

Researchers develop a way to capture furnace emissions

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Oak Ridge National Laboratory researchers built a prototype natural gas furnace that uses acidic gas reduction technology to remove or trap potentially



environmentally harmful emissions. Credit: ORNL, U.S. Dept. of Energy

Oak Ridge National Laboratory researchers have developed a novel solution to reduce the environmental impact of natural gas-condensing furnaces commonly used in U.S. homes.

The team built a prototype furnace that incorporates monolithic acidic gas reduction, or AGR, as the catalyst to minimize acidic gases and condensate acidity, and oxidize <u>carbon monoxide</u>, hydrocarbons and methane.

In a demonstration, researchers conducted a 400-hour reliability and durability test and proved that AGR, made of titanium dioxide, copper oxide and minor platinum, removed more than 99.9% of the acidic gas products produced during combustion. It trapped and removed sulfur oxides and reduced additional emissions.

"AGR functions like a catalytic converter in a car, passing the exhaust over metals to reduce acidic gases and other pollutant <u>emissions</u> that contribute to global climate change," ORNL's Zhiming Gao said. "This technology could be applied to commercial rooftop units, thermally driven heat pumps, gas-fired water heaters and boilers."

More information: Zhiming Gao et al, Ultra-clean condensing gas furnace enabled with acidic gas reduction, *Energy* (2021). <u>DOI:</u> <u>10.1016/j.energy.2021.123068</u>

Provided by Oak Ridge National Laboratory



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