

Abstract Submitted
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Production of hyperthermal neutrals on surfaces¹ TATIANA BABKINA, TIMO GANS, UWE CZARNETZKI, Institute for Plasma and Atomic Physics, CPST, Ruhr-University Bochum, Germany, D.A. KOVACS, Institute for Applied Plasma Physics, CPST, Ruhr-University Bochum, Germany, DETLEF DIESING, Institute of Physical and Theoretical Chemistry, University Duisburg-Essen, Germany — The production of hyperthermal neutrals through neutralisation of energetic ions impinging an electrode surface is investigated. Measurements and computer simulations are carried out for various species (H, D, He, Ar) on different surfaces (C, Al, Fe, Au, W) for energies up to a few hundred eV. All measured energy distribution functions of hyperthermal neutrals are in very good agreement with the simulation results. The fraction of reflected hyperthermal neutrals and the shape of their energy distribution function depend strongly on the mass ratio of the impinging ion and the surface material. A smaller ratio results in: more reflected particles, a higher mean energy, and a smaller energy spread. The produced hyperthermal neutrals can be used as a tuneable beam source with controlled energy distributions. Kinetically induced electron emission from metal surfaces is investigated for hyperthermal hydrogen and deuterium projectiles. The obtained results are in agreement with computer simulations and are well described by a model for the energy dissipation into the electronic system of the metal.

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