

## AMBIENT PRESSURE XPS AT THE MAX IV LABORATORY

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In its first stage of operation the MAX IV Laboratory will host two undulator beamlines for ambient pressure x-ray photoelectron spectroscopy (APXPS) [1]: the SPECIES beamline on the 1.5 GeV ring [2] and the HIPPIE beamline [3] on the 3.0 GeV ring. Together these two beamlines will cover the energy range from around 27 eV up to 2 keV. This allows not only the studies of core-levels on low-Z elements, but also studies on the valence bands, the L-shell levels of late 3d transition metal elements and elements such as Zn, Ga, and As. APXPS studies in this energy range give an excellent possibility for studying phenomena such as catalysis, corrosion and electrochemistry on solid-vapour and liquid-vapour interfaces both *in situ* and *in operando*.

The two beamlines have a number of reaction cells that can be docked onto the analyser and changed quickly for APXPS experiments optimized for different types of conditions [4]. Examples of such cells include ones for catalytic reactions, investigations on the chemistry of sulphur compounds, liquid-vapour interfaces, electrochemistry experiments, controlled atmospheres, high temperature surface treatments, biological samples, and *ex-situ* reactivity measurements at pressures up to 1 bar. The cells generally allow maximum vapour or gas pressures up to 25-50 mbar to be used during the experiments.

In this poster we present the basic parameters of the two beamlines, the end stations, the various reaction cells already in use and under development as well as other related equipment for APXPS experiments at the MAX IV Laboratory.

- [1] D. E. Starr, Z. Liu, M. Hävecker, A. Knop-Gericke, H. Bluhm, Chem. Soc. Rev., **42**, 5833 (2013)
- [2] <https://www.maxiv.se/node/1505>
- [3] <https://www.maxiv.se/hippie>
- [4] J. Schnadt *et al.*, J. Synchrotron Rad., **19**, 701-704 (2012)