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REFERENCE: Short Term Scientific Mission, COST P9
Beneficiary: Paulo LIMAO-VIEIRA, New University of Lisbon
Host: Dr. M-J Hubin-Franskin, University of Liège, Liège, Belgium
Period: from 20/08/2004 to 27/08/2004 Place: Liège - Belgium
Reference code: COST-STSM-P9-00206

SCIENTIFIC REPORT

PURPOSE OF VISIT

This purpose of the visit was to establish the first meeting and joint collaboration research work between the *Laboratoire de Spectrsocopie d'Electrons Diffuses*, University of Liège, Belgium and the *Departamento de Fisica*, Universidade Nova de Lisboa, Portugal. I was particularly interested to start studing the spectroscopy of biomolecules by the EELS technique. The Belgian group that has a proved experience in the study of electron scattering processes, has two different set-ups: one for studying the electronic state spectroscopy of valence shell and the other for inner core shells. It has also a photoelectron spectrometer, where the information provided is extremely useful to characterise the Rydberg and ionic states.

DESCRIPTION OF THE WORK CARRIED OUT DURING THE VISIT

During my visit to Dr. Marie-Jeanne Hubin-Franskin's laboratory, I performed joint experiments on the electron energy loss spectroscopy (together with Dr. Alexandre Giuliani) and HeI photoelectron spectroscopy (together with Prof. Jacques Delwiche) of c-C_4F_8 (perfluorocyclobutane), c-C_5F_8 (octafluorocyclopentene) and acetic acid.
Since no data on the ionisation energies for both cyclic compounds is available (with the exception of a recent threshold photoelectron measurements for c-C_4F_8), we performed He(I) photoelectron measurements in order to characterise the ionic states and assign the Rydberg series found in previous high-resolution VUV photo-absorption measurements obtained at the Institute for Storage Ring Facilities, University of Aarhus, Denmark.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

- The first obtained He(I) photoelectron spectra for c-C_4F_8 and c-C_5F_8;
- High resolution valence shell EELS for both cyclo compounds and acetic acid at pseudo-optical conditions;
- High resolution He(I) photoelectron spectrum for acetic acid.

FUTURE COLLABORATION WITH HOST INSTITUTIONS

Joint collaboration is ongoing with the host institution and is planed for the near future the study of the electronic state spectroscopy of atmospheric interest molecules and biomolecules. Quantum chemical calculations on the electronic excitation energies for the molecules studied during my visit are planned in close collaboration with a theroretical research group.

PROJECTED PUBLICATIONS/ARTICLES RESULTING OR TO RESULT FROM THE STSM

At this moment at least two joint publications are being prepared to be submitted to international journals shortly.

Dr. Paulo Limao-Vieira

Lisbon, 25th September, 2004.

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

The visit of Dr. Paulo Limao-Vieira was underdone with success and according to the planed activities.

Dr. Marie-Jeanne Hubin-Franskin

Liège, 25 th September 2004.