

**Effects of surface processes on the plasma parameters in low-pressure  
DC and RF discharges**

**Zoltan Donkó**

*Wigner Research Centre for Physics, Hungarian Academy of Sciences, Budapest, Hungary*

Processes taking place at surfaces that bound low-temperature plasmas may have appreciable effects on the plasma characteristics, via their influence of particle balances. Some of these processes are even absolutely essential for the maintenance of the plasma, e.g., secondary electron emission in DC discharges. In RF discharges the importance of secondary electrons depends on the operating conditions. Secondary electron emission is known to occur due to various species (ions, photons, fast neutral, and metastables), of which the importance varies significantly with discharge conditions and of which the yields depend strongly on surface properties (presence of impurities or an adsorbed gas layer). Knowledge of secondary yields for various materials and for a wide range of conditions is fairly incomplete. The sticking / reflection of charged and excited species also influences particles' densities in different ways. As to electrons, their significant fraction can be reflected from surfaces, especially at low energies. At higher energies electrons can also induce emission of secondaries. Regarding excited species, their recombination probability at the surfaces can alter remarkably the discharge properties via the chemical reactions in which they participate. This effect is illustrated with the example of singlet delta oxygen (metastable) molecules in capacitively-coupled radiofrequency plasmas.