

# Mass spectroscopy of oxygen plasmas with energetic ions

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Nowadays the preparation of nanostructured materials is of extreme interest for a variety of applications in electronics, energy and biomedical fields.

Recently air and oxygen plasmas produced in a capacitive reactor have been used to modify the morphology of the material surfaces and have been shown to be effective in the enhancement of the polymeric surface area [1]. The processes responsible for nano-structuring are ascribable to chemical etching promoted by atomic oxygen.

In this paper we will study the processing in a new configuration based on an inductive plasma characterized by the presence of kinetic ions that could modify the stoichiometry of the chemical etching on the surface. The analysis is based on the mass spectrometry of the neutral and ionic species produced in the new plasma configuration, with a particular focus on the evaluation of the ionic energies involved in the interaction with the material surface [2].

The mass and energy spectra of the oxygen plasma will be investigated as a function of the gas pressure, flow-rate and RF power.

[1] Piferi C., Bazaka K., D'Aversa D.L., Di Girolamo R., De Rosa C., Roman H.E., Riccardi C., and Levchenko I., *Advanced Materials Interfaces*, **8** (2021) 2100724.

[2] Barni R., Zanini S., and Riccardi C., *Advances in Physical Chemistry*, **12** (2012) 205380.