Ultra-efficient removal of carbon monoxide using gold nanoparticles on a molecular support

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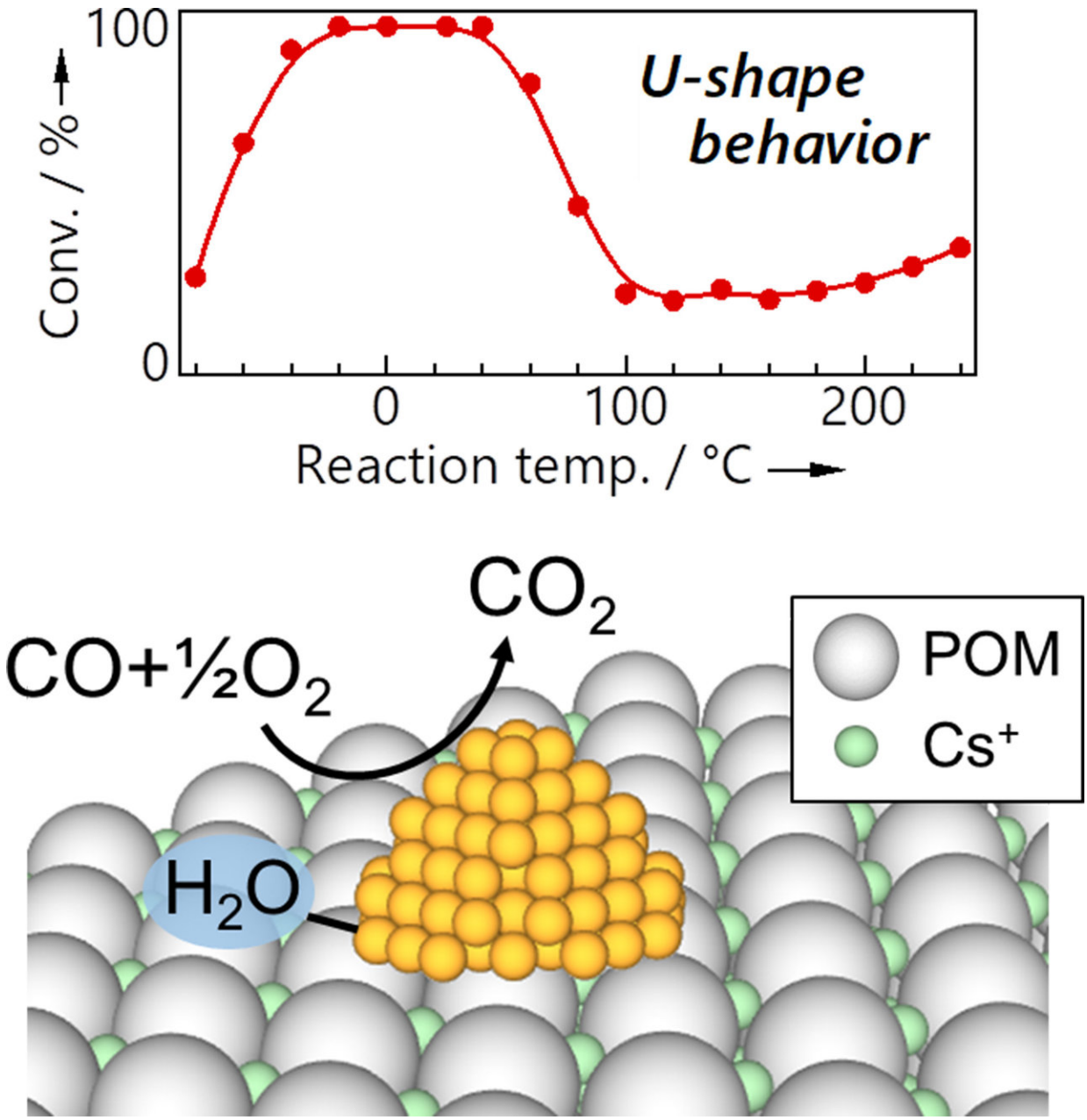

New catalyst consisting of gold nanoparticles supported on a Keggin-type polyoxometalate (POM) with a cesium salt. The structure showed high activity and stability for CO oxidation; trace amounts of water were found to be essential to the function of the material. Catalytic activity showed a unique, U-shaped dependence on temperature. Credit: Toru Murayama

Researchers from Tokyo Metropolitan University have developed a way to mount gold nanoparticles on a molecular support known as a polyoxometalate (POM). They successfully applied this to realize nearly 100 percent conversion of carbon monoxide (CO) over a wide temperature range, demonstrating stable performance over long periods of time. They showed how traces of water uniquely contribute to the catalyst's function, promising insight into catalysis and potential application to exhaust gas and room air purification.

Gas purification is an extremely important industrial process, whether in factories, catalytic converters for vehicle exhausts, or the domestic air purifier. Recently, research has focused on using nanometer-sized gold particles, prized for their ability to speed up ("catalyze") chemical reactions, even at very small (