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**Time-dependent areal mass density for disc-shaped substrates in a corona-activated flow stream at atmospheric pressure for argon/acetylene admixture** SHUZHENG XIE, ROKIBUL ISLAM, BASHIR HUSSEIN, KARL ENGLUND, PATRICK PEDROW, Washington State University — In this research we use a 40-needle array energized with 60 Hz AC voltage in the range 5 to 15 kV RMS. Plasma processing takes place downstream from a grounded planar screen (the opposing electrode). The needle-to-screen gap is in the range 4 to 10 cm and its E-field generates weakly ionized plasma via streamers and back corona. Deposited material is plasma-polymerized acetylene. Substrates are potassium bromide, mica, wood, paper, and gold-covered solids. Substrate chemical species influence the efficiency with which the disc amasses plasma-polymerized material, at least until the substrate is fully covered with film. Early plasma-polymerization is accompanied by nucleation-site-dominated nodules but longer term deposition results in a film that fully covers the substrate. We will report on time-dependent areal mass density associated with run times in the range 5-60 minutes. Film thickness will be measured using instruments that include visible light microscopy, TEM, and SEM. Others in our research group are studying areal mass density for early times (1-5 minutes) when nodule growth (at nucleation sites) dominates the deposition process.

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