NanoESCA in all its states:

From 2D materials band structure imaging to chemical mapping of biological tissues

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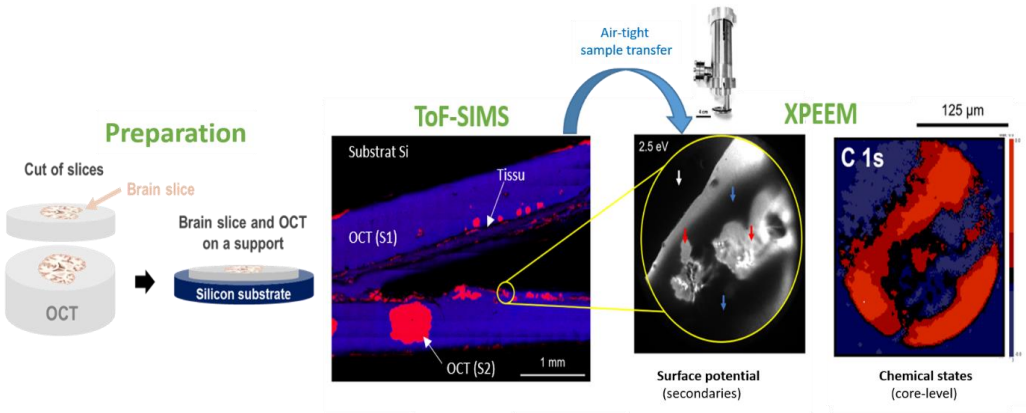
In this talk, we provide a snapshot regarding different application cases of photoemission electron microscopy using the NanoESCA in a user facility, namely, the Nanocharacterization Platform of CEA (French Authority for Atomic and Alternative Energies) in Grenoble, France. The instrument is under operation since 2006 and was improved over time to enable momentum microscopy with state-of-the-art resolutions, besides offering quantitative real space spectromicroscopy with both secondary and core-level electrons [1]. Here, we will illustrate the diversity of analytical cases which can be handled by the instrument for answering the needs of technological developments. For this, we will focus on two particular aspects. First, we will present recent works in the field of 2D materials, where we investigated the influence of the substrate on the electronic band structure of well-controlled monolayer WSe_2 and related heterostuctures for applications in photonics [2]. A second aspect of the talk will address the long-standing issue of biological samples analyzed by PEEM and its recent progress in the fields of sub-cellular imaging and analysis of tissues. To illustrate this, the case of surface potential and chemical state mapping of rat brain slices and related samples will be presented, highlighting the need for hybrid imaging methodologies with co-localization at the micron scale [3].

Figure 1: Photoemission microscopy of biological tissue providing physical insights complementary with molecular analysis from secondary ion mass spectrometry.



References

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