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Lisbon, 16th February 2009

REFERENCE: Short Term Scientific Mission, COST CM0601
Beneficiary: Mr. Gonçalo Martins, New University of Lisbon (PT)
Host: Prof. Paul Scheier, Institut für Ionenphysik und Angewandte Physik
Period: from 07/02/2009 to 14/02/2009 Place: Innsbruck (AT)
Reference code: COST-STSM-CM0601-04453

SCIENTIFIC REPORT

PURPOSE OF VISIT

This scientific mission to the Institut für Ionenphysik und Angewandte Physik, University of Innsbruck was devoted to experimental studies in electron interactions with clusters of L-serine embedded in super fluid helium droplets. This visit allowed also establishing a contact with Prof. Scheier's group and his co-workers with the purpose of a near future integration as a PhD student or as a regular visitor to perform joint research under the Austrian-Portuguese exchange link.

DESCRIPTION OF THE WORK CARRIED OUT DURING THE VISIT

During the STSM, I got acquainted with the activities around in the lab especially with the CH5 set-up and have been involved in some electron impact ionisation and electron attachment measurements on L-serine (aminoacid). Some preliminary investigations on electron attachment to oxygen embedded in He clusters for O_3^- formation were also performed. As far as recent data on acetic acid is concerned, some assignments and fitting adjustments have been made (see Fig. 1 and Fig. 2).

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The results on acetic acid were carefully analysed and a publication is expected to be submitted shortly to an international journal (some results are shown in appendix 1). Electron attachment measurements to L-serine and oxygen have been performed on helium droplets as well. Therefore, the main achievements on the experimental work carried out on the CH5 machine were:

1. Preliminary assignments of the negative and positive fragment ions of acetic acid, L-serine and oxygen;
2. Oxygen clusters resonance energy profiles analyses;

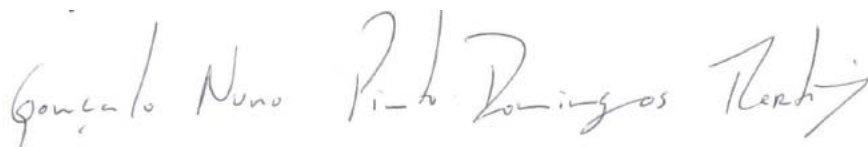
FUTURE COLABORATION WITH THE HOST INSITUATION

The joint research program between the two institutions will continue mainly in DEA studies in the Innsbruck laboratory devoted to biological related molecules.

PROJECTED PUBLICATIONS/ARTICLES RESULTING OR TO RESULT FROM THE GRANT

As previously referred in this report, one joint publication on the acetic acid data is expected to be submitted shortly to an international journal. Some other publications may emerge in the future, particularly on the studies related to L-serine and oxygen.

Lisbon, 18th February 2009

A handwritten signature in cursive script, reading "Gonçalo Nuno Pinto Domingos Martins". The signature is written in dark ink on a white background.

Gonçalo Nuno Pinto Domingos Martins

APPENDIX 1- Recent results and data analyses from the STSM to Lisbon

FIGURE 1) – Positive mass spectra of Acetic acid clusters

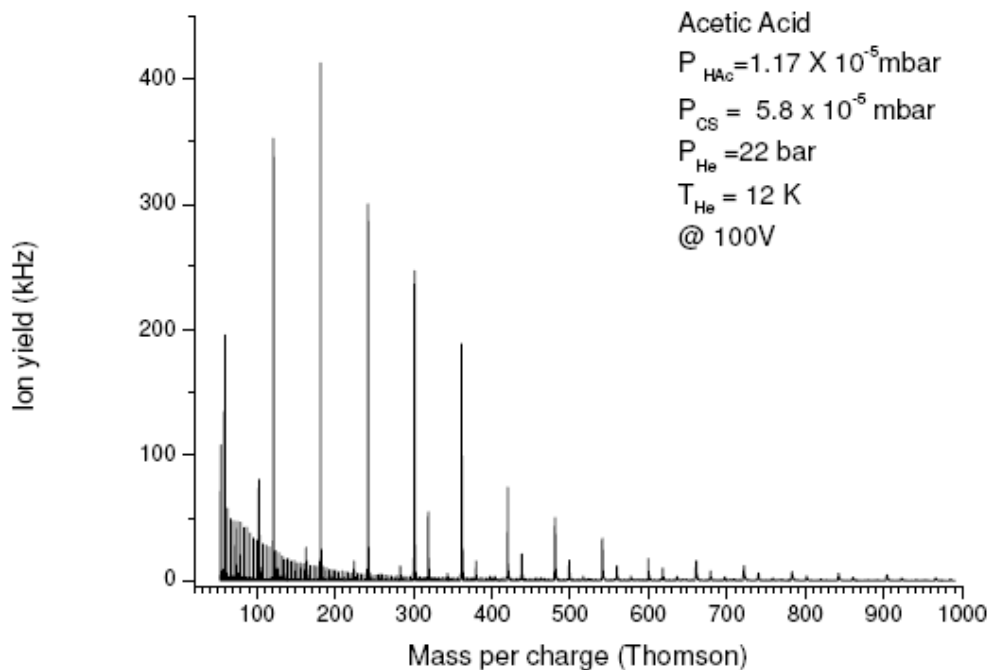


FIGURE 2) – Energy scan of some anionic fragments of Acetic Acid (0 - 50eV)

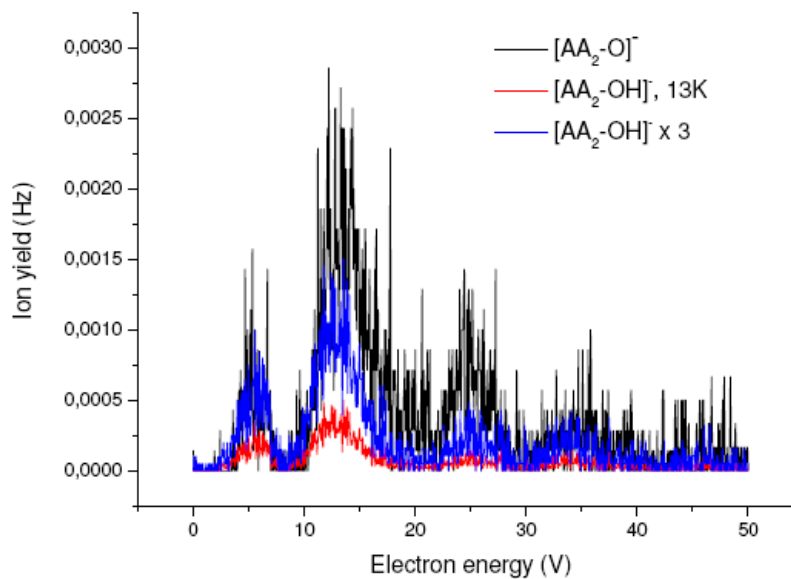


FIGURE 3) – Positive mass scan of L-serine (from dimer (2 units) until octomer (8 units))

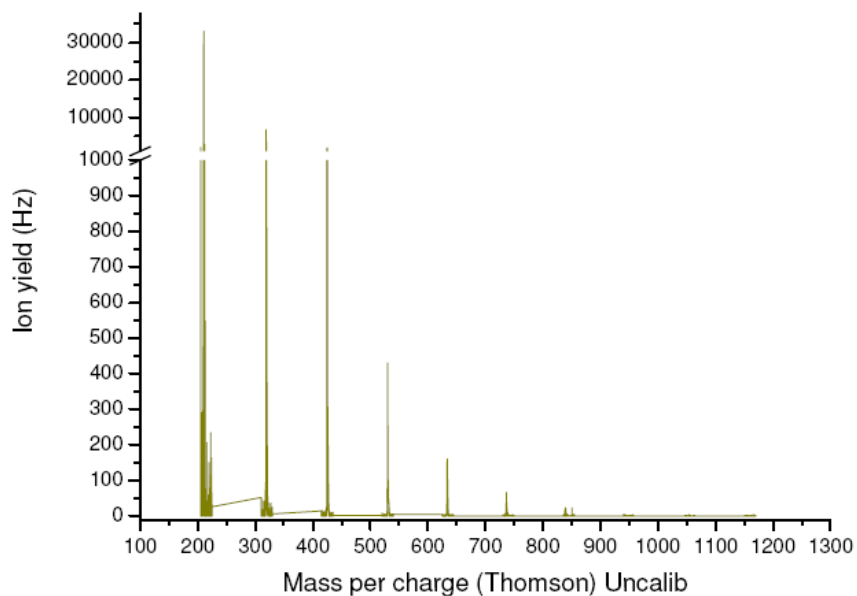


FIGURE 4) – Negative mass scan of L-Serine (dimer and trimer masses)

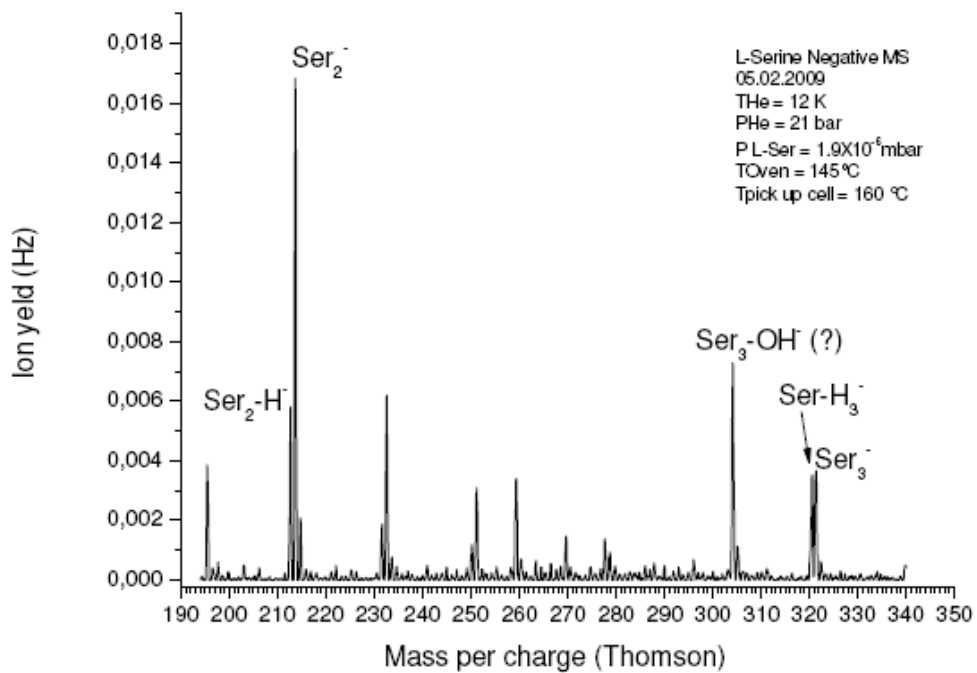


FIGURE 5) - Negative mass spectra of L-Serine (between dimer and pentamer range)

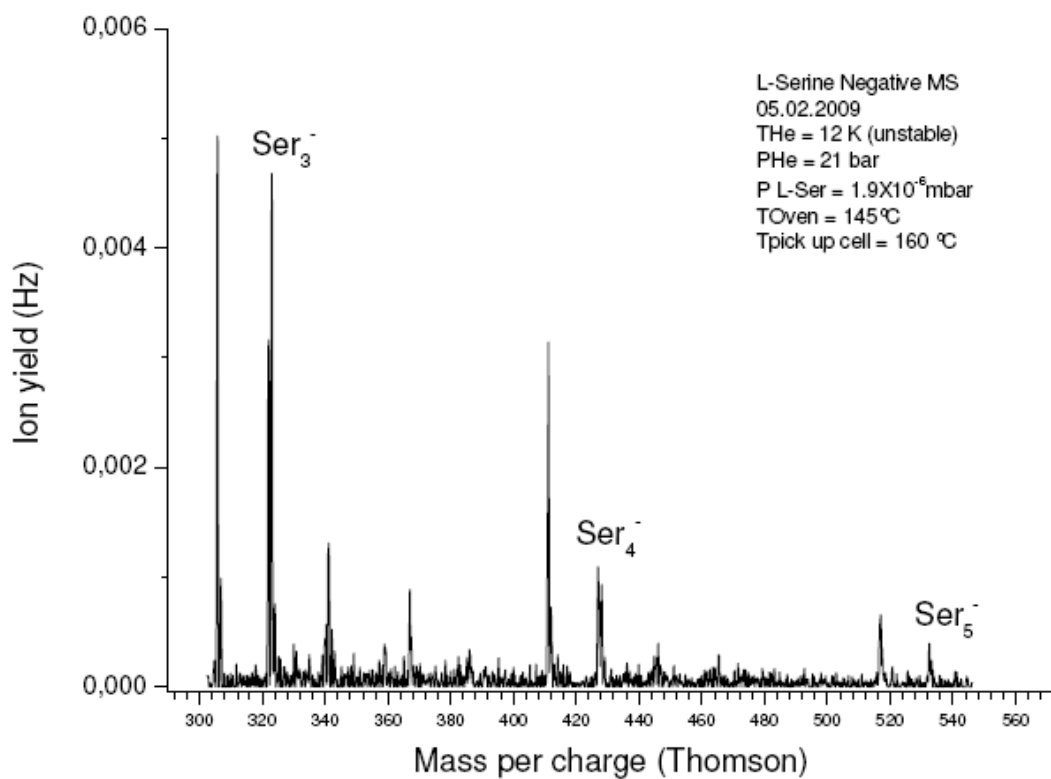


FIGURE 6) – Energy scan from a negative fragment of L-Serine

