

## SUPPLEMENTARY SHEET

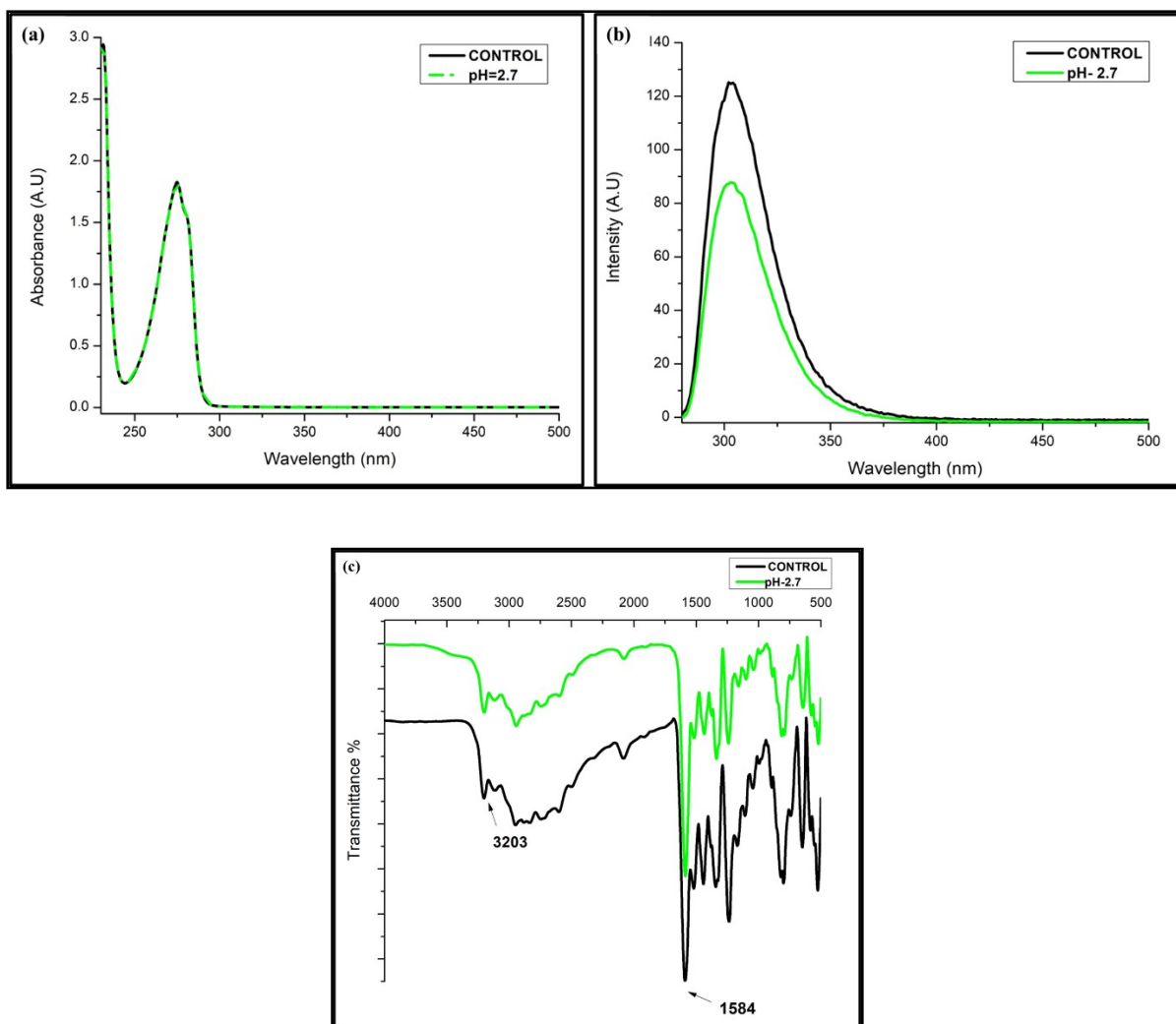
**Table S1: pH comparison of untreated (control) and CAP-treated samples in buffered medium**

Feed Gas	pH (control)	pH (5 min)	pH (10min)
Helium	7.50	7.49	7.48
He-Air	7.50	7.45	7.20

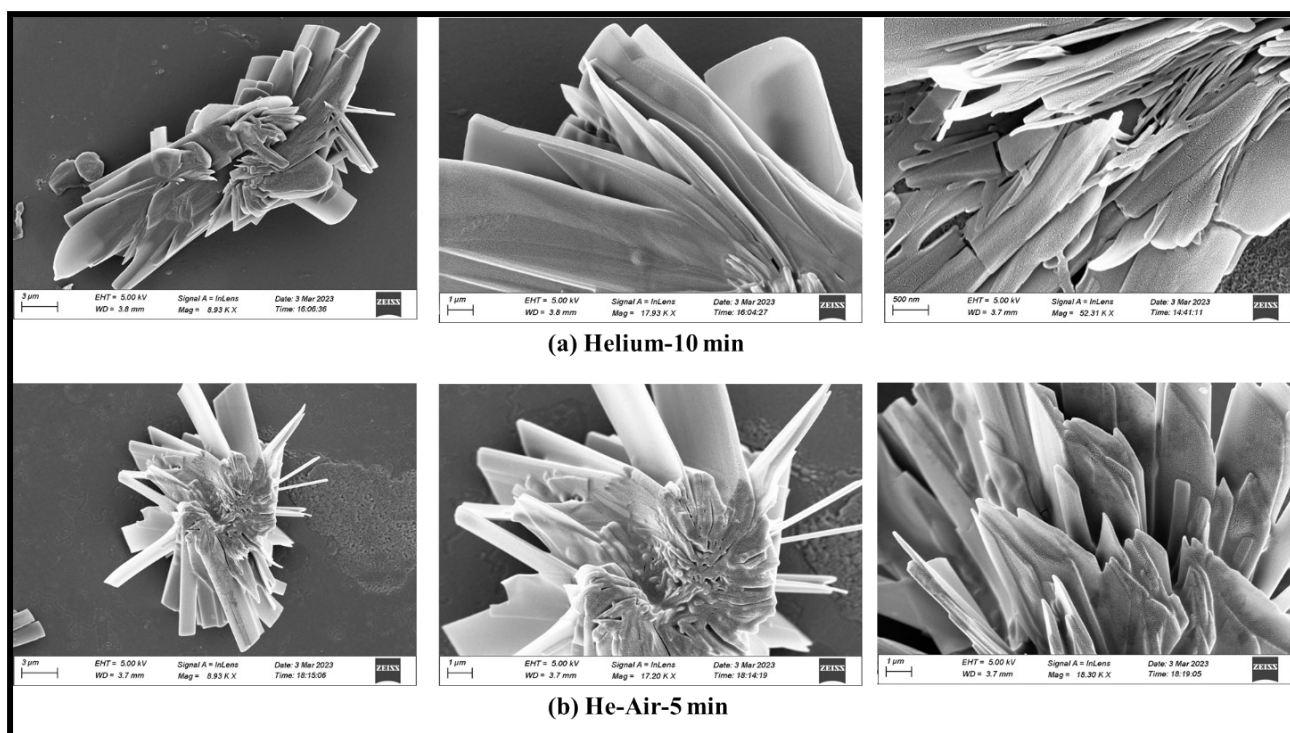
### Controlled Studies:

To validate that the effects observed in spectroscopic techniques are a result of reactive species generated by the plasma, rather than solely arising from solvent acidification, we repeated these experiments after introducing acidity (pH=2.7) to the untreated (control) tyrosine solution by adding HCl (2.5mM). UV-Vis, fluorescence quenching, and FTIR spectra were recorded. Notably, the absorption value of the control tyrosine in the acidified control (Figure 4-(a)) exhibited minimal change. While the PL spectra indicated a slight fluorescence quenching, it was not as pronounced as in plasma-treated tyrosine solutions. Furthermore, no new peaks emerged in the acidified control, in contrast to the plasma-treated solutions. The FTIR spectra of the acidified control sample showed no merging of the peaks and no new peaks were recognized.

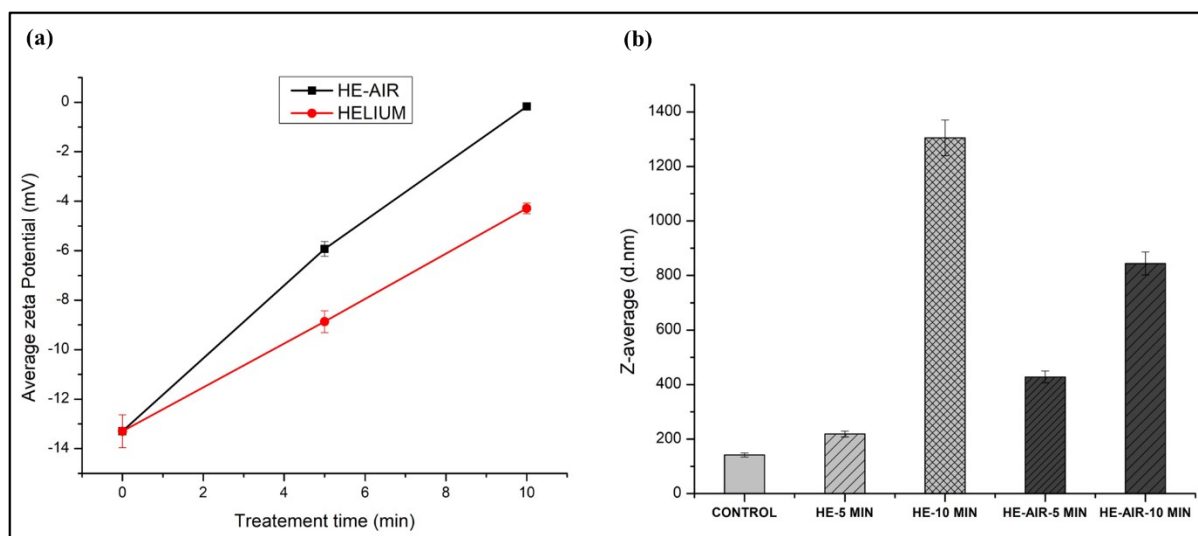
Considering that solution acidification does not induce significant chemical changes, the presumption is that the changes are predominantly attributed to the reactive oxygen and nitrogen species (RONS) generated by the plasma effect. This assumption is reinforced by the analysis of mass spectra, which reveals differences in the chemical structures between the compounds induced by RONS, shown in the subsequent section.



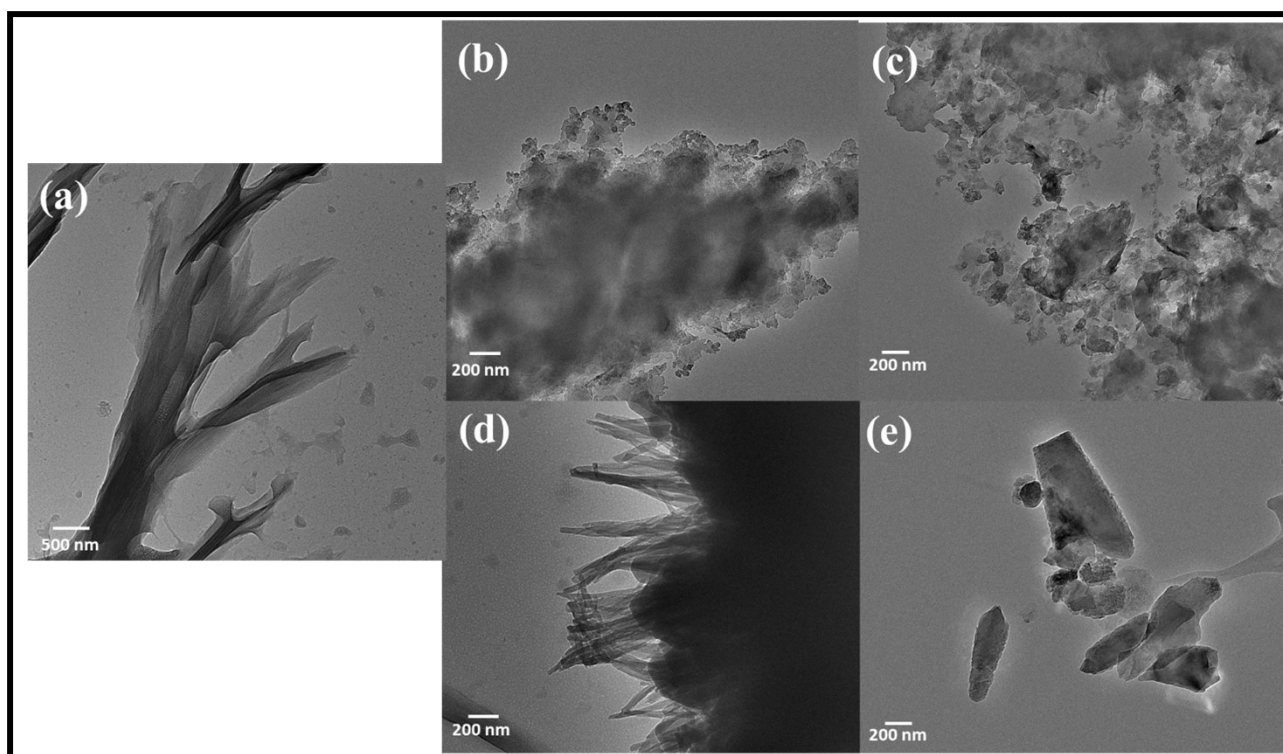
**Figure S1: Comparison of UV-Vis spectra (a), fluorescence spectra (b), and FTIR spectra (c) of tyrosine control and acidified tyrosine control (pH-2.7; without plasma treatment).**



**Figure S2: SEM images with a higher magnification**



**Figure S3: Zeta potential (a) and DLS analysis (b) of L-tyrosine treated with Helium and He-air plasma**



**Figure S4: Comparison of TEM imaging in a CAP-treated buffered solution of L-tyrosine**