

Scientists propose new method for large-scale production of thermally stable single-atom catalysts

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A research group led by Prof. Qiao Botao from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences has

proposed a new method for large-scale production of thermally stable single-atom catalysts (SACs) with high metal loading. Their findings were published in *Nature Communications* on Mar. 9.

SACs can maximize precious metal utilization and generate well-defined and uniform active sites. However, large-scale production of thermally stable SACs, especially in a simple way, remains a challenge.

The researchers mixed RuO₂ powder with high surface Fe-containing spinel support. After high-temperature calcination (900 degrees C), they found that the submicron RuO₂ powder directly dispersed into Ru single [atoms](#).

Detailed studies revealed that different from the traditional gas atom trapping approach, the dispersion of RuO₂ was promoted, and the atom was trapped and stabilized by a strong covalent metal-support interaction with FeOx in the spinel support.

In addition, the obtained Ru SAC showed excellent thermal stability and improved activity for N₂O decomposition. This environmentally friendly and low-cost preparation method could achieve kilogram-level production of commercial Fe₂O₃ supported Ru SAC, and paves the way toward large-scale production of thermally stable SACs for industrial applications.

More information: Kaipeng Liu et al, Strong metal-support interaction promoted scalable production of thermally stable single-atom catalysts, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-14984-9](https://doi.org/10.1038/s41467-020-14984-9)

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