

SUSTAINABLE CO₂-DERIVED NANOSCALE CARBON SUPPORT TO A PLATINUM CATALYST FOR OXYGEN REDUCTION REACTION

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While fuel cells have the potential to be among the key players in clean energy production, they are challenged by the sluggish electrochemical reactions that require an expensive and scarce Pt catalyst. Commercial Pt-based catalysts used for facilitating the hydrogen oxidation reaction (HOR) and oxygen reduction reaction (ORR) in fuel cells are commonly supported by petroleum-sourced carbon materials such as Vulcan XC-72. Thus, the replacement of such support materials with sustainable alternatives while enhancing the catalyst activity is highly desirable.

For the first time, a Pt catalyst supported with a sustainably manufactured nanoscale CO₂-derived carbon (Pt/CO₂-C) was synthesised in this work. Physical and electrochemical characterization of the catalyst revealed the superior activity of Pt/CO₂-C towards ORR in comparison to the commercial Pt/C with higher onset potential, mass and specific activity values. Via further improvement, the prepared catalyst material is deemed to be a promising candidate for cheaper and more sustainable fuel cells.



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