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Beneficiary: Filipe Ferreira da Silva, Institut für Ionenphysik und Angewandte Physik
Host: Dr. Alexandre Giuliani, Synchrotron Soleil
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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 technique of Atmospheric Pressure Photoionization (APPI) available at the Synchrotron Soleil. The main goal was to learn how to make use of the thermospray technique, and also to have the opportunity to take part in the measurements of some amino acids such as alanine, valine and peptides such as glycyl-alanine and alanyl-alanine. Positive and negative mass spectra were recorded and could be used in the future to compare this technique with electron attachment with amino acids embedded in Helium droplets.

DESCRIPTION OF THE WORK CARRIED OUT DURING THE VISIT

During the visit to the Synchrotron Soleil, I had the opportunity to be in contact with the apparatus where the measurements with APPI technique are on going. The aim of this visit was to learn about this technique concerning sample preparation, the use of dopants, solvents and also to measure and analyze the recorded mass spectra.

The measurements carry out during this visit were focused on amino acids and peptides. The experimental results were obtained using the Photospray APPI source (Applied Biosystems). The APPI source is assembled in a hybrid quadrupole time-of-flight mass spectrometer, which is also part of the analyzing system of the beam line of the DISCO Synchrotron Soleil devoted to this sort of experiments. The main reason regarding this visit deals with the fact that the Institute of Ion Physics and Applied Physics of the University of Innsbruck is currently interested in joining and broadening the research regarding biomolecular systems on collaborative joint projects as far as APPI technique is concerned, and also that this visit is being as been very important regarding my scientific achievements of my PhD research with biomolecules, such as amino acids.

Positive and negative mass spectra were recorded using different conditions, such as some radiation sources (krypton and argon lamps) to different energy ranges and also different dopants as acetone and anisole.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

Throughout my visit to the Synchrotron Soleil, it was possible to get a spectrum of Alanine, Valine Leucine, Phenylalanine, L-Triptophyl-L-Triptophane, L-Leucine-D-Leucine, L-Analyl-L-Alanine, L-Analys-L-Valine, Glycyl-L-Proline, Glycul-L-Alanine and β -Alanylglycine, using acetone and anisole as dopants. Krypton lamp has been used. With this combination of dopants and lamp was possible to work in the energy range 0 – 3 eV. The spectrum includes positive and negative mass scans.

FUTURE COLLABORATION WITH HOST INSTITUTIONS

With these visit was possible to start a collaboration with Synchrotron Soleil, and the above mentioned work will be explored with other aminoacids with special interest and relevance for my PhD studies and also with highest molecular level, e.g. polypeptides.

PROJECTED PUBLICATIONS/ARTICLES RESULTING OR TO RESULT FROM THE STSM

The novel results obtained for this set of biomolecules will certainly be used and prepared for a planned joint publication, to be submitted to an international journal as soon as possible.



Filipe Ferreira da Silva

Innsbruck, 21st April 2008.

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



Dr. Alexandre Giuliani

Gif-sur-Yvete, 21st April 2008.