



Showcasing research from Professor Hartman's laboratory,
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Ignition of non-equilibrium methane dielectric barrier
discharges in a multiphase plasma-liquid microfluidic device

We investigated the interaction of atmospheric pressure dielectric barrier discharge plasmas in argon-diluted methane within a microreactor, with and without a co-flow of organic solvents. Our in-house designed borosilicate/silicon DBD microreactor chip enabled studies on plasma ignition voltage under varying methane fractions and liquid co-flow. We analyzed operating conditions, including applied voltage, flow patterns, and liquid properties, using optical emission spectroscopy and IR-thermography. This method helps detect plasma activation and refine operating conditions for stable plasma glow discharges in microreactors.

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Mackenzie Meyer, Mark Kushner, Rylan L. Hartman.

As featured in:



See Ryan L. Hartman *et al.*,
Lab Chip, 2025, **25**, 2182.