

Abstract Submitted
for the GEC13 Meeting of
The American Physical Society

Consistent set of electron cross sections for methane¹ L.L. ALVES, V. GUERRA, IPFN/IST-UTL, Portugal, C.D. PINTASSILGO, IPFN/FEUP, Portugal — This contribution presents a complete consistent set of electron-impact cross sections for methane (CH₄), recently made available on the IST-LISBON database with the LXCat website [1]. The set is based on the cross sections originally compiled and adjusted in [2] and first used in [3]. The elementary processes taken into account are elastic momentum-transfer, vibrational excitation of the (1,3) and (2,4) modes, total dissociation into neutrals, and ionization producing CH₄⁺ and CH₃⁺+H. For the latter two processes we have adjusted the partial ionization cross section of Chatham *et al.* [4] as to reproduce their measured total ionization. The new cross-section set is validated by comparing calculated and measured electron swarm parameters for $E/N = 0.1\text{--}400$ Td. A discussion of similarities and differences with sets of CH₄ cross sections from other databases is also presented.

[1] <http://www.lxcat.laplace.univ-tlse.fr/>

[2] C.D. Pintassilgo, Master Thesis, Instituto Superior Técnico (Universidade Técnica de Lisboa), 1996

[3] C.D. Pintassilgo *et al.*, Plasma Sources Sci. Technol. **8**, 463 (1999)

[4] H. Chatham *et al.*, J. Chem. Phys. **81**, 1770 (1984)

¹Work partially supported by FCT (Pest-OE/SADG/LA0010/2011).

L.L. Alves
IPFN/IST-UTL

Date submitted: 14 Jun 2013

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