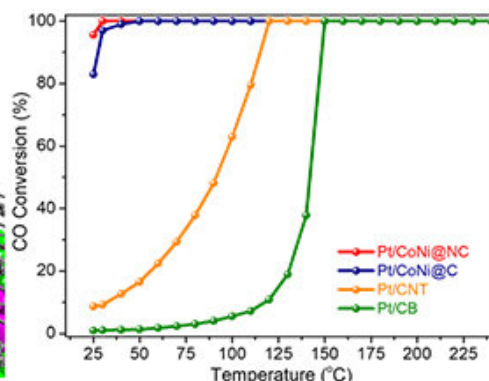
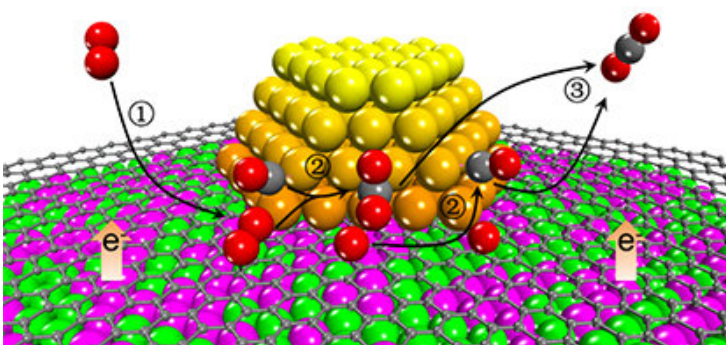


# 'Chainmail catalysis' improves efficiency of CO oxidation at room temperature

November 2 2021, by Zhang Nannan



Graphene-isolated Pt from CoNi nanoparticles (Pt|CoNi) for efficiently catalytic CO oxidation. Credit: HU Jingting

CO oxidation at room temperature is significant for gas purification. Pt promoted by 3d transition metals (TMs) is a promising candidate for this reaction. However, TMs are prone to be deeply oxidized in an oxygen-rich atmosphere, leading to low activity.

Recently, a research group led by Prof. Deng Dehui from the Dalian Institute of Chemical Physics (DICP) of the Chinese Academy of Sciences (CAS) designed a chainmail catalysis of graphene-isolated Pt from CoNi nanoparticles (Pt|CoNi) for CO oxidation at room [temperature](#).

The study was published in *Nature Communications* on Oct. 04.

CoNi alloy was protected by ultrathin graphene shell from [oxidation](#) and therefore modulated the electronic property of Pt-graphene interface via electron penetration effect. It achieved near 100% CO conversion at [room temperature](#), while there were limited conversions over Pt/C and Pt/CoNiO<sub>x</sub> catalysts.

By experiments and theoretical calculations, the researchers indicated that CO could saturate Pt sites, but O<sub>2</sub> could adsorb at the Pt-graphene interface without competing with CO, which facilitated the O<sub>2</sub> activation and the subsequent surface reaction.

"The graphene-isolated system in this work is distinct from the classical metal-metal oxide [interface](#) for catalysis, and it provides a new thought for the design of heterogeneous catalysts," said Prof. Deng.

**More information:** Yong Wang et al, Electron penetration triggering interface activity of Pt-graphene for CO oxidation at room temperature, *Nature Communications* (2021). [DOI: 10.1038/s41467-021-26089-y](https://doi.org/10.1038/s41467-021-26089-y)

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