HiPP LAB

Advanced APXPS measurements

The HiPPLab is a high-performance, laboratory-based system that includes a powerful small-spot monochromated X-ray source and a state-of-the-art HiPP-3 analyser. It is designed with ease of use, high count rate and stability as the number one priority, and will serve as an efficient, turnkey workhorse in both labs and shared facilities. The HiPPLab effectively tackles a wide range of scientific questions with applications covering catalysis, fuel cell analysis, battery research and involving the investigation of solid-gas phase, solid-liquid and gas-liquid interfaces.

The smart cone design of the HiPP-3 Analyser results in a stable and efficient performance of the system with high electron transmission that is suitable for multiple applications. Figure 2 shows measurement results from N_2 gas over Ag sample. The snap-shot mode allows for fast data acquisition during changes of system parameters. Figure 3 shows spectra raw-data from the drying process of liquid H_2O on Si.

The included MISTRAL software allows for system remote control of valves, temperature and turbo pumps as well as pressure reading (compare Figure 4). Together with the PEAK spectroscopy control and acquisition software the system becomes user intuitive and highly flexible to customer-wished adaptations. Possible system expansion include glove box, laser heating, electrochemical cells, gas reaction cell and prep. chamber.

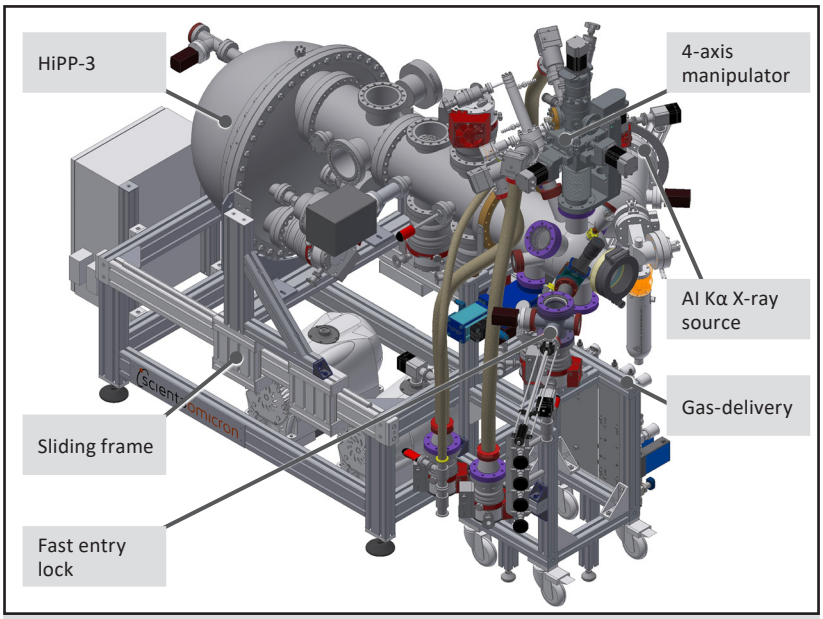

Figure 1: Example of a bespoke customer example where the system is equipped with a fast entry lock and a gas delivery system.

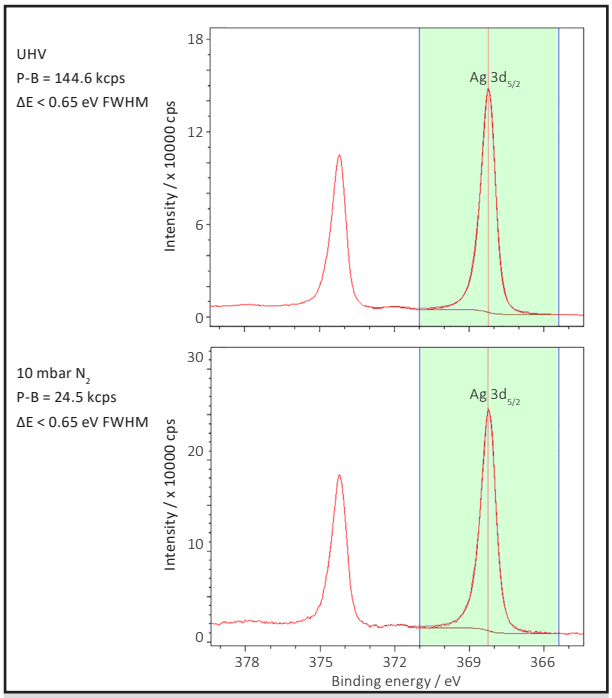

Figure 2: High quality Ag 3d APXPS spectra obtained using the HiPPLab. The spectra were acquired using 0.3 mm inlet aperture and N_2 background pressure. The figure indicates the peak (P) minus background (B) intensity being 144.6 kcps at UHV, 24.5 kcps at 10 mbar, 2.2 kcps at 25 mbar and 0.4 kcps at 35 mbar.

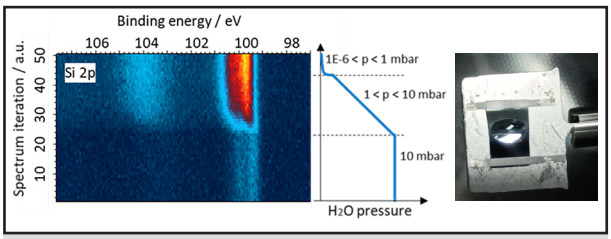

Figure 3: APXPS spectra following the drying process of a liquid water droplet over Si in H_2O background. Spectra are acquired using snap-shot mode with Swift acceleration and a 16 eV wide energy window and 60 sec. dwell time.

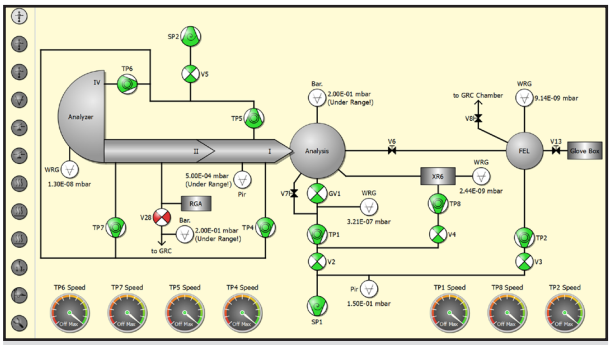

Figure 4: Example of a MISTRAL user interface to control and observe system parameters, e.g. gas feed, temperature, pump status.