

## Charge transfer processes in atom-molecule collision experiments

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Several elementary collisional processes are not due to direct electron impact but rather depend upon electron transfer. Electron induced chemistry is prevalent in many natural and industrial processes in a wide variety of media, including the formation of organic molecules within ice mantles on dusty grains in the interstellar medium [1]; the control of fluorocarbon plasmas used to produce silicon chips [2,3]; the chemical modification of absorbates using electron patterning [4] and scanning tunnel microscopy [5], and in edge and divertor plasmas of toroidal fusion devices [6], just to mention a few. Also, studying chemical reactions for molecular systems is relevant to understand radiation induced damage at the molecular level with the uttermost need to develop more efficient radiation therapies.

In the Lisbon laboratory we study gas phase electron transfer processes to molecules yielding ion-pair formation. The setup is of a crossed neutral atom-neutral molecule beam arrangement consisting of a potassium source, an oven, and a reflectron time-of-flight (TOF) mass analyser [7].

In this presentation we will address some of our most recent experimental achievements in anion formation by electron transfer experiments from collisions of neutral potassium atoms with key relevant molecules and their potential relevance to fusion plasmas. Relative cross-sections as a function of the centre-of-mass system will be presented and the dynamics of negative ions discussed. The experimental uncertainty of systematic relative cross sectional values are typically 10-20%.

\* PLV and FFS acknowledge the Portuguese National Funding Agency FCT-MCTES through research grant UID/FIS/00068/2013 and researcher position IF-FCT IF/00380/2014. GG acknowledges partial financial support from the Spanish Ministerio de Economía y Competitividad (Projects No. FIS2012-31230 and FIS2016-80440); plimaovieira@fct.unl.pt.

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