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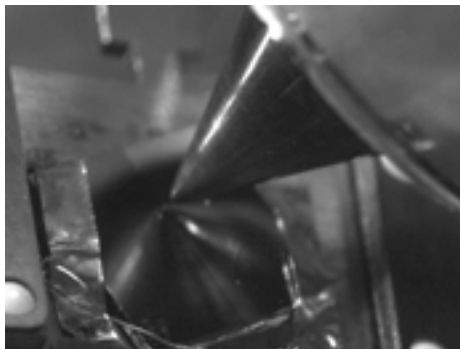
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Characterizing silicon/platinum-based catalytic motors with near ambient pressure photoemission

Self-propelled motors that can harvest chemical energy from their surroundings and convert it in mechanical energy are at the forefront of nanotechnology for their foreseen applications in environmental remediation and nanobiomedicine. In this context we have performed near ambient pressure photoemission (NAPP) studies of Pt/Si micromotor surfaces activated by oxygen plasma in water atmosphere at the NAPP endstation of the CIRCE beamline at the ALBA synchrotron near Barcelona. We have shown that the activated Pt films become reduced by the combined effect of the intense soft X-ray photon beam and condensed water. The reduction processes closely follows the inverse mechanisms found in electro-oxidation of platinum. In a first stage, the reduction of the Pt+4 and Pt+2 species with a parallel increase of the signals assigned to adsorbed oxygen and metallic platinum. In a second stage adsorbed oxygen desorbs increasing the metallic character of the surface. We

hypothesize that the observed reduction is mainly induced by the reactive species generated through the radiolysis of water.

**Biography**

Jordi Fraxedas obtained his PhD from the University Stuttgart, Germany and held a postdoctoral position at the European Synchrotron Radiation Facility, Grenoble, France and a researcher position at the European Laboratory for Particle Physics, Geneva, Switzerland. His research activity is focused on interfacial phenomena and surface science. He has published the books *Molecular Organic Materials: From Molecules to Crystalline Solids* (Cambridge University Press, 2006), *Water at Interfaces: A Molecular Approach* (Taylor and Francis CRC, 2014) and *Molecular Materials: Preparation, Characterization, and Applications* (Taylor and Francis/CRC 2017).

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