Abstract Submitted
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Modeling Humid Helium Plasmas and Their Interaction with Liquid Water Droplets[1] MACKENZIE MEYER, Univ. of Michigan, GAURAV NAYAK, PETER BRUGGEMAN, Univ. of Minnesota, MARK J. KUSHNER, Univ. of Michigan — Atmospheric pressure plasma activation of liquid water droplets is typically more efficient at transferring reactive species to the liquid than treating bulk liquid due to the droplets' larger surface-to-volume ratio. The mechanisms for transferring plasma activated species into a droplet are not clear, particularly for short-lived species that may also react in the evaporating layers adjacent to the surface of the droplet. To quantify these processes, single droplets in atmospheric pressure radio frequency excited He discharges are being investigated experimentally and computationally. The droplets contain formate, and the change in formate concentration is a measure of interactions between short-lived species such as OH_{aq} and the droplet. The 2D modeling platform *nonPDPSIM* was used to simulate a reduced volume near the droplet and the full reactor with and without the water droplet to ascertain the influence of the droplet on the plasma. The plasma is sustained in humid He between electrodes 9.5 mm long and separated by 2 mm. 40 micron diameter water droplets flow with the ambient gas through the plasma. Plasma properties near the droplet, transfer of plasma activated species to the droplet and formate consumption will be discussed, with comparison to companion experiments.

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