

Volatile Organic Compounds depletion by Surface Dielectric Barrier Discharge

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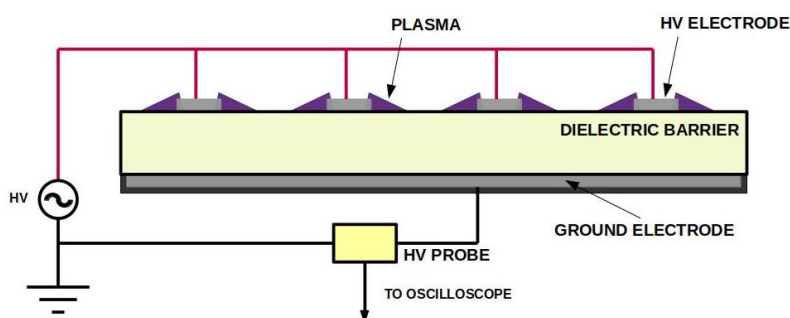


Figure 1: Sketch of the modeled SDBD reactor.

The use of Surface Barrier Dielectric Discharge (SDBD) is increasing in different application fields, such as the removal of volatile organic compounds or pathogenic organisms from air.

The aim of this work is to study the Volatile Organic Compounds (VOCs) depletion using a SDBD plasma device in asymmetrical geometry [1].

Further research is needed in order to understand which are the mechanisms responsible for the depletion processes and therefore being able to increase the abatement efficiency.

We evaluate VOCs decomposition efficiency as a function of plasma power, VOCs concentration and treatments time. We also studied the intermediate species produced by the primary VOCs and its interaction with the plasma.

The experiment is performed in order to study the chemical kinetics towards the chemical equilibrium of the VOC species.

We correlated the O₃ and NO₂ production gases with the VOCs depletion time rates during the treatment.

References

[1] C. Piferi, R. Barni, H. E. Roman, C. Riccardi, *Applied Sciences* **11**, 5 (2021)