

Abstract Submitted
for the GEC06 Meeting of
The American Physical Society

Plasma properties in microcathode sustained discharges in oxygen containing mixtures – comparisons of experiments and models G. BAUVILLE, J.F. LAGRANGE, L. MAGNE, V. PUECH, LPGP, Orsay, France, E. MUNOZ-SERRANO, L.C. PITCHFORD, CPAT, Toulouse, N. SADEGHI, LSP, Grenoble, M. TOUZEAU, LTM, Grenoble — In this communication, we will summarize results of a joint experimental/modeling project whose purpose is to evaluate the feasibility of generating high yields of singlet delta (1D) metastable oxygen molecules in a microcathode sustained discharge (MCSD), a discharge configuration in which a microhollow cathode discharge is used as a plasma cathode with a third electrode being placed 0.5-1 cm away. From electrical and optical measurements and from modeling (presented in more detail in companion posters at this conference), we deduce the gas temperature, the [O] density profile, the spatial distribution of O₂(singlet sigma), the spatial distribution of the O₃, and the yield of O₂(1D) as determined from IR emission at points downstream from the discharge. These quantities are compared with results from a 2D quasi-neutral model. The baseline conditions are 10% O₂ in Ar at a total pressure of 50 torr, discharge currents on the order of 1 mA, and for a 200 micron microhollow cathode discharge diameter. This communication will focus on the intercomparison of results from the different diagnostics and from the model.

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Date submitted: 16 Jun 2006

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