

TANAKA Develops MOC1-30 Series Methane Oxidation Catalyst with High Sulfur Resistance and More Than 80% Methane Conversion

Successful development of a new catalyst for gas engine application that maintains high catalytic performance even after 1,000 hours of continuous operation while balancing greenhouse gas emission with cost optimization, and enabling precious metal recycling.

Tokyo, Japan, August 4, 2026 - TANAKA PRECIOUS METAL TECHNOLOGIES Co., Ltd. (Head Office: Chuo-ku, Tokyo; CEO: Koichiro Tanaka), a company engaged in the industrial precious metals business of TANAKA, today announced the **development of the MOC1-30 series methane oxidation catalyst which has excellent resistance to sulfur (S) and maintains high purification performance over an extended period of time.**

The product is designed to remove **methane (CH₄) from the exhaust emissions of gas engines** powered by fuels such as natural gas and city gas. Since methane has a greenhouse effect approximately 25 times greater than carbon dioxide (CO₂), reducing these emissions have become a growing priority worldwide. This methane oxidation catalyst addresses the long-standing challenge of sulfur-induced catalyst deactivation and maintains more than 80% methane conversion even after 1,000 hours of continuous operation at an inlet gas temperature of 350°C.



MOC1-30 series

■ Background to Development

In recent years, the growing adoption of natural gas-powered generation systems and marine vessels, together with increasingly stringent emission regulations, has accelerated demand for technologies that further reduce methane emissions. Because methane has a significantly greater greenhouse effect than CO₂, reducing methane emissions has become an important global climate priority, driving the need for more advanced methane abatement technologies.

Meanwhile, gases derived from liquefied natural gas (LNG) and odorants*¹ often contain sulfur, and conventional methane oxidation catalysts faced the challenge of reduced catalytic activity due to the influence of sulfur. Furthermore, platinum (Pt) particles, which serve as the active sites for catalytic reactions, undergo sintering under high temperature operating conditions, resulting in reduced catalytic performance. In addition, desulfurization systems are commonly used to remove sulfur compounds. However, complete sulfur removal is difficult to achieve, and even trace amounts of sulfur can contribute to catalyst degradation.

Therefore, there was a need to develop a methane oxidation catalyst that limits the reduction in catalytic performance and can maintain stable performance even in the presence of sulfur and under high-temperature environments.

■ Features of Technology Developed in this Product

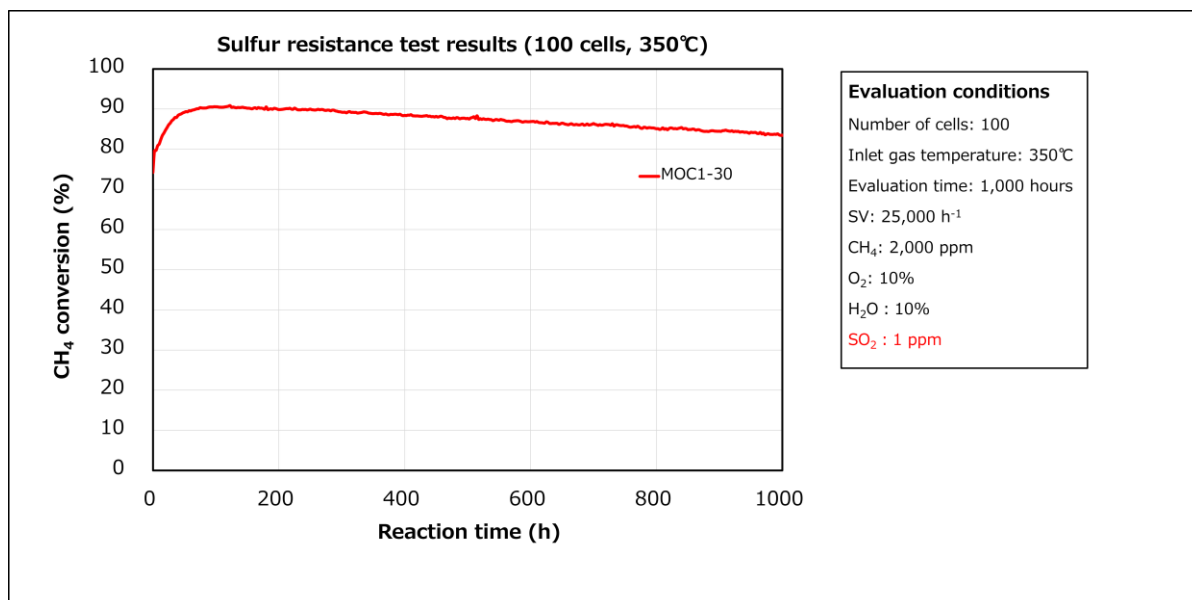
Using a proprietary technology, TANAKA's MOC1-30 methane oxidation catalyst converts sulfur adsorbed on the catalyst surface into sulfur trioxide (SO₃) while maintaining the bonding between Pt particles and the catalyst support. This suppresses the inhibition of reactions caused by sulfur and the agglomeration of Pt particles, preventing a reduction in catalytic performance, thereby maintaining stable catalytic activity for an extended period.

In addition, TANAKA has established an integrated system covering the entire value chain, from procurement and material development to manufacturing, sales, and recycling. The MOC1-30 series is also compatible with precious metal recycling after use. Leveraging its unique capability across the entire catalyst value chain, from precious metal material development to catalyst design and manufacturing, TANAKA aims to introduce this solution to the global market to help reduce environmental impact while supporting resource circularity.

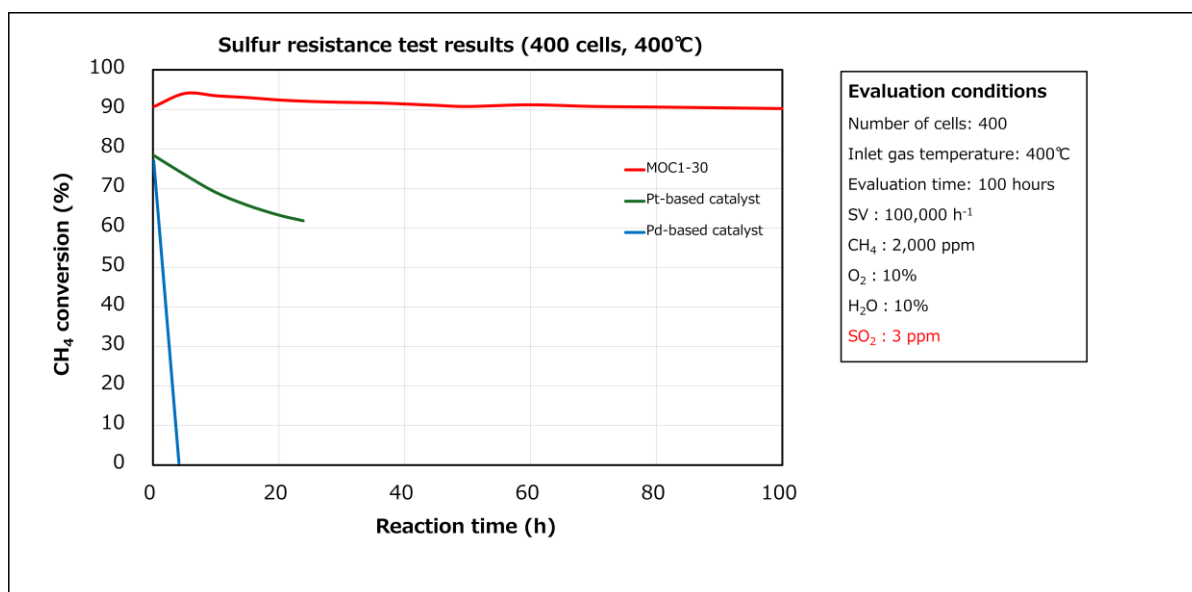
■ Performance evaluation results

In the catalytic performance evaluation of this product, it was confirmed that under model gas conditions (SV*² 25,000 h⁻¹, 100 cells, and inlet gas temperature 350°C) containing 2,000 ppm of methane, 10% oxygen (O₂), and 1 ppm of sulfur dioxide (SO₂) in nitrogen (N₂) gas, a methane conversion*³ of at least 80% was maintained even after 1,000 hours of continuous reaction. In addition, the catalyst was confirmed to maintain a high methane conversion of approximately 90% after 100 hours of continuous reaction under model gas conditions (SV 100,000 h⁻¹, 400 cells, and inlet gas temperature 400°C) containing 3 ppm of sulfur dioxide. Furthermore, MOC1-30 showed excellent durability when compared to conventional Pt-based and palladium (Pd)-based catalysts, confirming results significantly exceeding those of conventional catalysts.

Based on these results, MOC1-30 has excellent sulfur resistance and methane purification performance. It is expected to be a catalyst that contributes toward reducing emitted methane in applications such as gas engines for ships and stationary gas engines.



MOC1-30 series sulfur resistance test results (1)



MOC1-30 series sulfur resistance test results (2)

■ Implementation effects and prospects

In addition to helping meet methane emission regulations, MOC1-30 can reduce operating costs by extending catalyst lifespan and reducing the need for frequent replacements. It can also reduce reliance on desulfurization systems, contributing toward improving overall system efficiency. This product is expected to achieve a balance between environmental performance and economic feasibility, and at

the same time, the used catalyst can be recovered and recycled, thereby contributing to sustainable resource circulation.

Currently, the scope of gas engine application is expanding, including ship propulsion, emergency power generation, and distributed power for data centers. Correspondingly, investment demand for reducing methane emissions is also expected to increase. In the growing market for gas engines, MOC1-30 offers a compelling solution that contributes to the realization of a carbon-neutral society by both reducing greenhouse gas emissions and optimizing costs.

For decades, TANAKA has developed a wide range of precious metal catalysts for applications including emission control and energy-related technologies. In recent years, the company has also focused on technologies that support carbon neutrality, and the MOC1-30 series was developed as part of these efforts. Leveraging its integrated value chain, from bullion procurement and technology development to manufacturing, sales, and precious metal recycling, TANAKA will continue to contribute to industrial decarbonization and the realization of a sustainable society.

***1 Odorant:** A component added to detect gas leaks.

***2 SV:** Refers to space velocity, which is an indicator representing the volume of gas flowing per unit of time, expressed as a multiple of the catalyst layer volume.

***3 Methane conversion:** An indicator showing the percentage of methane changed (converted) into other substances through a catalytic chemical reaction. The closer this value is to 100%, the more methane that would otherwise be released into the atmosphere unburned is being removed.

■ About TANAKA

Since its foundation in 1885, TANAKA has built a portfolio of products to support a diversified range of business uses focused on precious metals. TANAKA is a leader in Japan regarding the volume of precious metals it handles. Over many years, TANAKA has manufactured and sold precious metal products for industry and provided precious metals in such forms as jewelry and assets. As precious metals specialists, all Group companies in Japan and worldwide collaborate on manufacturing, sales, and technology development to offer a full range of products and services. With 5,778 employees, the group's consolidated net sales for the fiscal year ended December 2025 were 1,097,813 million yen.

■ TANAKA Industrial Precious Metal Materials Portal

<https://tanaka-preciousmetals.com>

■ Product inquiries

TANAKA PRECIOUS METAL TECHNOLOGIES Co., Ltd.

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