

Strategy for enhancing oxygen reduction activity of carbon-based materials in acid media

최창혁, 정민욱, 이승용, 우성일*

KAIST

(siwoo@kaist.ac.kr*)

As a new non-noble metal catalyst for oxygen reduction reactions (ORRs) in acidic media, N-doped carbon has attracted much attention due to its low price and high stability in acidic media compared with commercial noble metal catalysts (e.g., Pt or Pd). However, alternatives of noble metal catalysts for N-doped carbon in commercial markets have limitations due to the relatively low ORR activity in acidic media. Therefore, various state-of-the-art techniques have been developed recently in order to modify the carbon-based catalysts, decorating them with desired features for the ORRs. Herein, a new approach to advance the nature of carbon-based materials as ORR catalysts is presented. In contrast with previous methods, including the secondary pyrolysis step or modification of carbon pores, a different strategy to modify the carbon-based catalyst is introduced. The experimental results demonstrated that the additional doping of heteroatoms modifies the carbon characteristics and improves the ORR activity of the NDC-based catalysts.