

# 学术报告

题目: Recent applications and results  
in Near Ambient Pressure XPS –  
In-situ cell designs for liquid  
environments

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# Recent applications and results in Near Ambient Pressure XPS – In-situ cell designs for liquid environments

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## **Abstract:**

Modern devices are often only functional in environments far away from ultrahigh vacuum, still being the standard operation conditions for all Surface Science techniques. In parallel the importance of surfaces for the correct device operation is continuously increasing due to miniaturization down to the nanoscale. To contribute to advanced materials analysis in future means using Photoelectron spectroscopy combined with Scanning Probe Microscopies and related techniques in the generic or near generic device environments. This means high, elevated or near ambient pressures of defined working gas mixtures, liquid media, potentials or magnetic fields applied. Also extremely low or high temperatures might be necessary. In past all standard Surface Science Techniques did not work under these extreme environments. As a route to in situ sample analysis Near Ambient Pressure XPS has already been used for a longer time with tremendous success. Nowadays steps are made to utilize this analysis technique not only at synchrotrons and in academic environments, but also as standard analysis tools in user friendly laboratory systems. This work summarizes and presents existing solutions and future development routes to new instruments and materials analysis methods being functional under these working conditions. Opportunities and limits will be discussed from the perspective of a supplier of scientific instruments. Finally applications, examples and results from existing In situ methods like high pressure treatments cells, complete High Pressure or Near Ambient Pressure Photoelectron Spectroscopy or Scanning Probe Microscopy Systems (NAP-PES or NAP-SPM), liquid and electrochemical cells, Liquid sample “manipulators“, and concepts and status of equipment working in highest or lowest temperatures, high magnetic fields and static or dynamic potentials will be demonstrated.