

# New Catalyst Paves the Path for Ethanol-Powered Fuel Cells

Beamlines: X18B

Technique: XAS

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**Motivation:** Commercialization of direct ethanol fuel cells has been impeded by ethanol's slow, inefficient oxidation even at the best electrocatalysts<sup>1,2</sup>. We synthesized a ternary PtRhSnO<sub>2</sub>/C electrocatalyst by depositing platinum and rhodium atoms on carbon-supported tin dioxide nanoparticles that is capable of oxidizing ethanol with high efficiency and holds great promise for resolving the impediments to developing practical direct ethanol fuel cells.

**Results:** Our experiments and density functional theory calculations indicate that the electrocatalyst's activity is due to the specific property of each of its constituents, induced by their interactions. These findings help explain the high activity of Pt–Ru for methanol oxidation and the lack of it for ethanol oxidation, and point to the way to accomplishing the C–C bond splitting in other catalytic processes.

