

DEVELOPMENT OF A LAB-BASED IN-SITU NAP-XPS SYSTEM FOR ELECTRO-CATALYSIS RESEARCH

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We present the development of a lab-based near ambient pressure X-ray photoelectron spectrometer (NAP-XPS) that is specially designed for investigations of electro-catalytic systems under realistic operating conditions. The new system allows catalytic measurements in flow mode with online reaction analysis while simultaneously characterising in-situ surface composition and electrochemical properties.

Key requirements are a flow reactor environment that can be operated up to 10 mbar H₂ (or other gas mixtures) with operating temperatures between RT and 800°C (peak temperatures of 1000°C possible). The sample stage has special design to allow simultaneous characterisation by impedance spectroscopy and to obtain current-voltage curves. For electro-catalytic experiments, the sample surface can be polarized. The attached gas analysis allows to follow catalytic reactions in real time by MS.

In addition, we present additional software implementation developed in LabVIEW for control and safety (interlocks) as well as for user-friendly data processing.

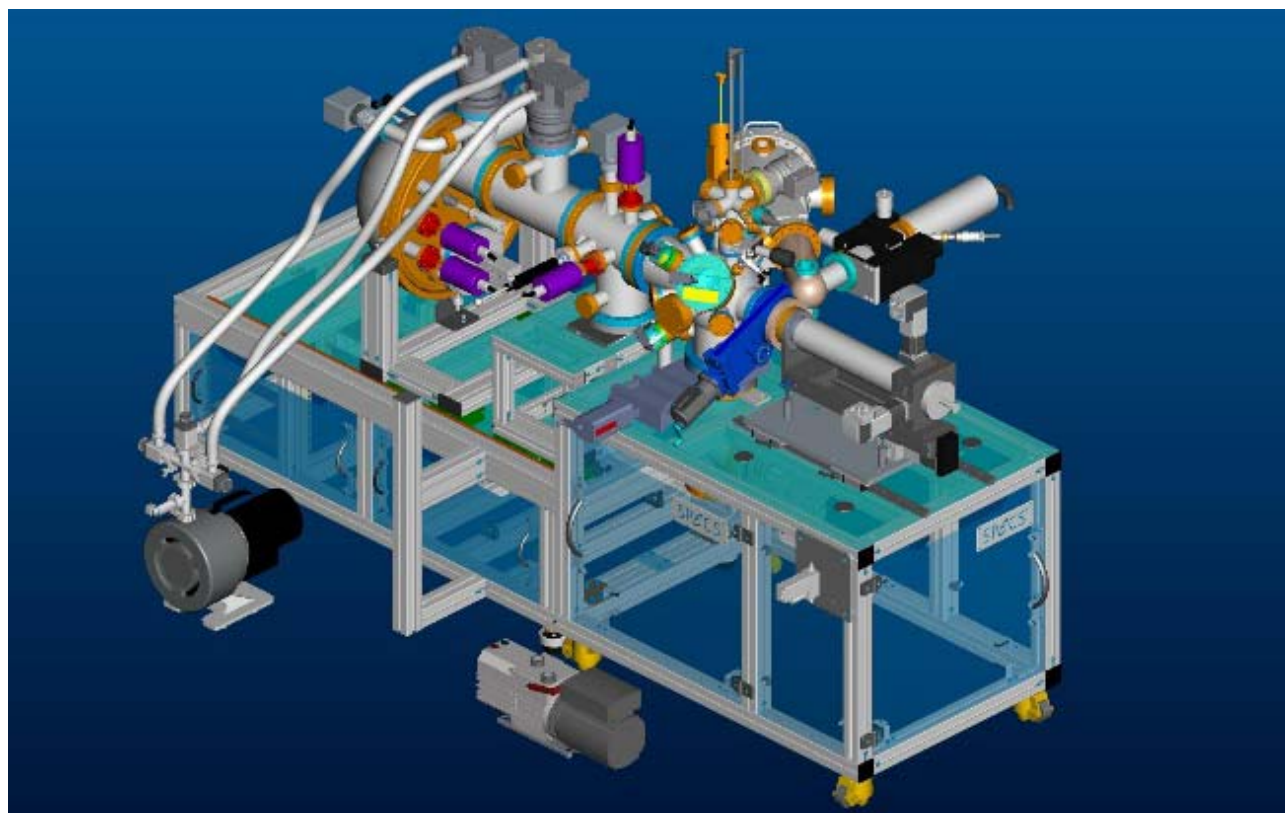


Figure 1: 3D Model of the in-situ NAP-XPS system

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