Coherent set of electron cross sections for argon L.L. ALVES, C.M.
FERREIRA, IPFN/IST-UTL, Lisbon, Portugal — This paper presents a coherent
set of electron impact cross sections for argon [1] (elastic momentum-transfer, in-
elastic for the excitation of 37 levels Ar(4s,4p,3d,5p,4d,6s) and ionization), which
was recently uploaded onto the LXcat IST-Lisbon database [2]. The cross section
set was validated by comparing calculated swarm parameters (electron mobility
and characteristic energy) and rate coefficients (Townsend ionization coefficient and
direct + cascade excitation coefficients to the 4s and 4p states) with available ex-
perimental data, for $E/N = 10^{-4} - 100$ Td and $T_g = 300$, 77 K. The validation
procedure involves the solution to the homogeneous two-term electron Boltzmann
equation, resorting to three different solvers: (i) IST-Lisbon's; (ii) BOLSIG+ (v1.2)
with LXcat; (iii) BOLSIG+ (v1.23) [3]. The results obtained with these solvers
are compared to evidence the importance of certain numerical features related with
both the energy-grid (number of points, grid-type and maximum energy value) and
the interpolation scheme adopted for the cross sections. In particular, the lat-
ter can cause a 6% variation on the values of swarm parameters at intermediate
E/Ns. [1] A. Yanguas-Gil, J. Cotrino and L.L. Alves, J. Phys. D 38, 1588 (2005).
[2] http://www.lxcat.laplace.univ-tlse.fr/ [3] G.J.M. Hagelaar and L.C. Pitchford,
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