Maram Ayesh et al: Fibres

Supplementary Data

Tables

Table S1: Thermal analysis under flowing air for cotton samples with and without 200 W/m^2.min MLSE UV laser/plasma treatment.

Sample	**$T_{10\%}$, °C**	**DTG Peak 1, °C**	**DTG Peak 2, °C**	**DTA Peak 1, ºC**	**DTA Peak 2, ºC**	**Residue at 400 °C, %**
Cot (Cotton)	290	339	461	348	465	21.0 ± 0.3
Cot/N_2	287	338	464	349	467	18.2 ± 1.8
Cot/N_2/CO_2	286	337	463	346	466	19.3 ± 1.6
Cot/N_2/O_2	286	337	456	345	459	19.3 ± 0.1
Cot/Ar	278	336	458	345	460	19.0 ± 0.1
Cot/Ar/CO_2	281	339	453	348	468	21.0 ±1.0
Cot/Ar/CO_2 (no UV)	279	335	452	345	466	18.0± 1.0

Table S2: Thermal analysis results for PET samples after 200 W/m^2.min plasma treatment with different plasma gases

Sample	**$T_{5\%}$, °C**	**DTG Peak 1, °C**	**DTG Peak 2, °C**	**Residue % at 500 °C**
PET	369	431	537	14.0±1.0
PET-Ar	360	431	543	13.0±1.0
PET-Ar/CO_2	358	434	545	14.0±1.0
PET-Ar/CO_2 (no UV)	354	430	542	16.0±1.0
PET-N_2/CO_2	357	438	541	12.0±1.0
PET-N_2/CO_2 (no UV)	360	433	546	14.0±1.0

Figures

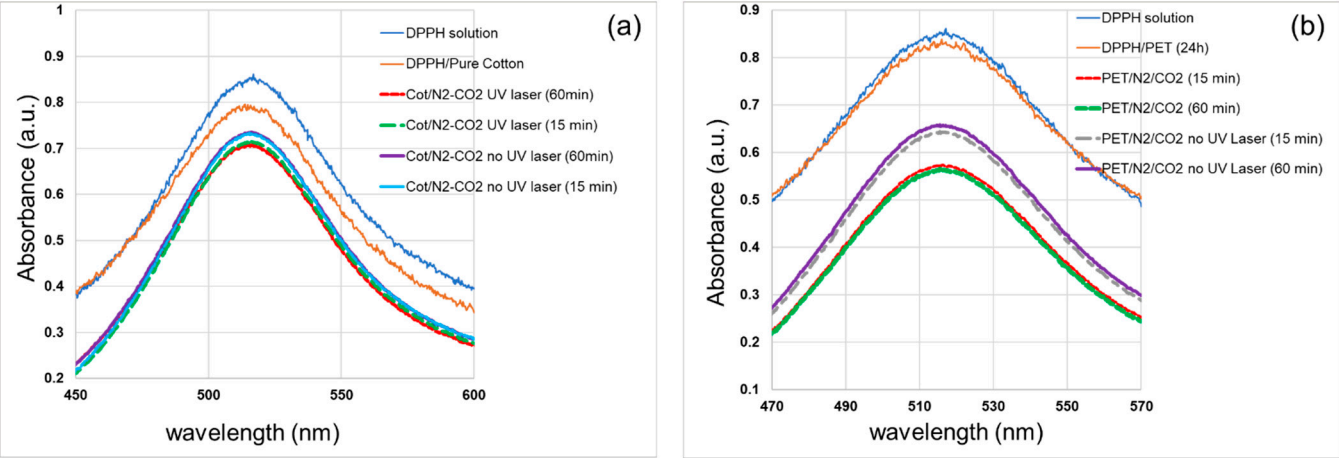
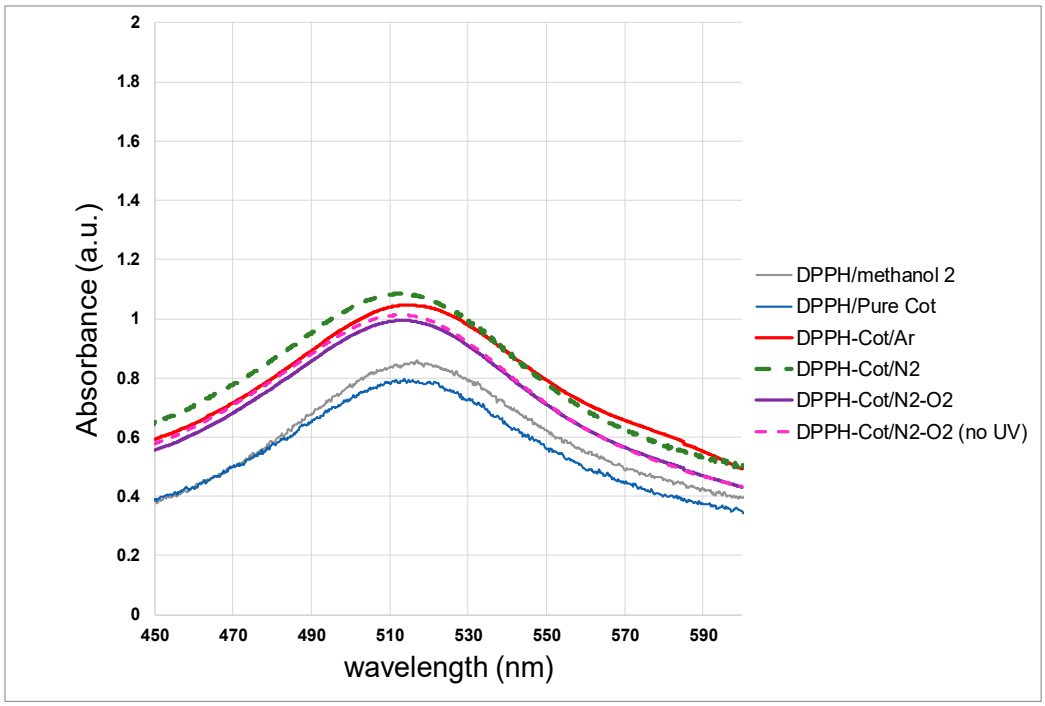
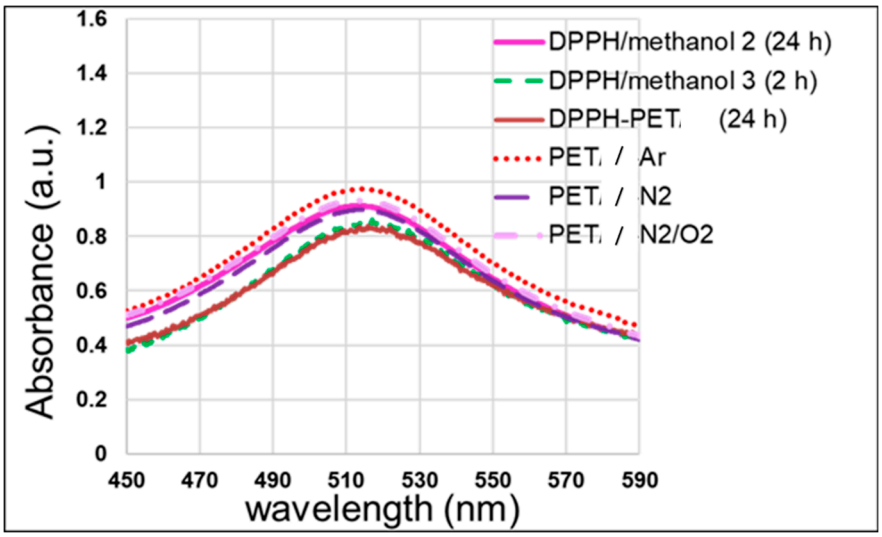


Figure S1: UV-Visible spectra for supernatant DPPH solution/exposed (a) cotton and (b) PET samples after 200 W/m².min MLSE treatment under N_2/CO_2 with and without UV laser. Note that the times in brackets refer to DPPH/fabric immersion times.



(a)



(b)

Figure S2: UV-Visible spectra for supernatant DPPH solutions from (a) cotton and (b) PET samples subjected to 3500 W/m^2.min (as 3.5 kW) MLSE treatment under Ar, N_2 and N_2/O_2 with UV laser, after 24 h immersion.

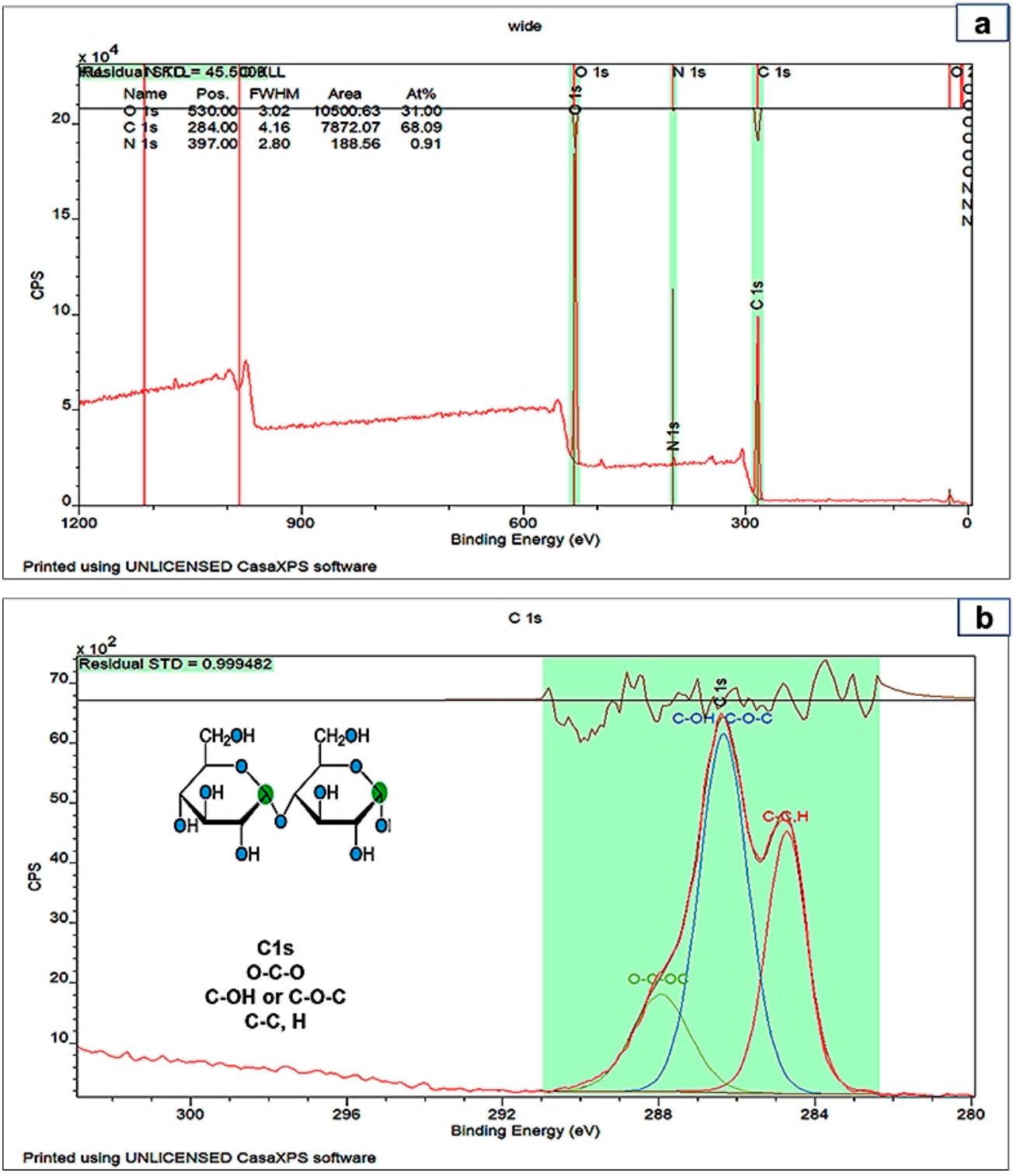


Figure S3: XPS spectra of the pure cotton fabric. a) full XPS spectrum, b) C1s high resolution spectrum. The peaks are curve fitted and deconvoluted using CasaXPS software to calculate the relative concentrations and different types of chemical bonds of the samples.

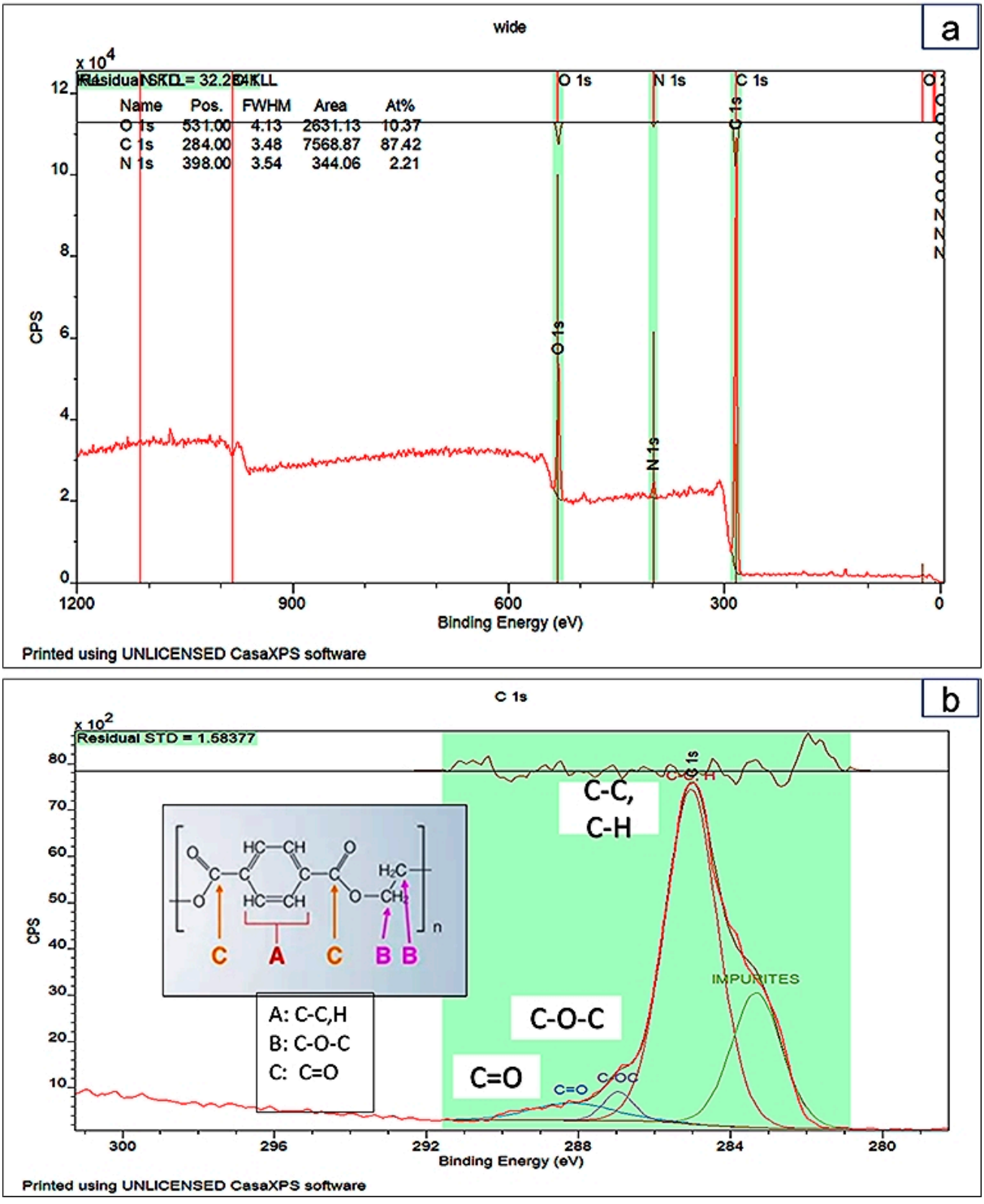


Figure S4: XPS spectra of the pure polyester (PET) fabric, a) Full spectrum, b) C1s high resolution spectrum. The peaks are curve fitted and deconvoluted using CasaXPS software to calculate the relative concentrations of the different types of carbon-containing chemical bonds in the samples.

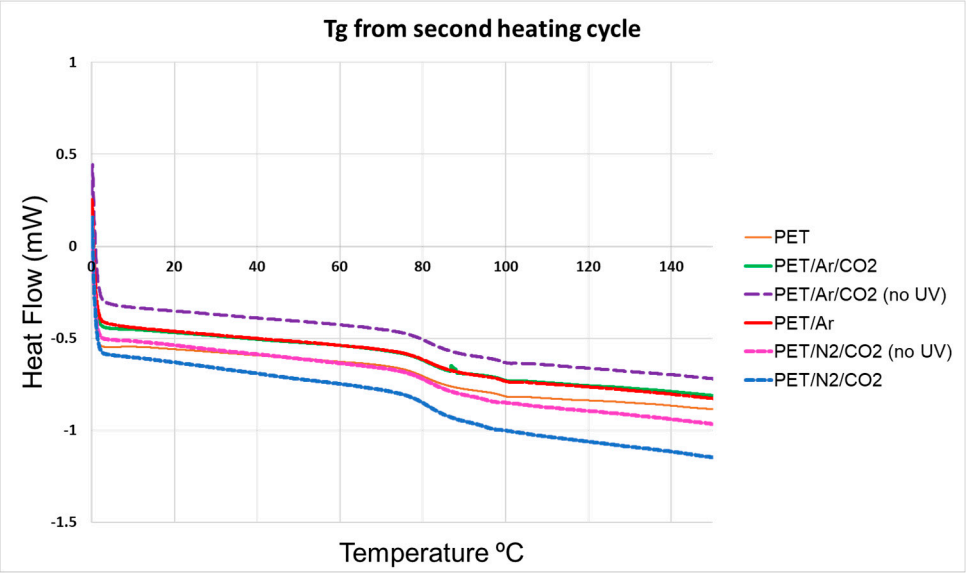


Figure S5: DSC traces during the second heating cycle showing glass transition (T_g) of PET with and without 200 W/m^2.min plasma treatments

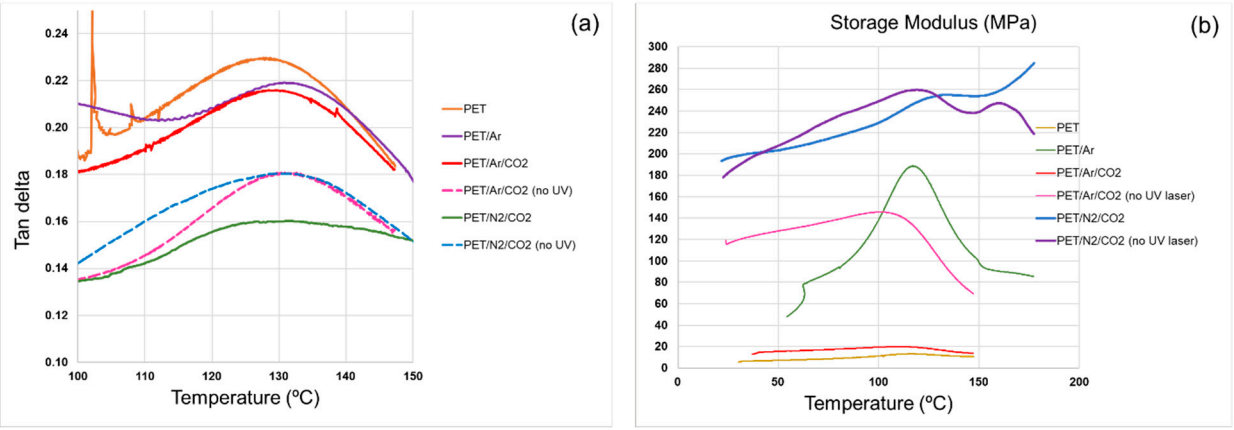


Figure S6: DMA analysis for PET before and after 200 W/m^2.min plasma treatments: a) Tan delta, b) Storage Modulus vs Temp curves