Abstract Submitted for the GEC14 Meeting of The American Physical Society

Transport Properties of Negative Ions in HBR Plasmas VLADIMIR STOJANOVIC, Institute of Physics, University of Belgrade, P.O. Box 68, 11080 Belgrade, Serbia, NENAD IVANOVIC, Vinca Institute for Nuclear Science, University of Belgrade, P.O. Box 522, 11000 Belgrade, Serbia, MARIJA RADMILOVIC-RADJENOVIC, ZORAN RASPOPOVIC, ALEKSAN-DAR BOJAROV, ZORAN PETROVIC, Institute of Physics, University of Belgrade, P.O. Box 68, 11080 Belgrade, Serbia — Low temperature plasma in halogenated gases is standard environment for dry etching of semiconductors. Amount of negative ions in HBr plasmas determines electronegativity so modeling etching devices requires data for an ion transport properties. In this work we present cross section set for Br^- ions in HBr assembled by using Denpoh-Nanbu theory [1]. The threshold energy values were calculated by known heats of formation. The calculated total cross section accounts for ion-induced-dipole and ion-permanent-dipole interaction by using the local-dipole model. The total cross section was corrected to fit the reduced mobility obtained by SACM (Statistical Adiabatic Channel Model) approximation. Existing cross section measurements [2] were used to scale calculated cross sections. Finally, we used Monte Carlo method to determine transport parameters for Br^- as a function of reduced electric fields that can be used in fluid and hybrid plasma models.

 K. Denpoh and K. Nanbu, J. Vac. Sci. Technol. A (1998) 16 1201-1206.
R. L. Champion, L.D. Doverspike, M.S. Huq, D. Scott and Y. Wang, J.Chem.Phys. (1988) 88(9) 5475.

> Zoran Petrovic Inst of Physics

Date submitted: 13 Jun 2014

Electronic form version 1.4