

Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

On the reaction rates in the low pressure nitrogen discharge JON TOMAS GUDMUNDSSON, EYTHOR GISLI THORSTEINSSON, University of Iceland — We use a global (volume averaged) model to study the dissociation of the nitrogen molecule and the role of metastable species in a low pressure (1 - 100 mTorr) high density nitrogen discharge. The collisional energy loss per electron ion pair created is evaluated for the nitrogen atom and the nitrogen molecule. We explore and compare the reaction rates for the creation and destruction of the positive ions N^+ and N_2^+ , the atomic nitrogen in the ground state $N(^4S)$, the metastable atom $N(^2D)$ and the metastable molecule $N(A^3\Sigma_u^+)$. Furthermore, the dissociation mechanism in the nitrogen discharge is investigated as a function of power and pressure. The discharge is dominated by atomic nitrogen at low pressure and by molecular nitrogen at the higher pressures.

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Date submitted: 13 Jun 2008

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