



Study on Operation Mode Transformation and Intelligent Diagnosis of cold atmospheric plasmas (CAPs) and Their Applications in Bio-medicine and Green Agriculture

Zilan Xiong, Chen Lu, Mengqi Li, Yuqi Wang, Renjie Huang

State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Huazhong University of Science and Technology, WuHan, Hubei 430074, People's Republic of China
e-mail (speaker):zilanxiong@hust.edu.cn

Cold atmospheric plasmas (CAPs) have great potential and advantages in many fields, such as sterilization and disinfection, biomedicine, environmental protection, material processing, green agriculture, and in the food industry.^{[1][2]} Among these potential applications, the development of plasma sources, the regulation mechanism of product modes, and the development of new online diagnosis methods are all key issues faced by CAPs in practical applications.^{[3][4]} Meanwhile, the interaction mechanism between plasma and matter is also its theoretical basis in different applications.

We focus on these key issues and present the effect of dielectric parameters on the transformation of operation mode and the energy cost of nitrogen fixation of surface microdischarge (SMD) in air, the visible light information of SMD in different operation modes and the development of related online intelligent diagnosis

method based on digital image.

Finally, we will briefly introduce our latest work on CAP applications in bio-medicine and green agriculture. This work is supported by Independent Innovation Fund of Huazhong University of Science and Technology (No. 2018KFYYXJJ071) and the National Natural Science Foundation of China (No. 51907076).

References

- [1] Lu C, Dai J, Dong N, Zhu Y and Xiong Z. Plasma Process Polym. 17 e2000100 (2020).
- [2] Xiong Z, Huang R, Zhu Y, Luo K, Li M, Zou Z, Han R, Plasma Process. Polym. 18 e2000204 (2021).
- [3] Zou Z, Han R, Lu C and Xiong Z, Plasma Process Polym. 18 e2000139 (2021).
- [4] Wu Y, Ye Q, Li X and Tan D, IEEE Trans. Plasma Sci. 40 1371-9 (2012).