Exploring the Various Aspects of Cold Atmospheric Plasma Technology

Christos A. Aggelopoulos[#,*], **Maria Hatzisymeon, Stauros Meropoulis, Stefania Giannoulia, Konstantia Papalexopoulou, Despoina Tataraki** and **Oxana Dolinski**

Laboratory of Cold Plasma and Advanced Techniques for Improving Environmental Systems, Institute of Chemical Engineering Sciences, Foundation for Research and Technology Hellas (FORTH/ICE-HT), GR-26504, Patras, Greece

Presenting and * Corresponding author: Christos Aggelopoulos, email: caggelop@iceht.forth.gr

ABSTRACT

Cold atmospheric plasma (CAP) is a novel non-thermal technology, which has shown significant potential in the fields of environmental remediation, materials processing and medical applications. The efficiency of CAP method lies on the generation of high energy electrons (up to 1–10 eV), and the subsequent production of a significant number of energetic and chemically reactive species (e.g., free radicals, excited atoms, ions, and molecules) which act as the driving force for the initiation and propagation of plasma chemical reactions. One of the most important advantages of the method is that it doesn't demand high temperatures reducing therefore the energy consumption. Since different types of plasma discharges (e.g. glow discharge, corona discharge, radio frequency discharge, gliding arc discharge and dielectric barrier discharge) or operating gases can be used, different properties for the plasma could be resulted and thus the genesis of a variety of applications may arise.

The main goal of PlaNET laboratory is to develop novel cold plasma-based systems in order to exploit in a maximum level the benefits of CAP technology towards the highly energy efficient remediation of contaminated environmental sites (i.e. water, soil, groundwater) by persistent and recalcitrant pollutants such as dyes, antibiotics, pesticides, PFAs, etc. [1-2]. The design and consideration though of all critical parameters towards the establishment of an ideal setup is not profound. Therefore, an in-depth investigation is performed both in lab and upscaled basis. A parallel goal of PlaNET is the use of CAP method for the effective modification/regeneration of materials and the apoptosis of cancer cells [3].

REFERENCES

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