GREEN AND COST-EFFICIENT SYNTHESIS OF BIFUNCTIONAL M-N-C-TYPE ELECTROCATALYST

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To effectively overcome the ORR/OER overpotentials, the Pt-group noble-metal electrocatalysts are widely applied in electrocatalysis despite their high cost.

Expensiveness and low abundance together with poor stability of noble-metal-based catalysts make it necessary to find a replacement for a cheaper production of these advanced energy systems. Extensive research of this topic by scientific society resulted in developing various non-noble-metal-based catalysts. Among the recently developed materials, M-N-C catalysts demonstrate great catalytic activity and extraordinary stability, low cost, and a wide variety of sources, making them excellent alternative for Pt-based catalysts.

Today, the most commonly used method for producing M-N-C type catalysts is the carbonization of the precursor material or wet-impregnation of the precursor on carbon support with subsequent carbonization. Additionally, available production methods often do not meet the current environmental requirements, and the majority of methods are energy-demanding.

Here we present a new outlook on a large-scale synthesis of M-N-C type catalysts with bifunctional electroactivity towards oxygen reduction and evolution reactions by employing facile green production methods.

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