

BERKELEY CATALYSIS CENTER

Distinguished Lecture Series

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The McCollum Room

775-A Tan Hall

2-4 pm



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Methane Combustion by Supported PdO: From Fundamental Research to Commercialization and Back

ABSTRACT:

The November 2002 start-up of a 1.4-MW Kawasaki gas turbine with a Xonon® combustion module in Sonoma marks the first commercial application of a natural gas-fired catalytic combustion device for power generation after almost 30 years of R&D world-wide. The module in the 9.5-atm KHI-M1A-13X engine contains two foil monoliths coated with supported palladium oxide catalyst downstream of a lean pre-burner and highly efficient fuel/air mixer. PdO catalysts under operation for power generation exhibit many phenomena that are of academic interest and that represent practical engineering challenges: 1) both oxide and metallic phases present in the same monolith; 2) instability caused by hysteresis under phase transformation; 3) potential for substantial thermal coarsening; 4) sensitivity to air contaminants; 5) inhibition by water vapor over a broad temperature range; etc. This talk will review the status of commercialization efforts and the (hopefully contemporaneous) fundamental understanding of methane combustion by supported PdO.