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Recent Advancements in M-N-C Catalysts for Electrochemical Energy Conversion Devices

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Message from the Guest Editors

To reduce and eventually eliminate our dependence on fossil fuels, efficient and affordable electrochemical energy conversion technologies should be largely implemented. This idea relies heavily on the development of fuel cells, electrolyzers, and batteries, of which the performance is limited by the electrode reactions due to their multiple charge- and proton-transfer steps, which occur typically at three-phase interfaces.

The topics include M-N-C materials with single-atom sites for all types of energy conversion devices, such as fuel cells, water electrolyzers, CO_2 reduction electrolyzers, N_2 reduction electrolyzers, batteries, etc.

Experimental and theoretical insights on M-N-C electrocatalyst synthesis, characterization, structure-performance relationship, reaction intermediate pathways, and degradation mechanisms are particularly welcome. Furthermore, electrode structure studies to understand the catalyst aggregate size, catalyst pore size, ionomer distribution, ion transfer and mass transport in bulk electrode, etc., and their impacts on device performance are also kindly invited.