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REFERENCE: Short Term Scientific Mission, COST P9
Beneficiary: Filipe Ferreira da Silva, New University of Lisbon
Host: Prof. Dr. Paul Scheier, University of Innsbruck, Innsbruck, Austria
Period: from 09/06/2007 to 15/06/2007 Innsbruck - Austria
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SCIENTIFIC REPORT

PURPOSE OF VISIT

During the course of this visit, I have joined the on going research work and got familiar with the experimental techniques available in the Innsbruck laboratory. The main goal was to look at the formation of negative ion yields from electron attachment experiments to some aminoacids, by taking advantage of an apparatus equipped with an electric field sector and a magnetic mass selector, appearance energies and also MIKE scans for the molecular fragments. Another purpose of the visit was also to establish an official link in order to arrange a long term stay for a postgraduate studies. I also had the opportunity to contact with all the PhD students and post-Docs, and though became familiar with the current research being developed.

DESCRIPTION OF THE WORK CARRIED OUT DURING THE VISIT

During the visit to the University of Innsbruck, I had the opportunity to join some of the on going measurements with three PhD students, Phillip Sulzer, Elahe Alizadeh and Masoomeh Mahmoodi-Darian. Most of the work I have been involved consisted on getting familiar and also helping with some maintenance procedures that were happening, with the special attention for the CELIA monochromator and quadrupole mass detection system. Therefore, I spent some time attending Philip Sulzer in dissociative electron attachment (DEA) measurements on trinitrotoluene and Elahe Alizadeh with whom most of the work carried out during my stay has been developed. The CH5 machine has been used to look at the negative ion formation of dimethyl glycine in dissociative electron attachment processes in a energy range from 0 to 15 eV.

Another set of experiments in CH5 have been obtained in nitromethane DEA in the same energy range. The main reason regarding these investigations on nitromethane are the recent measurements in Paulo Limao-Vieira's research group in Lisbon on atom-molecule collisions with these molecular targets, were new fragmentation has been observed and the role of the internal energy conversion has led to a series of non-conclusive answers. Therefore, and bearing in mind a recent contribution on DEA to nitromethane from Pauls Scheier's group back in 2002, with the high mass resolution available in CH5, was possible to re-measure those ionic yields and the ability to spot new low intensity anions that have been not observed before. These measurements include also MIKE scans for metastable decays.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

Throughout my visit to the lab, it was possible to get a complete spectra of nitromethane between 0 – 15 eV. These spectra include mass scans and MIKE scans for some fragments.

- Negative ion yields of dimethyl glycine and nitromethane;
- Mass, appearance energy and also MIKE scans for some of the nitromethane molecular fragments were obtained.

FUTURE COLLABORATION WITH HOST INSTITUTIONS

Due to the link with the Innsbruck laboratory, the above mentioned work will be explored in the near future with other molecular targets.

PROJECTED PUBLICATIONS/ARTICLES RESULTING OR TO RESULT FROM THE STSM

The results obtained to nitromethane will certainly be worked up in order to prepare at least one joint publication, to be submitted to an international journal as soon as possible.

Filipe Ferreira da Silva

Lisbon, 3rd July 2007.

CONFIRMATION BY THE HOST INSTITUTE OF THE SUCCESSFUL EXECUTION OF THE MISSION

Prof. Dr. Paul Scheier

Innsbruck, 3rd July 2007.