

Researchers develop a way to capture furnace emissions

March 1 2022



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 [carbon monoxide](#), 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 [emissions](#) 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). [DOI: 10.1016/j.energy.2021.123068](https://doi.org/10.1016/j.energy.2021.123068)

Provided by Oak Ridge National Laboratory

Citation: Researchers develop a way to capture furnace emissions (2022, March 1) retrieved 16 April 2024 from <https://techxplore.com/news/2022-03-capture-furnace-emissions.html>

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