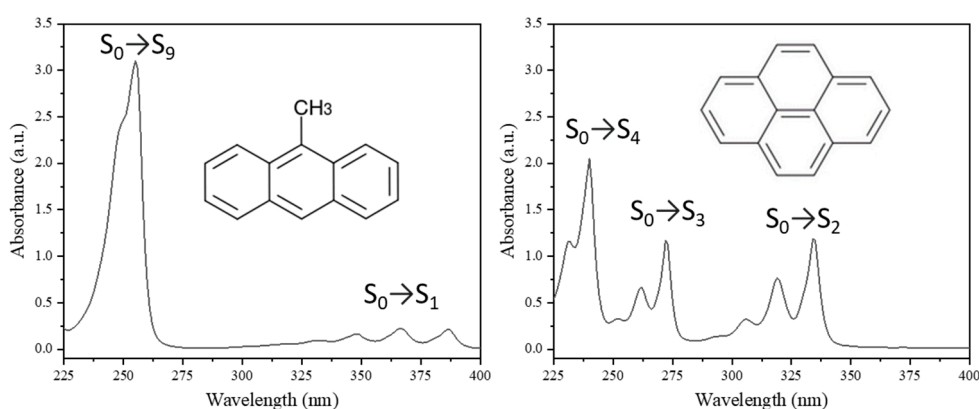


Figure S2. spectrum of 250 W mercury vapor and tungsten filament white light.

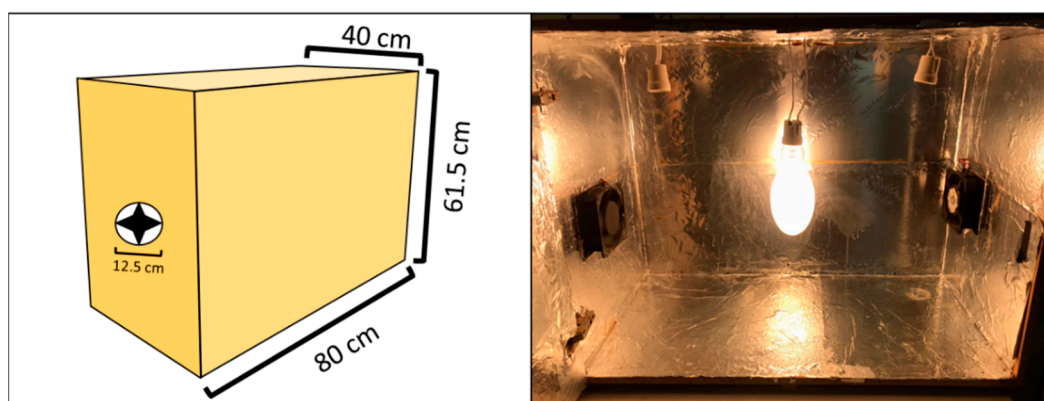


Figure S3. Photoreactor equipped with white light.

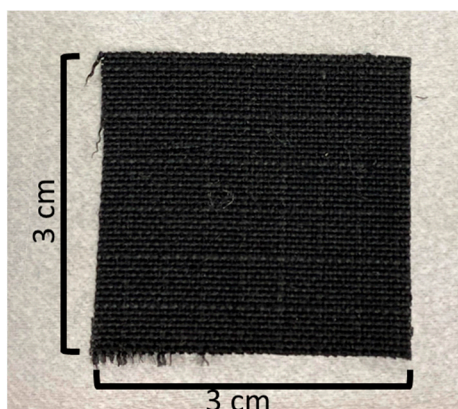


Figure S4. Samples of fabric from the outer shell of the firefighting uniform with composition of 58% para-aramid (kevlar®), 40% meta-aramid (nomex®) and 2% carbon, from Unishell®.

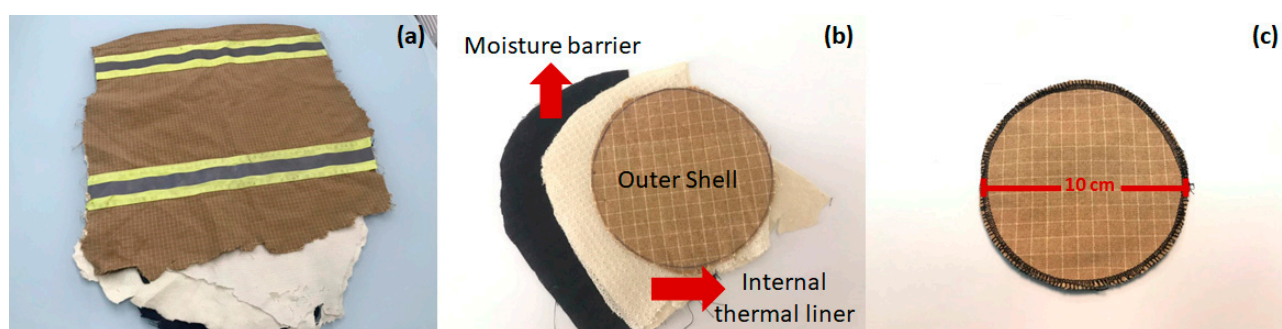


Figure S5. Samples of three-layer fabrics from Brazilian firefighters' protective clothing. (a) jacket pieces, (b) three-layer fabrics samples (c) disk with the three layers sewn together.

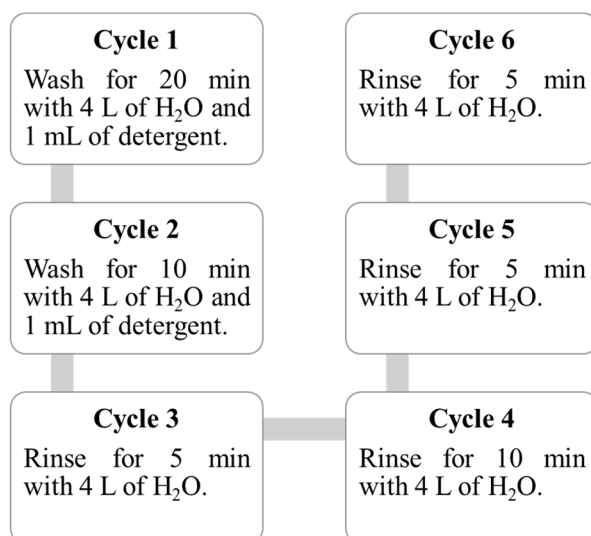


Figure S6. Scheme of three-layer fabric laundering decontamination.

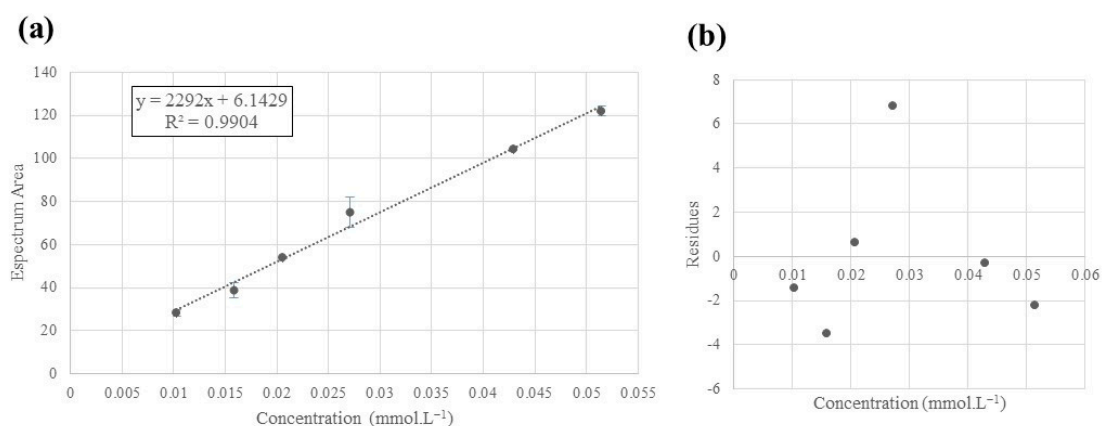


Figure S7. UV/VIS (a) calibration curve for PAHs solution and (b) residual graph.

Table S1. UV/VIS ANOVA table for PAHs solution.

Source	Sum of Squares	Degrees of Freedom	Mean Squares
Regression	6780.34	1	6780.34
Residual	65.96	4	16.49
Lack of fit	65.96	4	16.49
Total	6846.30	5	1369.268

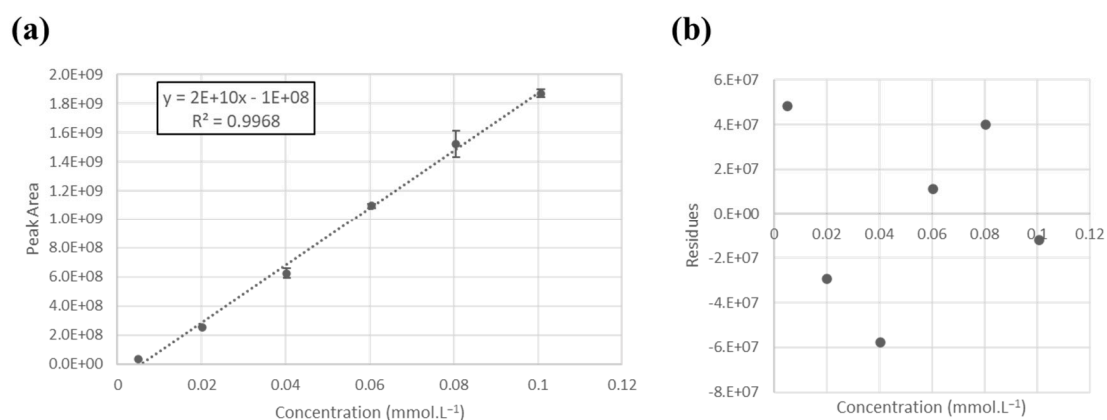


Figure S8. GC/MS (a) calibration curve for PAHs solution and (b) residual graph for 9-methylanthracene.

Table S2. GC/MS ANOVA table for 9-methylanthracene.

Source	Sum of Squares	Degrees of Freedom	Mean Squares
Regression	2.65E+18	1	2.65E+18

<i>Residual</i>	1.36E+16	4	3.39E+15
<i>Lack of fit</i>	1.36E+16	4	3.39E+15
<i>Total</i>	2.67E+18	5	5.33E+17

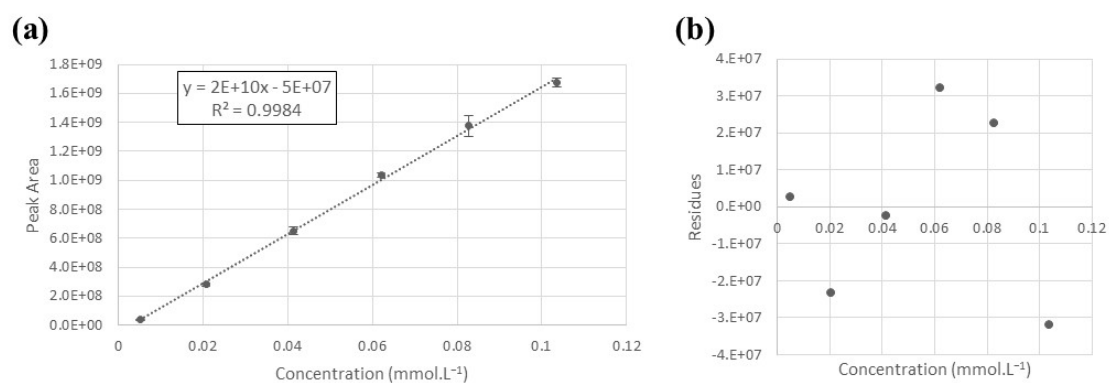


Figure S9. GC/MS (a) calibration curve for PAHs solution and (b) residual graph for pyrene.

Table S3. GC/MS ANOVA table for pyrene.

<i>Source</i>	<i>Sum of Squares</i>	<i>Degrees of Freedom</i>	<i>Mean Squares</i>
<i>Regression</i>	2.00E+18	1	2.00E+18
<i>Residual</i>	3.12E+15	4	7.81E+14
<i>Lack of fit</i>	3.12E+15	4	7.81E+14
<i>Total</i>	2.01E+18	5	4.02E+17

Table S4. Limits of detection (LD) and quantification (LQ), in mmol.L⁻¹, obtained by the analytical curves for the analytes using GC/MS.

	9-methylanthracene	Pyrene
LD	0.00021 mmol.L ⁻¹	0.00016 mmol.L ⁻¹
LQ	0.00071 mmol.L ⁻¹	0.00052 mmol.L ⁻¹

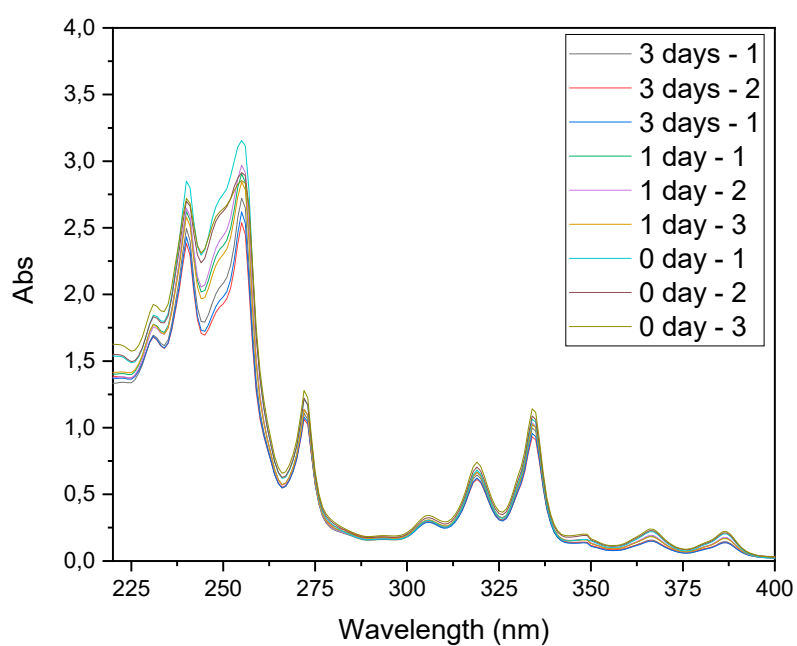


Figure S10. UV/VIS spectra of experiments performed in 0, 1 and 3 days with BLK 0% of H_2O_2 .

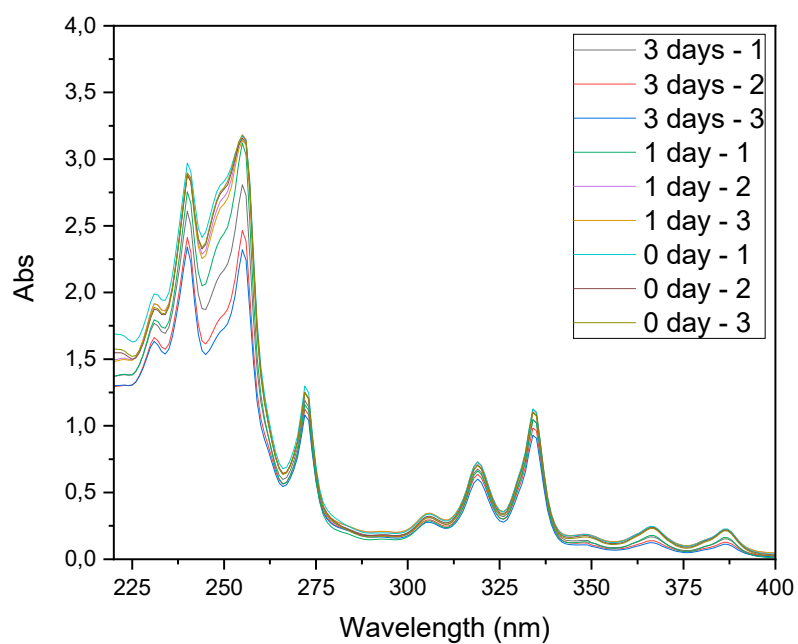


Figure S11. UV/VIS spectra of experiments performed in 0, 1 and 3 days with BLK 0.35% of H_2O_2 .

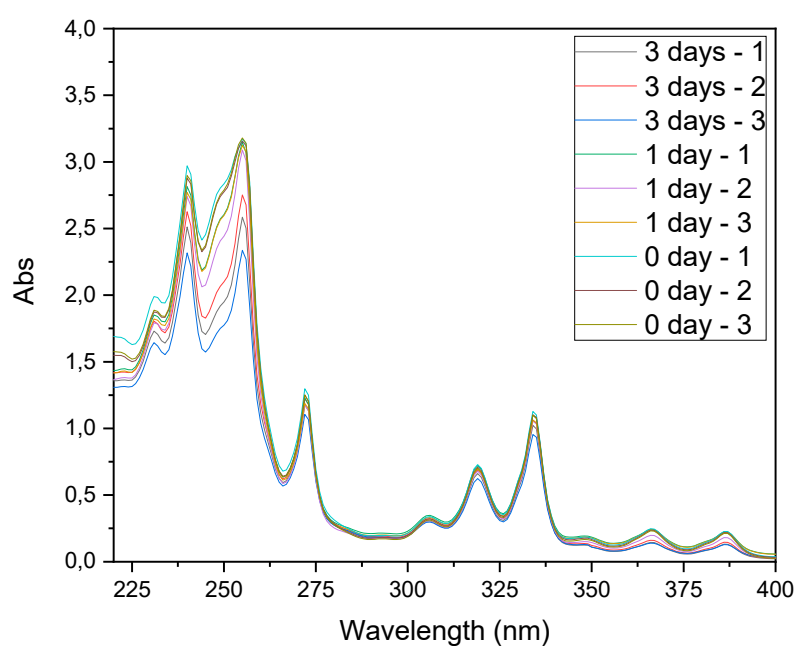


Figure S12. UV/VIS spectra of experiments performed in 0, 1 and 3 days with BLK 3.5% of H₂O₂.

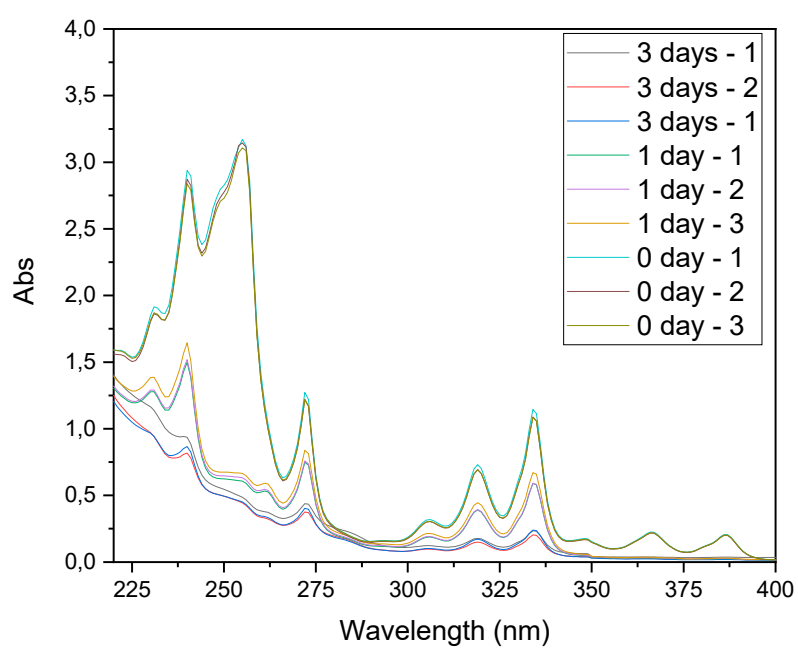


Figure S13. UV/VIS spectra of experiments performed in 0, 1 and 3 days with WLP 0% of H₂O₂.

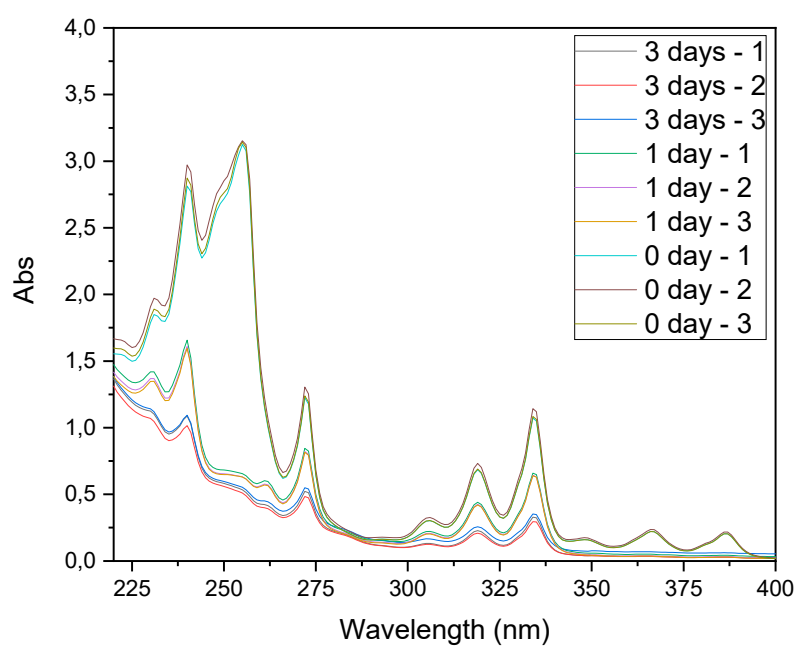


Figure S14. UV/VIS spectra of experiments performed in 0, 1 and 3 days with WLP 0.35% of H_2O_2 .

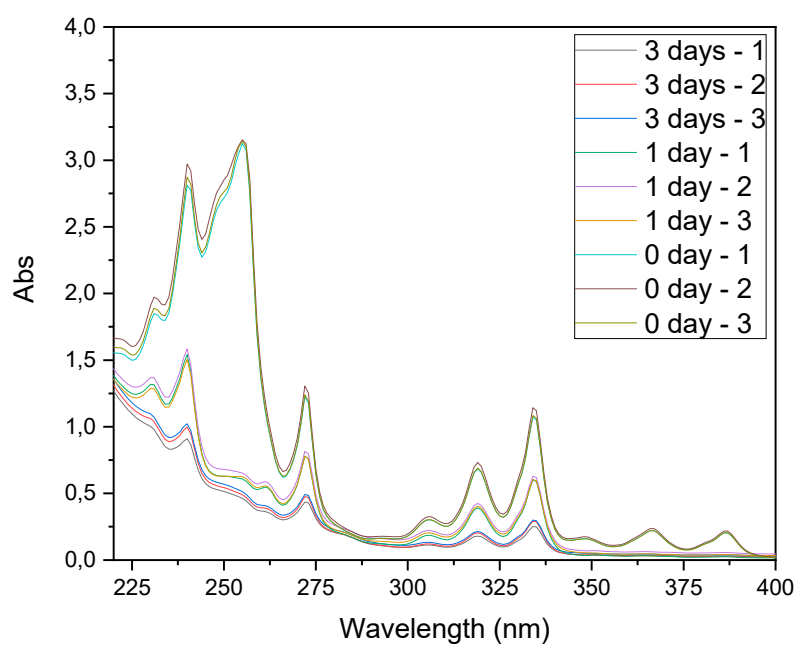


Figure S15. UV/VIS spectra of experiments performed in 0, 1 and 3 days with WLP 3.5% of H_2O_2 .

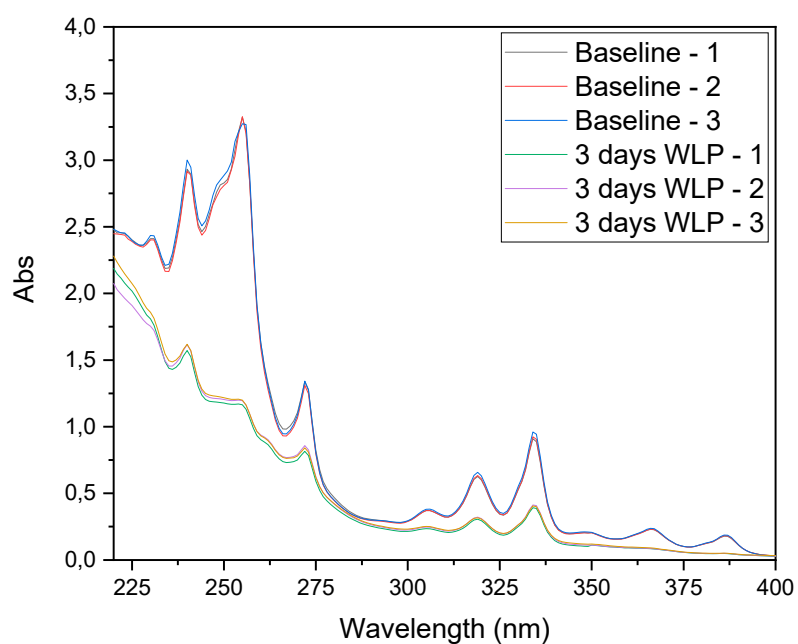


Figure S16. UV/VIS spectra of decontamination procedure performed for WLP decon for 3 days with 0% of H₂O₂.

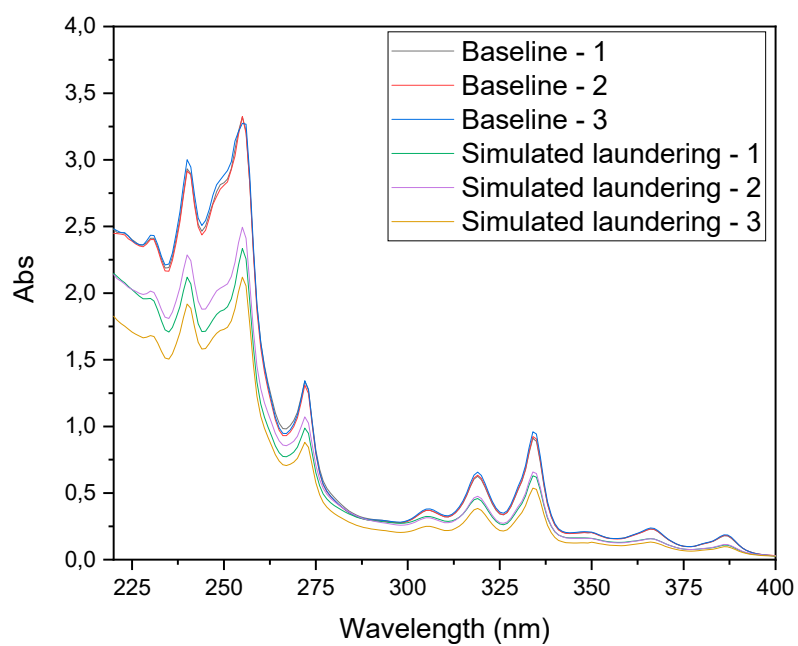


Figure S17. UV/VIS spectra of decontamination procedure performed for simulated laundering decon.

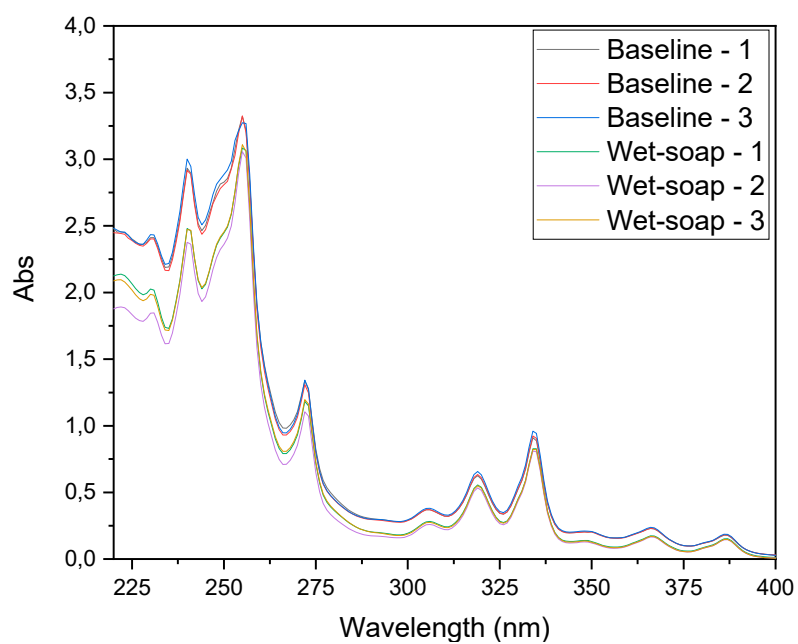


Figure S18. UV/VIS spectra of decontamination procedure performed for wet-soap brushing decon.

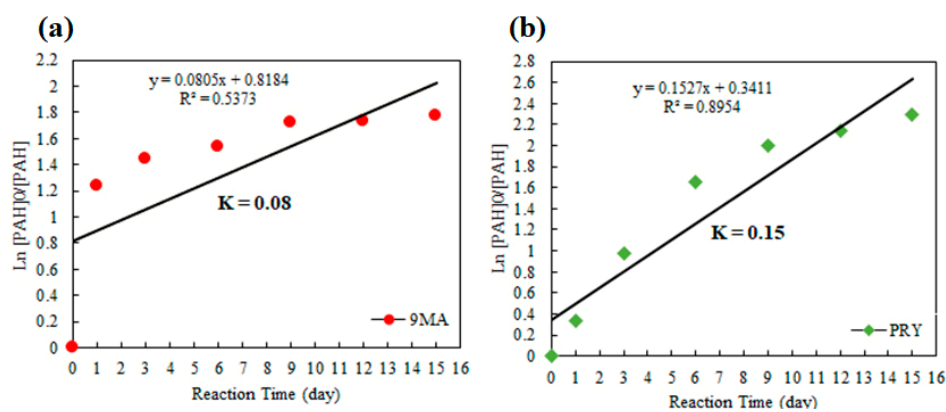


Figure S19. Pseudo first order rate constants for WLP 0% of H_2O_2 reaction of a) 9-methylantracene and b) pyrene degradation.

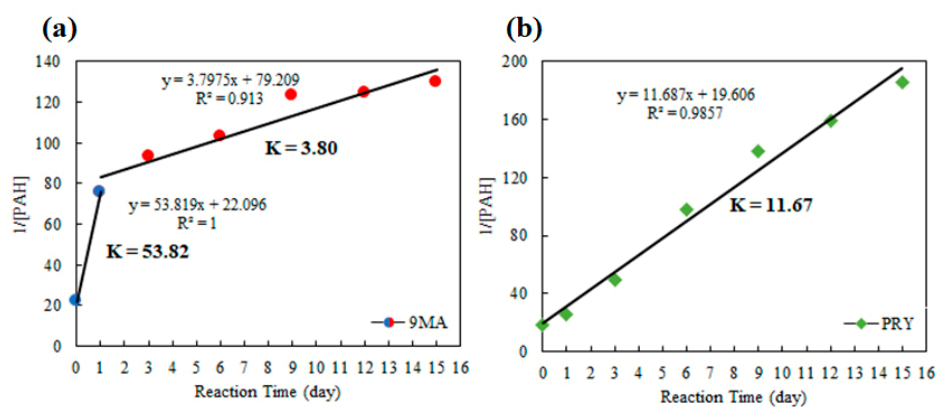


Figure S20. Pseudo second order rate constants for WLP 0% of H_2O_2 reaction of a) 9-methylantracene and b) pyrene degradation.

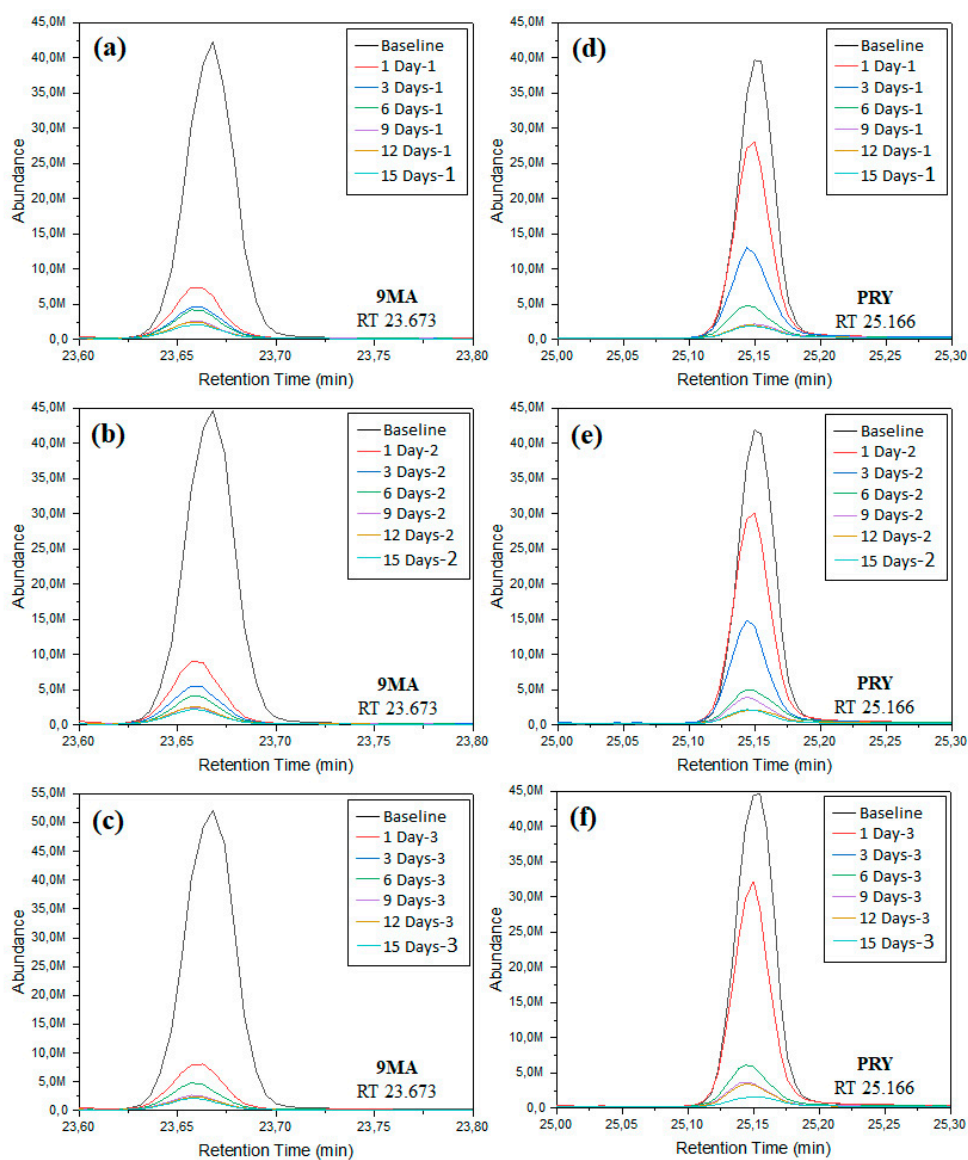


Figure S21. Chromatograms replicas of WLP 0% H₂O₂ experiments for the analyte 9-methylanthracene (a-c) obtained in the retention time of 23.673 min and for the analyte pyrene (d-f) obtained in the retention time of 25.166 min.

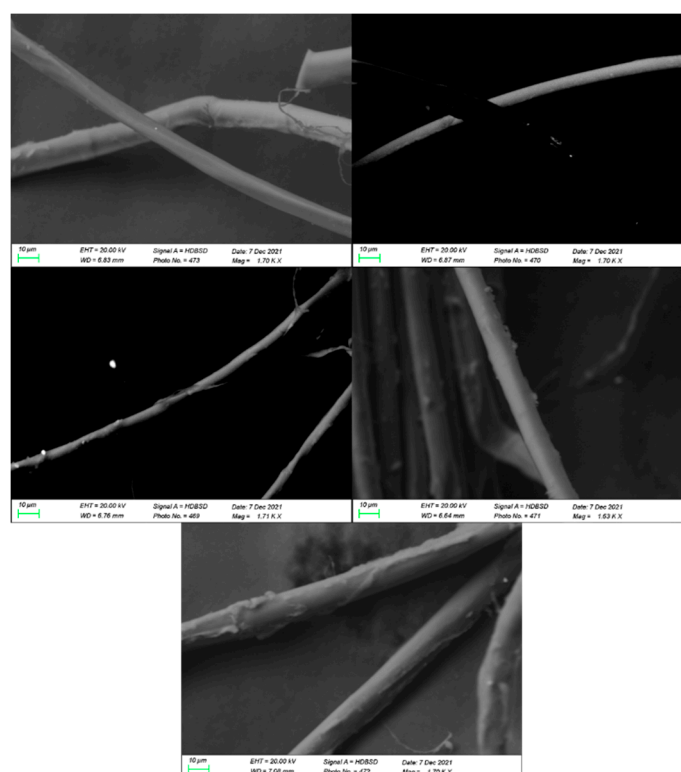


Figure S22. Micrographs of fibers before treatment.

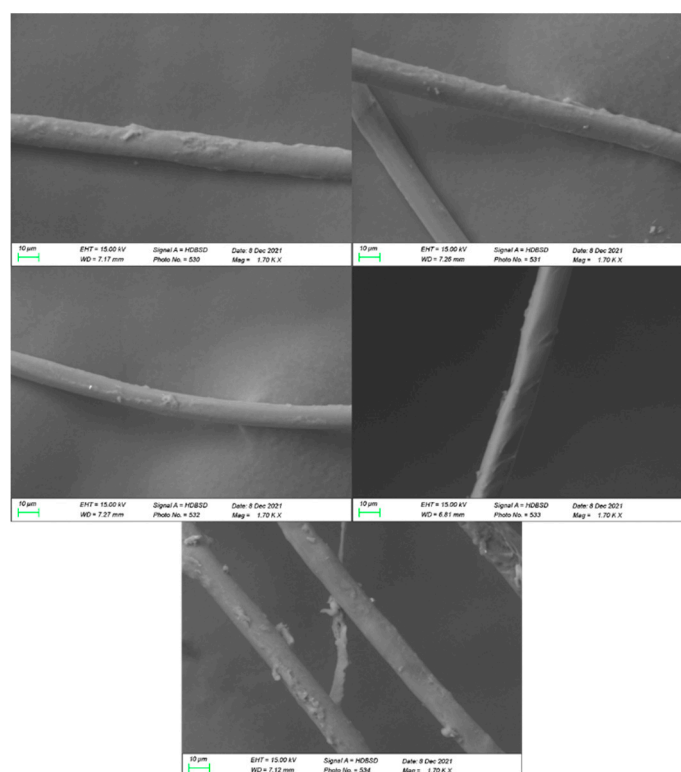


Figure S23. Micrographs of fibers after treatment with BLK 0% of H₂O₂.

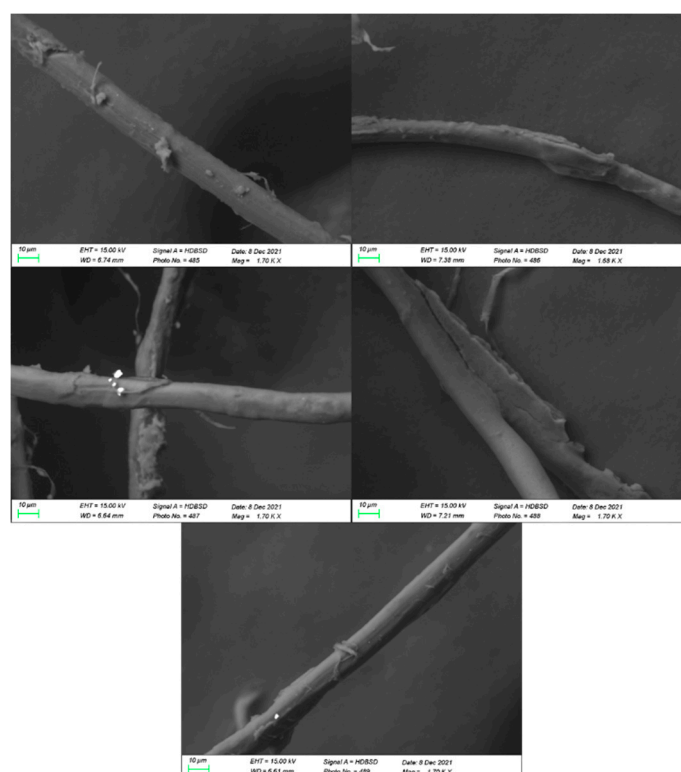


Figure S24. Micrographs of fibers after treatment with BLK 0.35% of H_2O_2 .

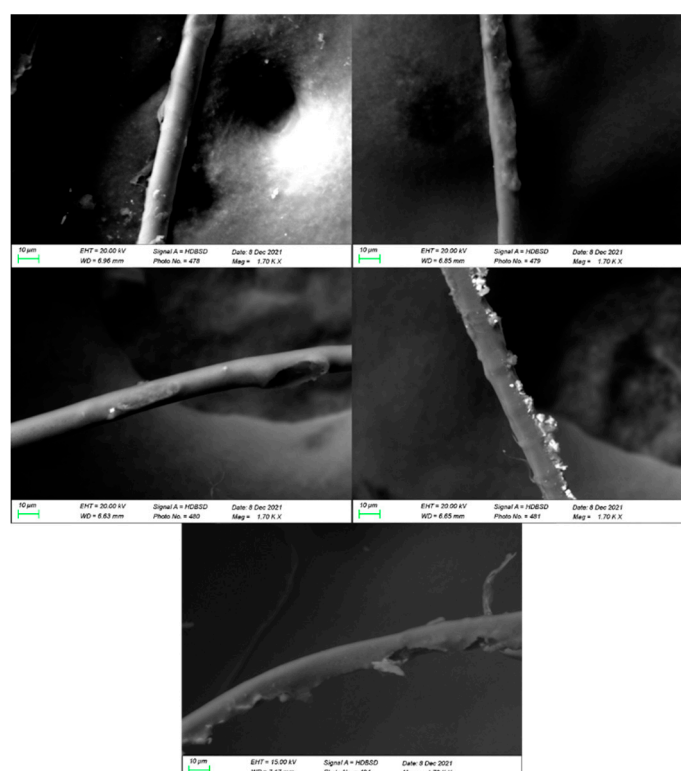


Figure S25. Micrographs of fibers after treatment with BLK 3.5% of H_2O_2 .

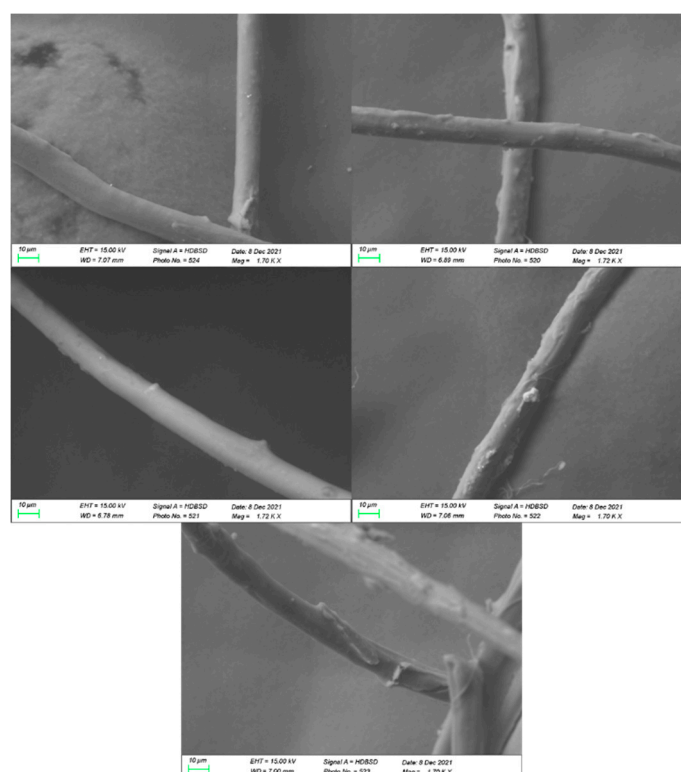


Figure S26. Micrographs of fibers after treatment with WLP 0% of H_2O_2 .

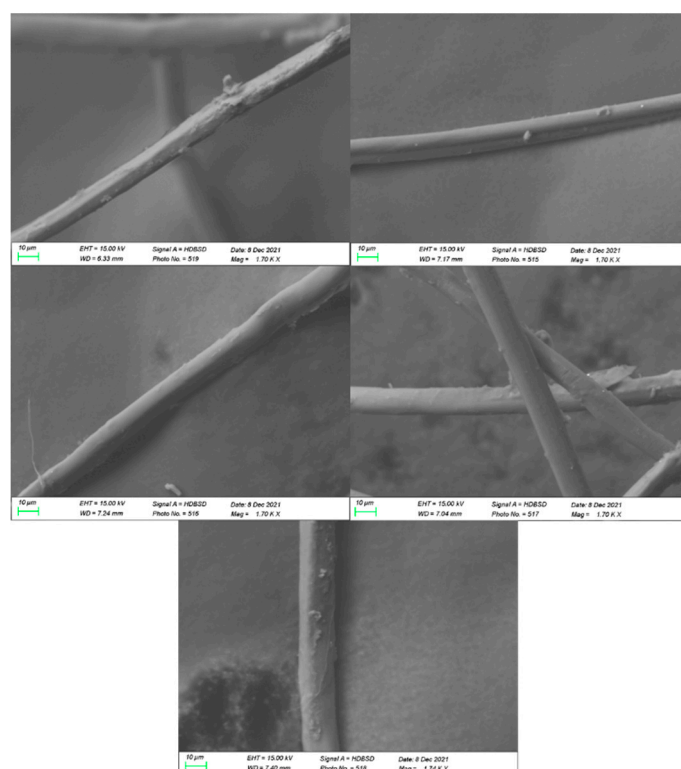


Figure S27. Micrographs of fibers after treatment with WLP 0.35% of H_2O_2 .

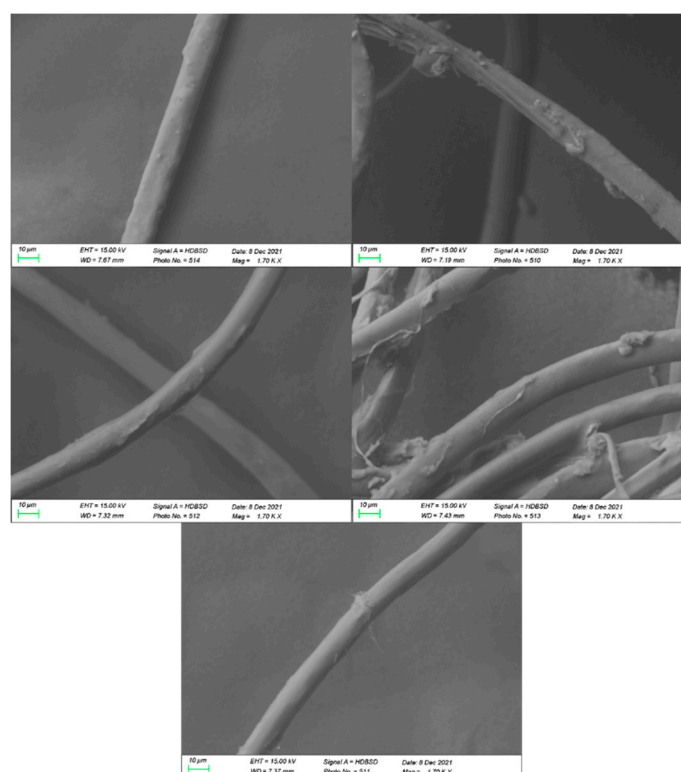


Figure S28. Micrographs of fibers after treatment with WLP 3.5% of H_2O_2 .

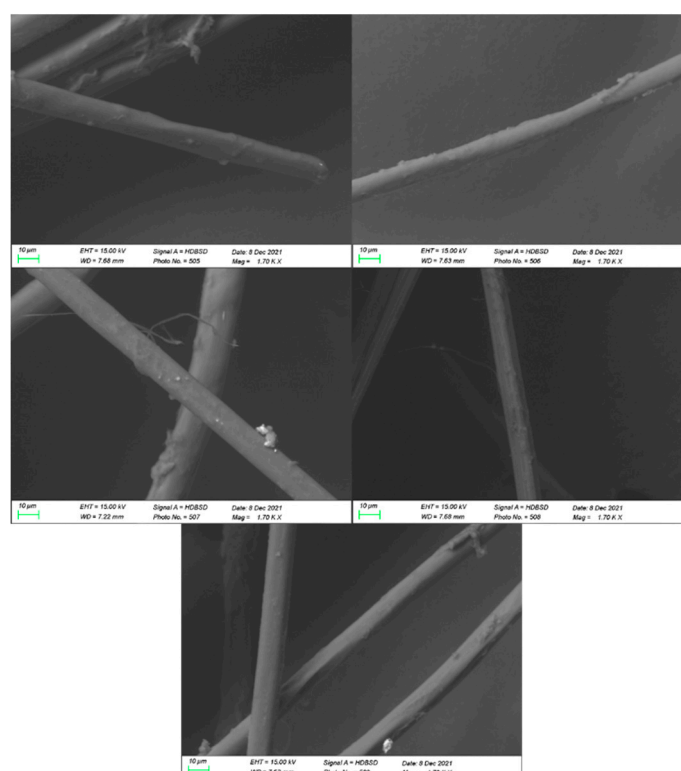


Figure S29. Micrographs of fibers after treatment with WLP 0% of H_2O_2 for 30 days.

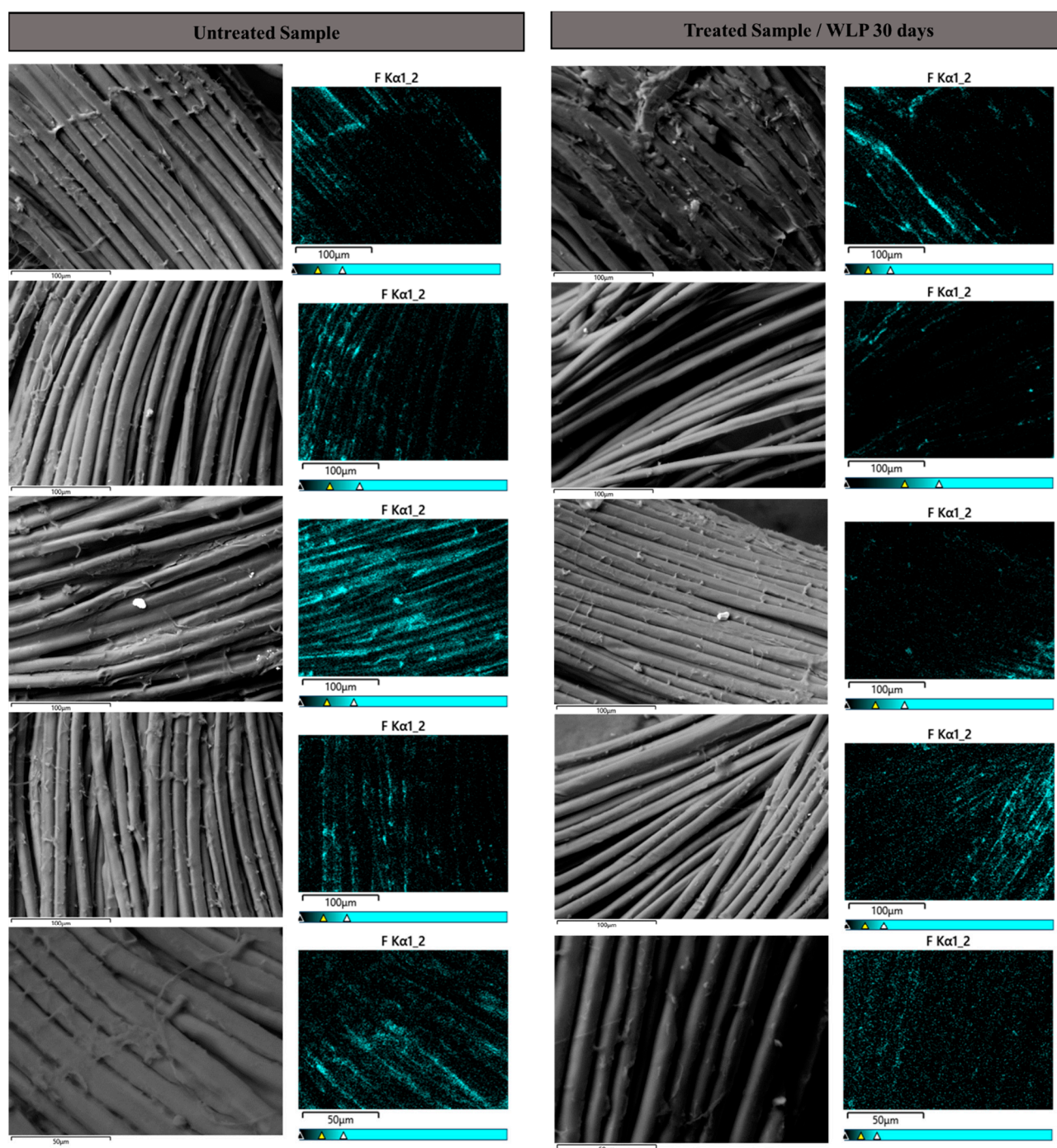


Figure S30. Compositional maps for fluorine for the untreated sample and for the treated sample with WLP and 0% H₂O₂ for 30 days.