

Probing the correlation of interfacial chemistry and performance of electrocatalysts by surface enhanced IR absorption spectroscopy

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Electrocatalysts play a key role in the interconversion of chemical and electrical energies, and there is an increasing demand for their rational syntheses. To meet such a requirement, as a starting point, it is necessary to understand the correlation between interfacial chemistry and electrocatalytic activity and durability of a catalyst. In this talk, I will introduce our efforts in developing in situ attenuate total reflection surface enhanced IR absorption spectroscopy (ATR-SEIRAS) to investigate electrocatalytic oxidation of small organic molecules on Pd and Pt-based catalysts at molecular level, with a focus on correlating the spectral features of surface and solution species with the resulting catalytic performances. I will also showcase that spectral feature change of a probe molecule may provide a hint for a new practical electrocatalyst through electronic property tuning.

Acknowledgement: Financial supports from the National Natural Science Foundation of China (21733004, 22002088 and 22002036) and the Shanghai Science and Technology Innovation Action Plan (22dz1205500) are highly appreciated.

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