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Modeling of a large experimental DBD reactor using Ar-HMDSO mixtures at atmospheric pressure M. M. BECKER, Leibniz Institute for Plasma Science and Technology, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany, D. HEGEMANN, Empa, Swiss Federal Laboratories for Materials Science and Technology, Plasma & Coating Group, Lerchenfeldstr. 5, 9014 St. Gallen, Switzerland, B. NISOL, S. WATSON, M. R. WERTHEIMER, Groupe des Couches Minces (GCM) and Department of Engineering Physics, Polytechnique Montréal, Montreal QC, Canada H3C 3A7, C.-P. KLAGES, TU Braunschweig, Institute for Surface Technology, Bienroder Weg 54, 38108 Braunschweig, Germany, D. LOFFHAGEN, Leibniz Institute for Plasma Science and Technology, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany — Hexamethyldisiloxane (HMDSO) is often used as monomer in dielectric barrier discharges (DBDs) for the deposition of organosilicon films. Already small admixtures of a few ppm of this monomer to the noble carrier gas lead to drastic changes of the discharge characteristics due to Penning ionization processes. In the present contribution, the impact of HMDSO on the electrical discharge characteristics of a large reactor for performing DBD experiments at atmospheric-pressure is investigated by means of numerical modeling. A time-dependent, spatially one-dimensional fluid model has been used to analyze discharges in argon with monomer admixture in the range from 0 to 600 ppm applying an a.c. voltage with an amplitude of 4 kV and a frequency of 20 kHz. First comparison with corresponding experimental data shows quite good agreement between measured and modeling data for the discharge current.

Detlef Loffhagen
Leibniz Institute for Plasma Science and Technology,
Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany

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