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A Promising N-doped Carbon-Metal Oxide Hybrid Electrocatalyst Derived from Crustacean's Shells: Oxygen Reduction and Oxygen Evolution

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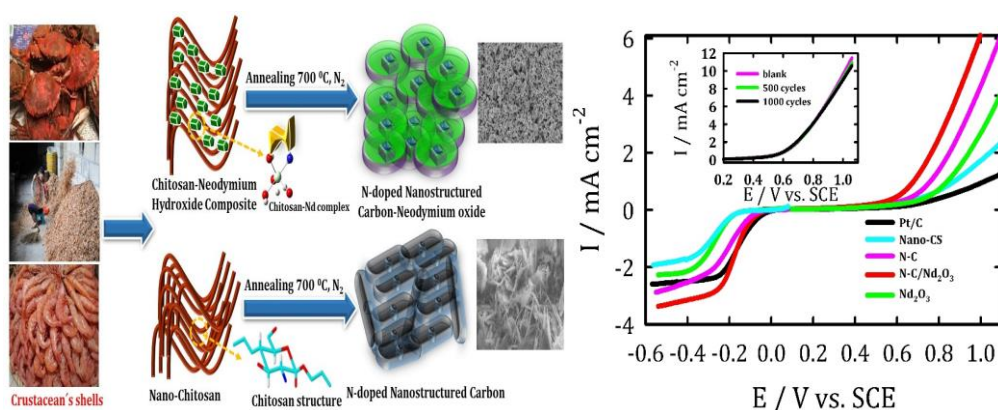
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Graphical abstract



- The chitosan which obtained from Crustacean's Shells is converted into N-doped Carbon (N-C)
- The obtained N-C exhibits outstanding activity and durability for OER and ORR compared to Pt/C
- N-C catalyst has a higher poison-tolerant against various type of impurities compared to Pt/C
- Further modification of N-C with Nd₂O₃ nanostructured resulted in a significant improvement
- N-C/Nd₂O₃ catalyst delivered outstanding power density ($\sim 287 \text{ mW cm}^{-2}$)

Abstract

The development of efficient and durable Pt-free catalysts for the oxygen reduction reaction (ORR) is extremely important to realize the world-wide commercialization of clean energy technologies obstructed by the high cost and scarcity of the Pt-based catalysts. As a potential alternative to such catalysts, this investigation addresses the facile synthesis of an efficient, durable and highly poison-tolerant metal-free N-doped carbon-Nd₂O₃ hybrid bifunctional electro-catalyst for ORR and water splitting compared to commercial

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