

#ICMolTalks

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Nanotecnologia (ICN2)*May 30<sup>th</sup> - 10:00h

📍 Assembly Hall - ICMol



## Abstract

### ***Spectroelectrochemical monitoring of active site cooperativity effects in electrocatalysts for sustainable chemicals***

Electrocatalysis has emerged as a promising process to store renewable energy into fuels and high added-value chemicals to decarbonise the energy and fine chemical sectors. As such, the both CO<sub>2</sub> reduction (CORR) and water splitting process to generate H<sub>2</sub> (HER) and O<sub>2</sub> are of particular interest, where the oxygen evolution reaction (OER) is the bottleneck of these processes. Replacing the OER for biomass oxidation presents with an opportunity to increase CORR and HER efficiencies, whilst producing high-added value chemicals.

The efficiency of these catalytic processes, when using metal-oxides, depends not only on the nature of the composition and nanostructure of the catalyst amongst others, but also on cooperative effects between metal centers to unlock different mechanistic pathways. Such variations in efficiency are closely related to the nature and availability of active sites, whose characterisation is not trivial. In this talk, I will present recent advances on the use of in-situ spectroscopic techniques, to shine light into the kinetics and reaction mechanism of OER and glycerol oxidation.

## Biography

Camilo graduated in Chemistry (2008) and M.Sc. in Materials (2011), completed his Ph.D. at Imperial College London, ICL (2019), obtaining the first prize for both, best M.Sc. and Ph.D. thesis at University of Bologna and ICL respectively. Until 2023, Camilo held a postdoctoral position at the Institute of Advanced Materials (INAM-UJI), where he studied the limiting kinetic and mechanistic factors of (photo)electrocatalytic reactions via in-situ techniques. He has co-authored >35 papers, including JACS and Nature Chemistry, with over 1700 citations. Currently, Camilo holds a senior postdoctoral position in the NanoESC Group, focusing his research on in-situ characterization of electrocatalysts for co-electrolysis.