

Energy Materials Laboratory (Ramot)**code:** 12-2017-1121[Brian Ashley Rosen](#), T.A.U Tel Aviv University, Engineering, Materials Science & Engineering Program

Design of nano-catalysts for energy storage and conversion applications. Heterogeneous catalysis for methane oxidation, CO₂ conversion, fuel cell catalysts (PEMFC, AMFC, SOFC)

Facilities/equipment/devices:

In-situ x-ray diffraction (Up to 900C in reactive environment) using a Bruker D8 Advance with Anton Parr XRK-900 reaction cell

Scanning electrochemical microscopy using Bio-Logic M470 SECM. Used for mapping of electrochemical properties and catalytic activity as a function of position

Temperature programmed reduction, oxidation, adsorption, desorption for powder/catalyst analysis.

BET surface area analysis

Industrial plug-flow catalytic reactor with in-line gas chromatography. Reactor up to 1000C, 9 ATM, and 1,800 L/h of gas-phase reactant flow. Used for industrial proof-of-concept for catalysts.

Technologies and/or services:

(in-situ) Crystallography, powder surface analysis, oxidation-reduction analysis, adsorption-desorption analysis, gas/solid-catalytic activity and stability analysis

Capabilities and specific areas of expertise:

Catalytic measurement, in-situ crystallography, electrochemical analysis

In-situ XRD allows for understanding crystallographic properties of the catalyst under reaction conditions. This is far superior to ex-situ XRD where the state of the catalyst during the reaction is treated as a "black box"

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