

SPECS XPS/UPS System with PHOIBOS 150 Analyzer

X-Ray Photoelectron Spectroscopy (XPS) is a surface analysis technique that can provide elemental and chemical bonding information from the top surface of the sample (first few nanometers). Elemental characterization of the surface can be achieved, and the nature of the chemical environment can be obtained from the differences in binding energy of the elements. For reliable sample analysis the purity of the samples is essential. The instrument is equipped with Al and Mg X-ray sources which provide photons with 1486.6eV and 1254.6eV energy, respectively.



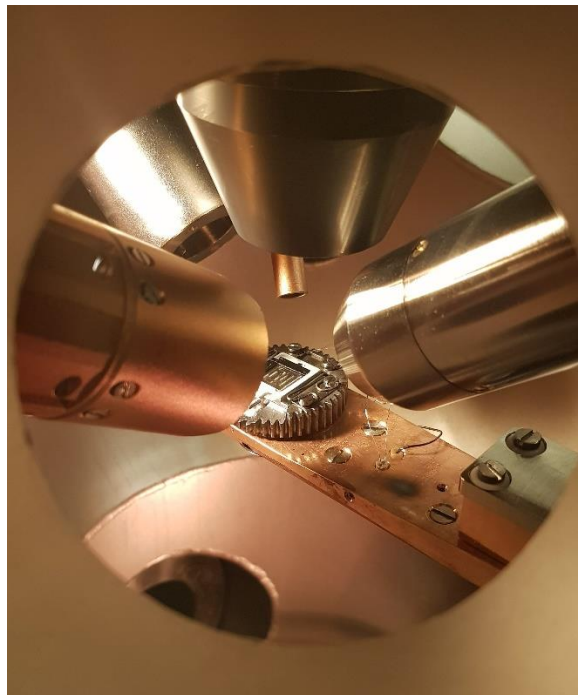
The SPECS XPS UHV system

Specifications:

Sources

- Al/Mg dual anode (max 200W power output)
- VUV He(I) or He(II)

Capabilities	<ul style="list-style-type: none">• Ar ion gun for sputtering of surface (up to 5kV)• 9 channeltron detector• Sample heating and cooling (100K – 900 K)• Electron flood gun for charge neutralization
Analyzer	<ul style="list-style-type: none">• PHOIBOS 150, typically better than 10 meV resolution
Specimen Requirements	<ul style="list-style-type: none">• Ultra high vacuum compatible• Sample size 1cm x 1cm• Powder samples can be analyzed



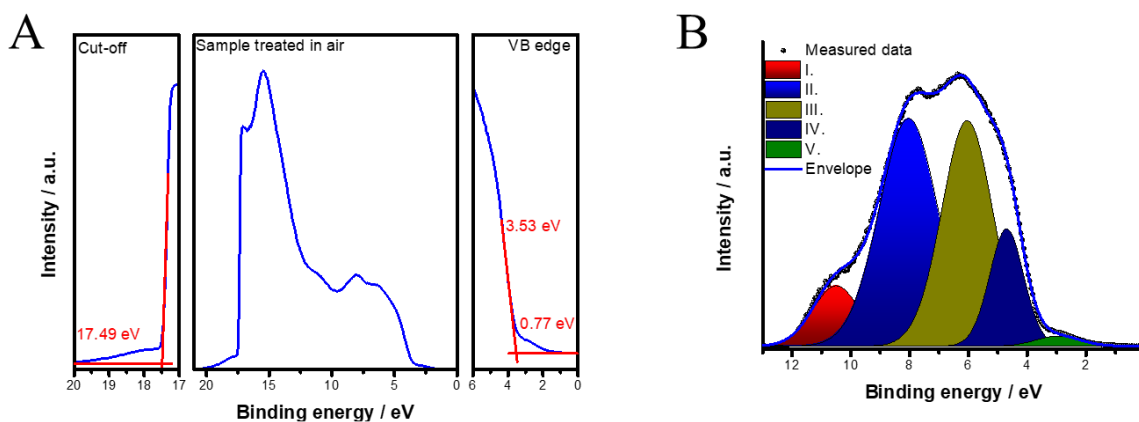
Sample is inserted in the analysis chamber

The SPECS XPS is equipped with a UVS 10/35 VUV lamp to perform ultraviolet photoelectron spectroscopy measurements. The He I/II UV source provides photons with energies of 21.22eV and 40.81eV. With the help of UPS spectroscopy, we could determine the work function of the selected semi-metal or metal samples or reveal the density of states at the highest

occupied region of the valence band (DOS). This technique is required samples with well-defined surface structures and low surface roughness. Ultra-violet photoemission spectroscopy (UPS) for measurements of valence bands and work functions with a 21.2eV excitation source.



Schematic view of the SPECS UVS 10/35 lamp and after the installation in the SPECS XPS



A: spectra of TiO₂ He(I) UPS, the sample was biased at 10.0V. B: background corrected and deconvoluted UPS spectra of the TiO₂

If your research interests require access to this XPS/UPS system and have any questions on the instrument capabilities, please contact Professor Zoltán Kónya (konya@chem.u-szeged) or the technical contact Gyula Halasi (halasigy@chem.u-szeged.hu).

Sample submission can be done through the online form.