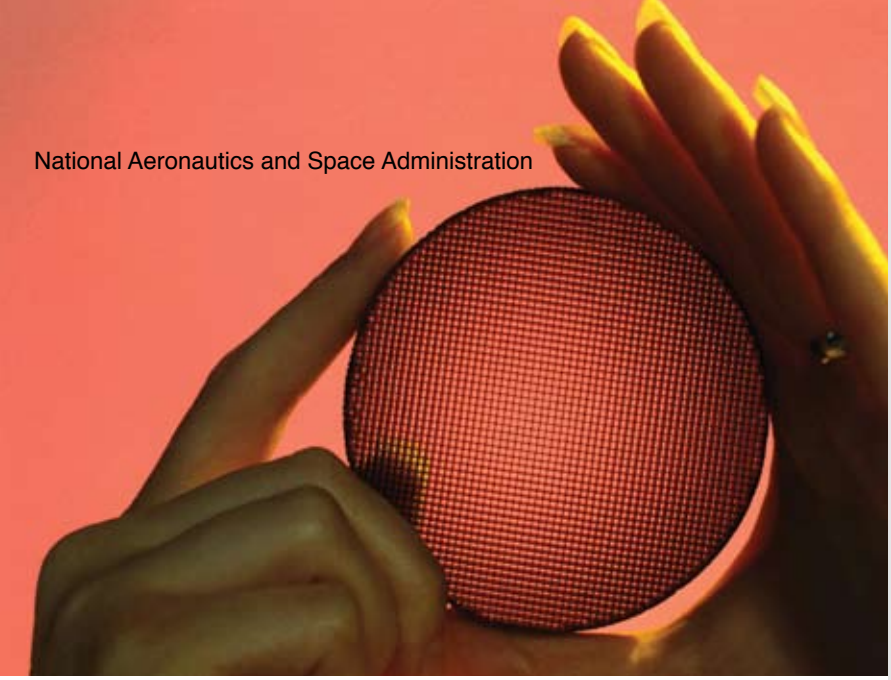

National Aeronautics and Space Administration

NASA Langley's

Low-Temperature Oxidation/Reduction Catalysts

Catalytic oxidation of carbon monoxide, formaldehyde, and other hydrocarbons, and NOx reduction, in air and process gas streams

NASA Langley researchers, in work spanning more than a decade, have developed a portfolio of technologies for low-temperature gas catalysis. Originally developed to support space-based CO_2 lasers, the technology has evolved into an array of performance capabilities and processing approaches, with potential applications ranging from indoor air filtration to automotive catalytic converters and industrial smokestack applications. The technology is now used commercially in systems that provide clean air to racecar drivers. Backed with extensive research on these technologies, NASA welcomes interest in the portfolio for other commercial and industrial applications.

Benefits

- Room temperature to several hundred degrees Celsius operation
- Oxidation removal of CO, formaldehyde, and other lightweight hydrocarbons
- Can be formulated for reduction of NOx
- Standard treatment available for silica and cordierite ceramic substrates
- Sprayable formulations available for catalyst treatment onto a variety of other substrates and substrate forms
- No external heating or energy input required
- Readily available materials and manufacturing methods
- Extensive history and experience at NASA for applications development and performance characterization

partnership opportunity

Langley Research Center

Applications

The technology offers wide-ranging market applications, including:

- Automotive exhaust catalytic converters
- Industrial process control
- Smokestack emission remediation
- Indoor air treatment
- Cabin air treatment
- Contained breathing systems

The Technology

The low-temperature oxidation catalyst technology employs a novel catalyst formulation, termed "platinized tin oxide" (Pt/SnOx). The catalysts can be used on silica gel and cordierite catalyst supports, and the latest developments provide sprayable formulations for use on a range of support types and shapes. Originally developed for removal of CO, the catalyst has also proven effective for removal of formaldehyde and other lightweight hydrocarbons.

NASA researchers have also extended the capability to include reduction of NOx for automotive catalytic converters via the engineered addition of other functional components. These catalyst formulations operate at elevated temperatures and have performed above the EPA exhaust standards for well beyond 25,000 miles.

For use as a gas sensor, the technology takes advantage of the exothermic nature of the catalytic reaction to detect formaldehyde, CO, or hydrocarbons, with the heat being produced proportional to the amount of analyte present.

The technology portfolio includes U.S. patents

7,318,915	4,991,181
6,753,293	4,912,082
6,132,694	4,855,274
5,948,965	4,839,330
5,585,083	4,829,035

For More Information

If your company is interested in licensing or joint development opportunities associated with this technology, or if you would like additional information on partnering with NASA, please contact:

The Technology Gateway

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Vol 1, Issue 1
NP-2008-04-77-LaRC

LAR-13741, LAR-13845, LAR-14155-1, LAR-15652-1, LAR-17154-1, LAR-16606, LAR-16308, LAR-16001, LAR-15351, LAR-15851