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What our lab does:

- We characterize catalytic materials during reactions with an emphasis on surface characterization.
- We establish the catalytic structure-activity relationships to allow us to molecular design improved catalysts.

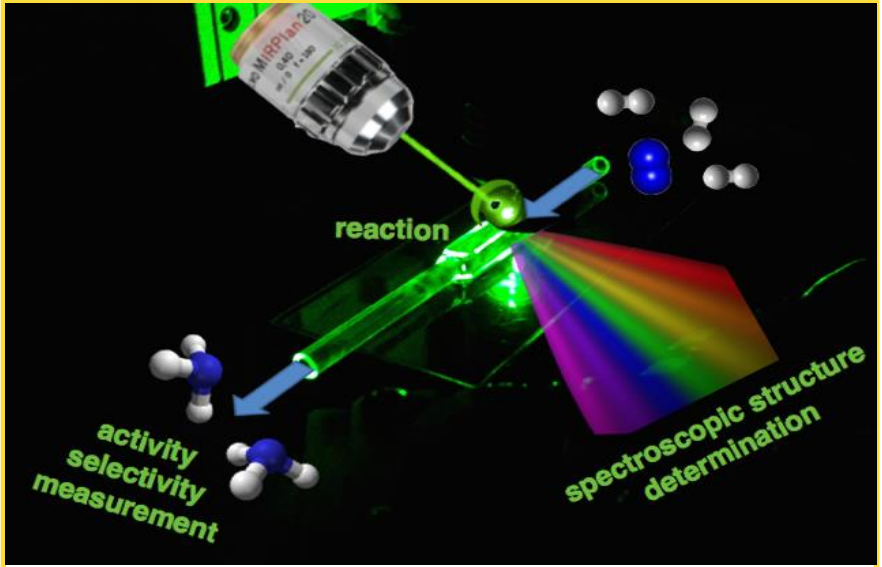
How we do this:

- Multiple spectroscopic techniques are used to access the desired surface information during reaction:
  Raman, IR, UV-Vis, Temp. Programmed Surface Reaction (TPSR), Near Atmospheric Pressure – X-ray photoelectron spectroscopy (NAP-XPS), High Sensitivity – Low Energy Ion Scattering (HS-LEIS), X-ray Absorption, NMR, EPR, ...

Why we are investigating this area:

- Catalysts contribute to the manufacture of products that account for ~25% of the U.S. GDP.
- New fundamental insights about catalysis have the potential to molecularly design improved catalysts and novel sustainable processes.

Apply *operando* molecular spectroscopy (simultaneous spectroscopic analysis of the catalyst and online detection of reaction products) to establish catalyst structure-activity relations.



1.) https://doi.org/10.1021/acscatal.1c06000
2.) https://doi.org/10.1021/acscatal.1c03792