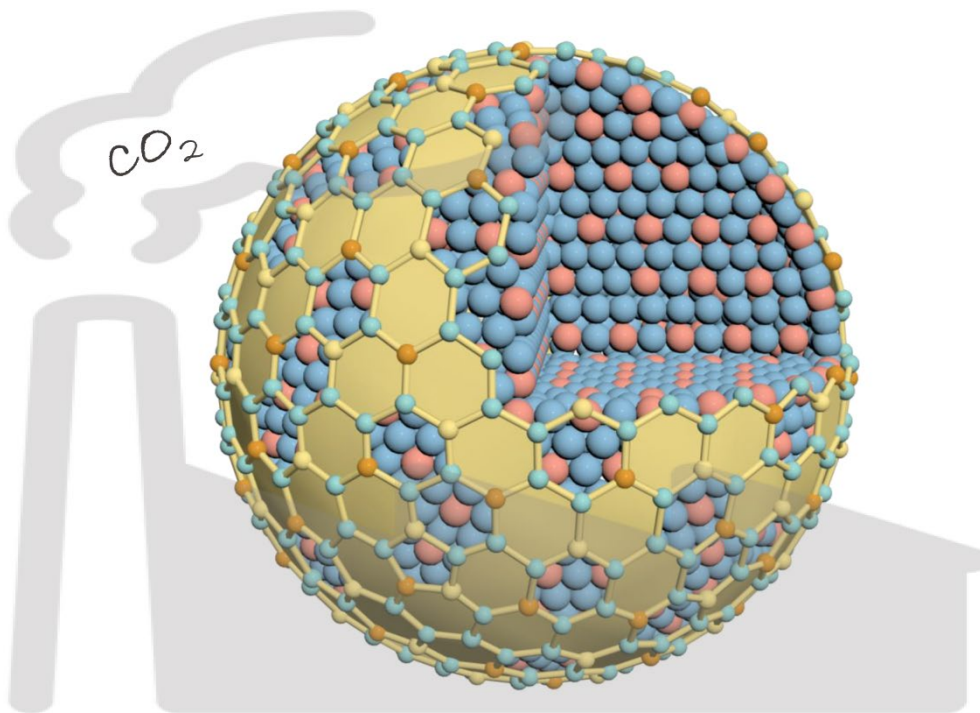


Encapsulated alloy catalysts and their methods of preparation



Encapsulated alloy catalysts for CO₂ electroreduction

Description

High-temperature CO₂ electroreduction in a solid oxide electrolysis cell (SOEC) offers a promising solution to renewable energy storage and carbon recycling. However, current CO₂ SOEC catalysts suffer from a low energy efficiency and severe degradation at industrial relevant current densities. Here we describe an invention of novel catalysts for CO₂ electroreduction in SOEC. These catalysts are composite catalysts consisting of non-precious alloys encapsulated by oxides. The unique structure and composition lead to high efficiency and stability.

Advantages

Normally non-precious metals and alloys have lower activity and stability than

precious metal catalysts. Also current CO₂ SOEC catalysts have low stability due to particle agglomeration and coke formation. Our new design of catalysts leads to the surprising result that non-precious catalysts that can be more active than precious metal catalysts, and have high stability without particle agglomeration and coke formation.

Applications

- High-temperature CO₂ electroreduction
- Solid oxide electrolysis cell
- Providing CO feedstocks for chemicals production

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