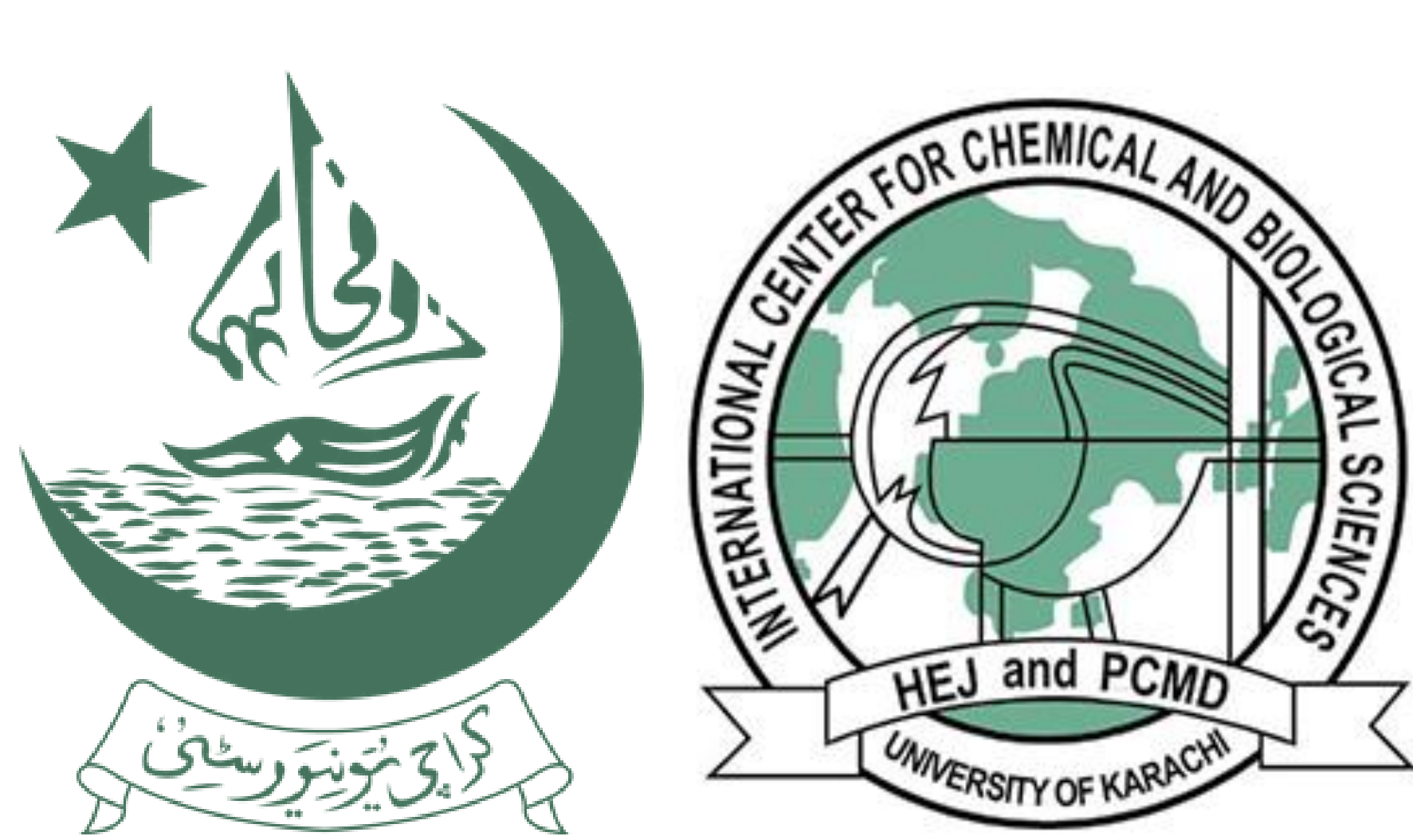




Revolutionizing Green Hydrogen Energy with Graphene Oxide-Driven Electrocatalysts

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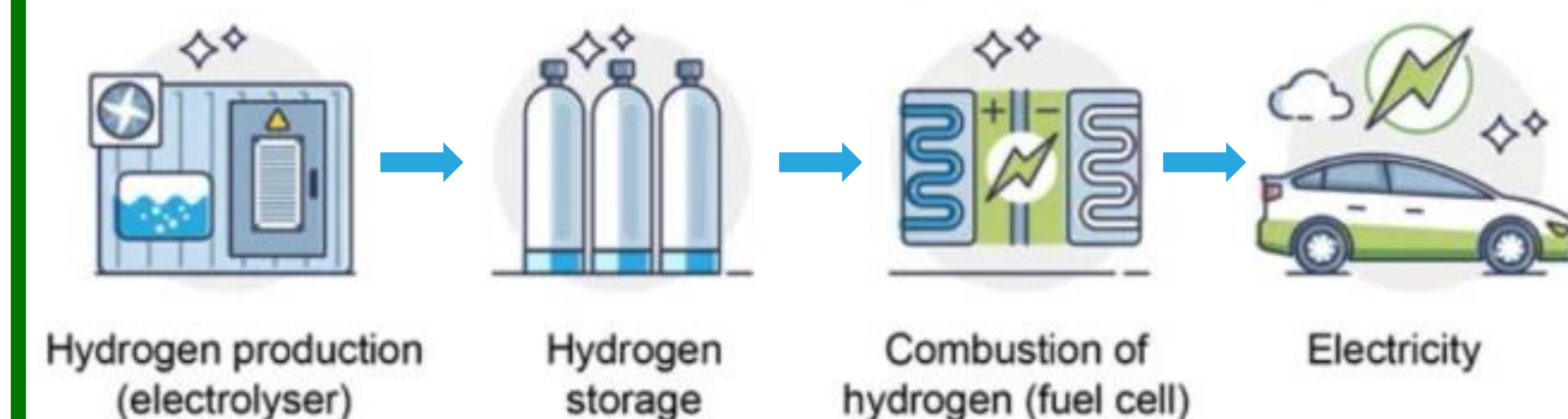
^b Net-Zero Industry Innovation Centre, School of Computing, Engineering and Digital Technologies, Teesside University, Middlesbrough, United Kingdom.

Commonwealth
Chemistry
Federation of Chemical Sciences Societies

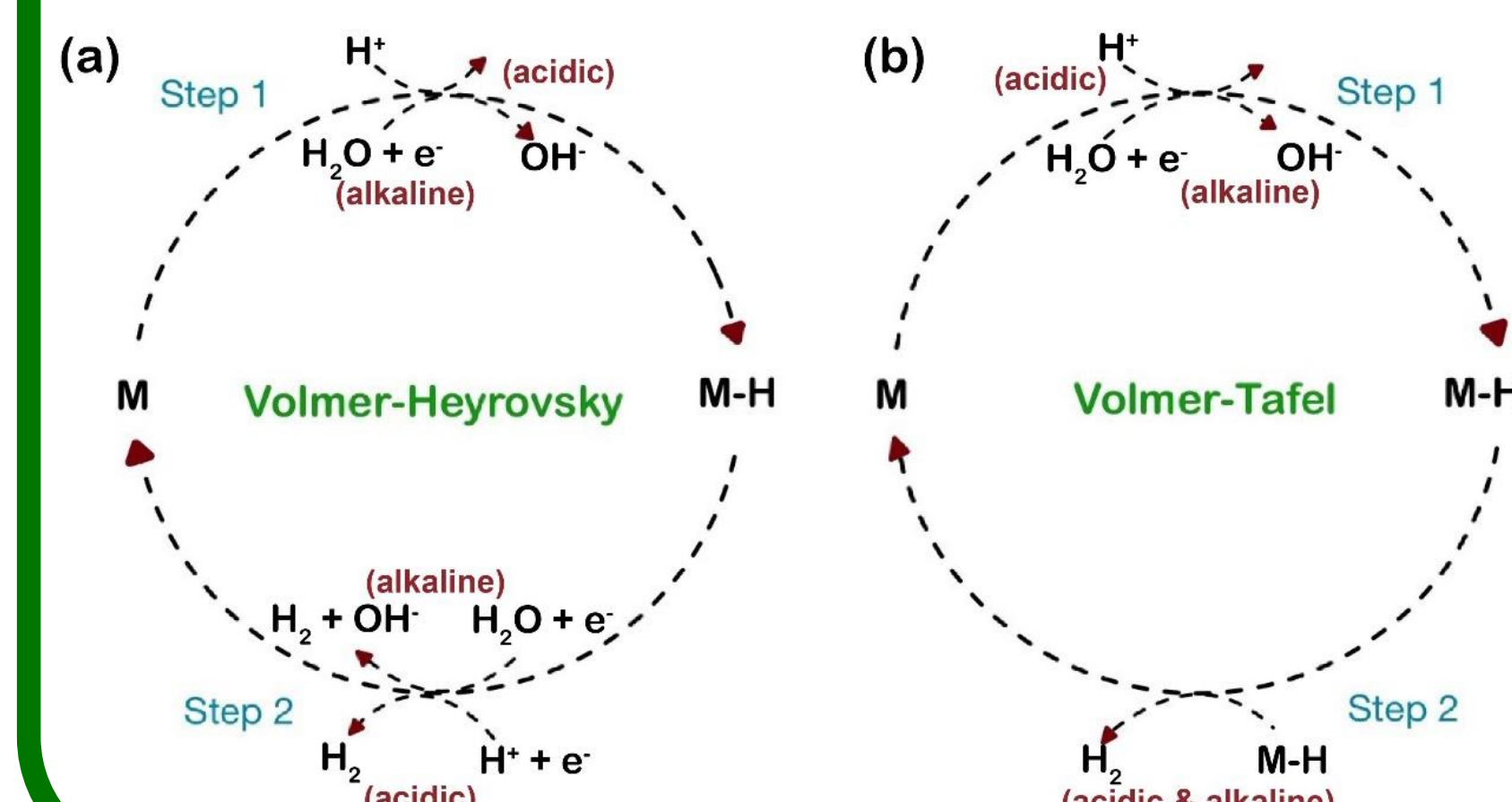
ROYAL SOCIETY
OF CHEMISTRY

Introduction

Hydrogen as clean energy



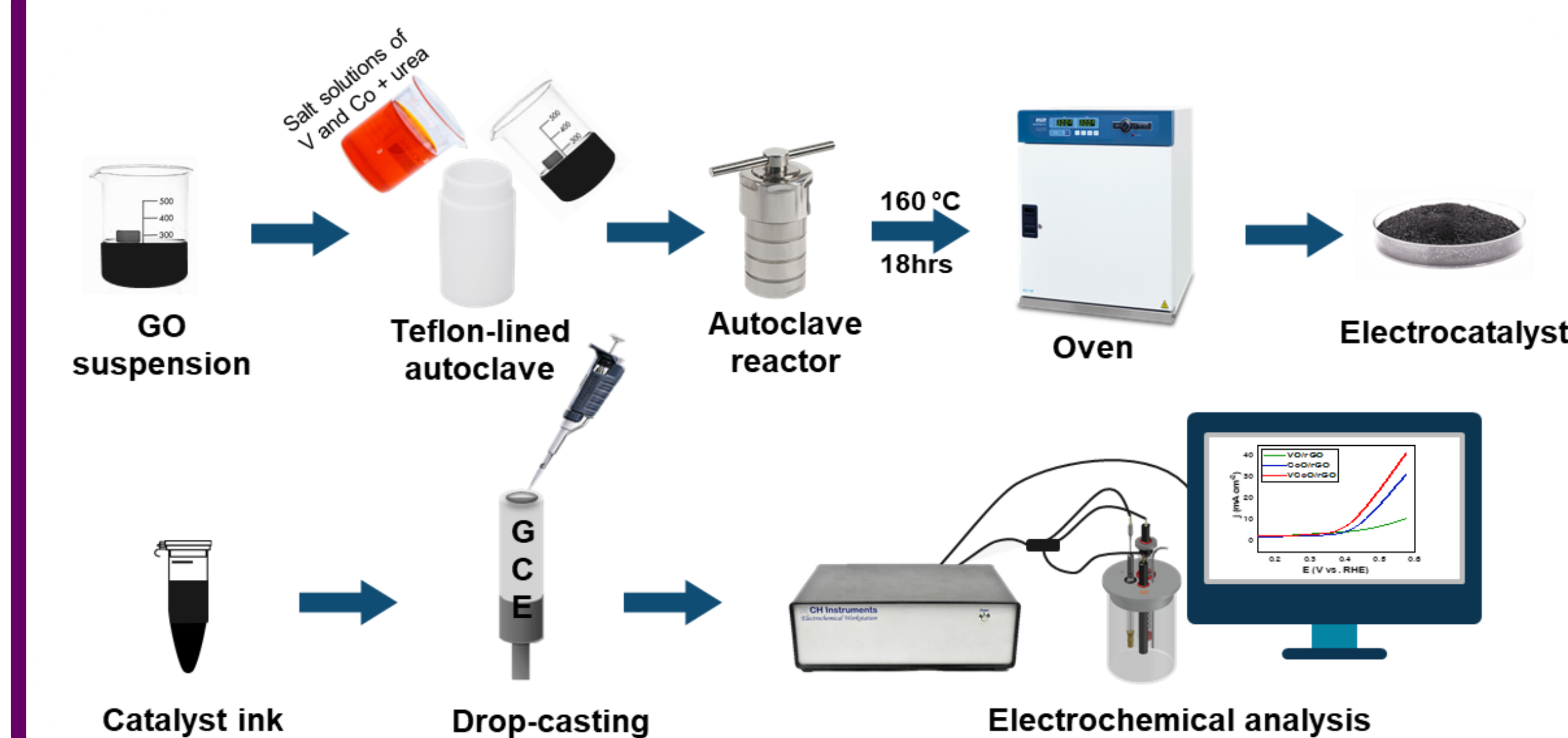
HER Mechanism



Advantages

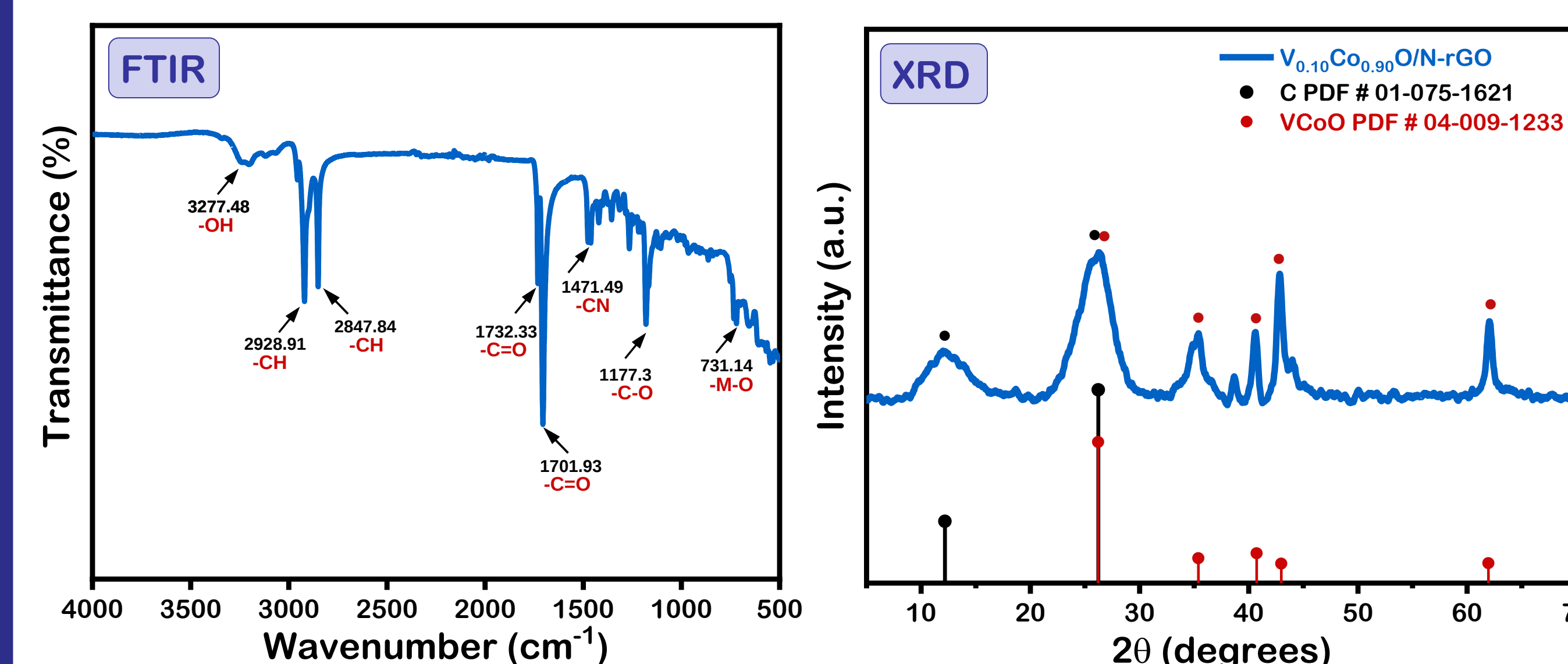
- 1 Clean Fuel
- 2 Replaces fossil fuels
- 3 Zero CO₂ emissions
- 4 Excellent energy carrier (120MJ/kg)
- 5 Improves air quality

Methodology

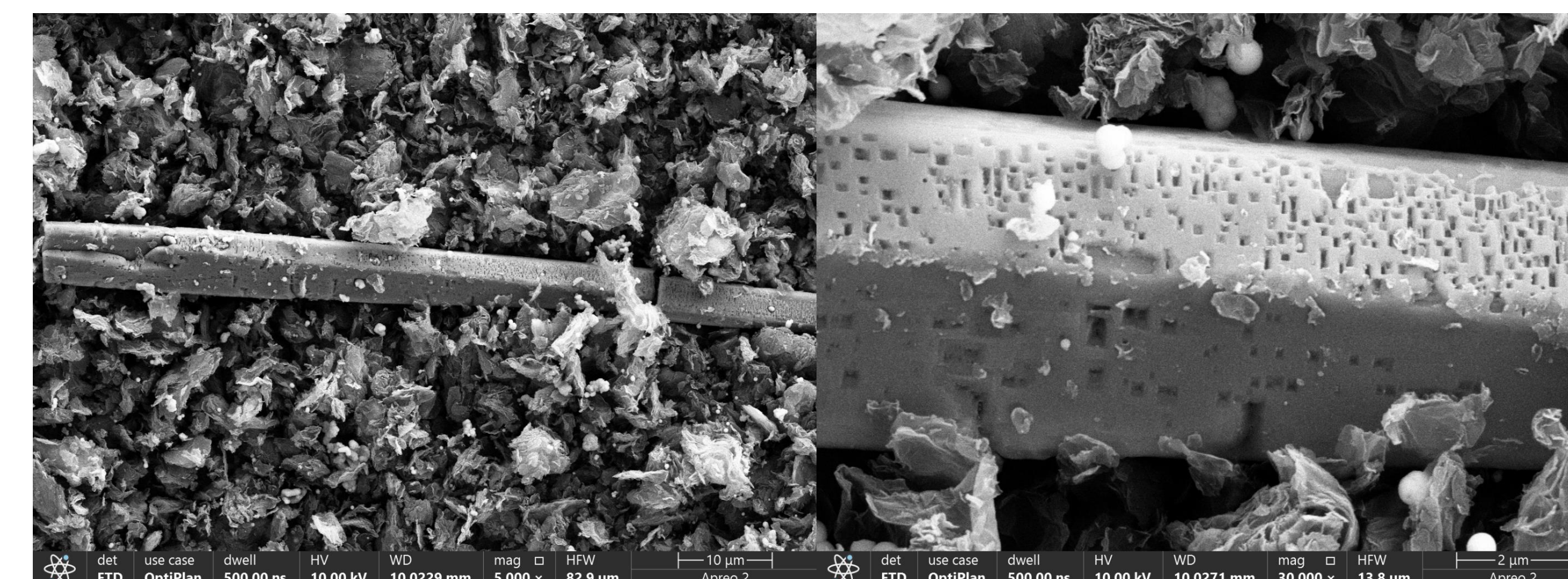


Results and Discussion

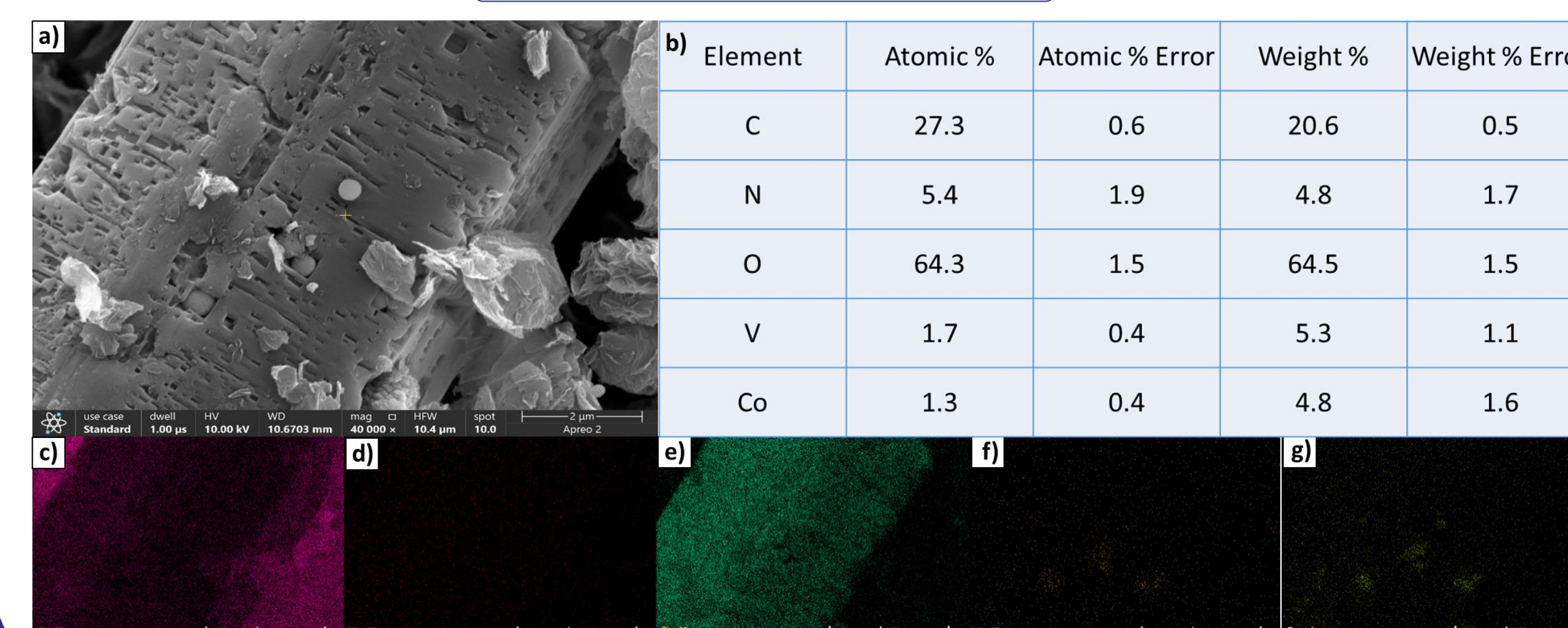
Characterizations



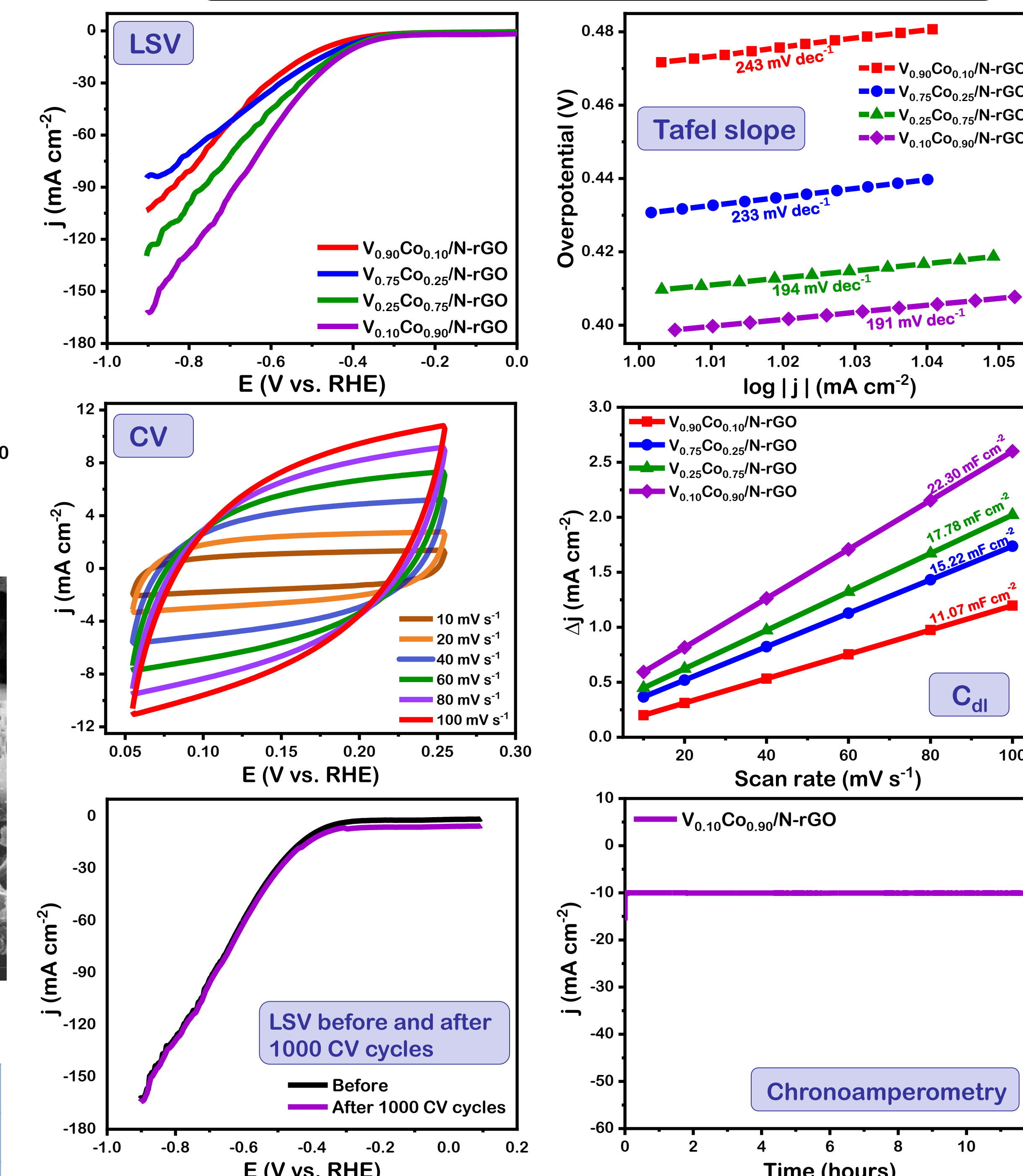
SEM Images



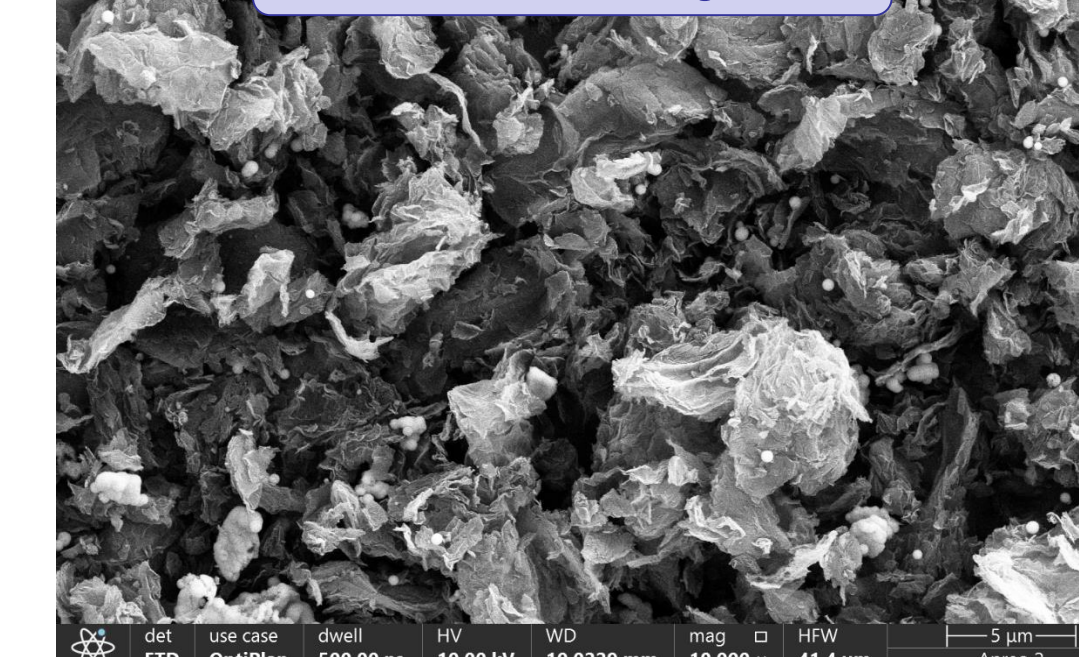
EDX Elemental Mapping



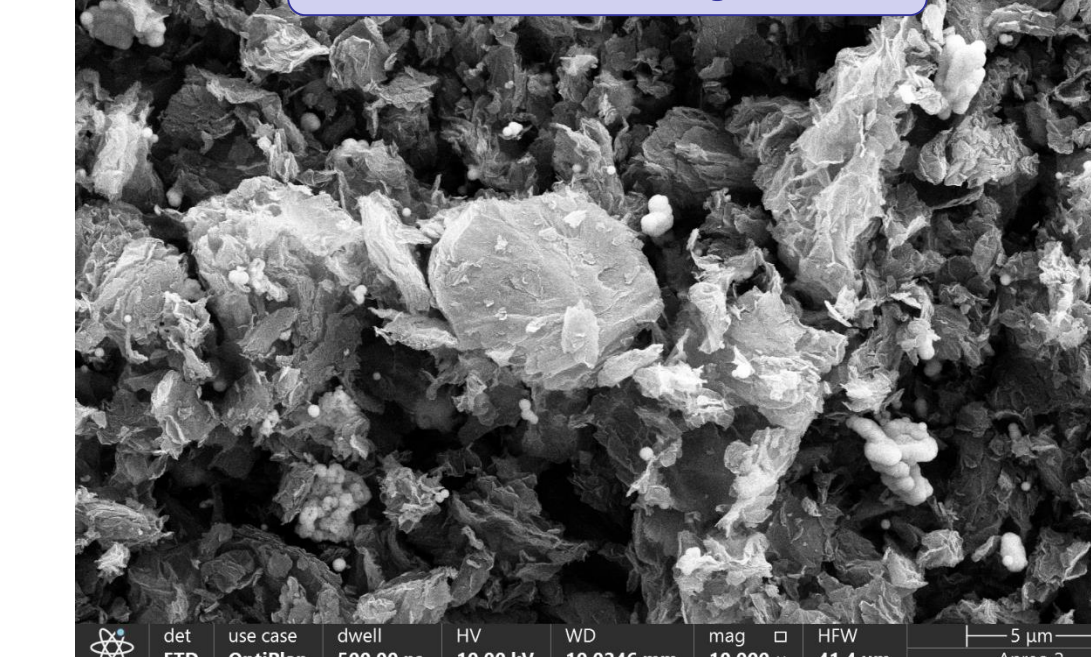
Electrochemical Studies



Before stability test



After stability test



Aims and Objectives

- To synthesize a cost-effective and novel carbonaceous electrocatalysts with improved efficiency for hydrogen production.
- To assess the durability of the synthesized electrocatalysts during extended electrochemical reaction.
- To improve the catalytic performance of the electrocatalysts by incorporating and doping them with metals and non-metals.

Sustainable Development Goals



Important Outcomes

- This work is a low-cost, scalable, and eco-friendly alternative to noble metal catalysts.
- Reduced graphene oxide provides more active sites which leads to fast electron transfer process.
- This work promotes efficient and sustainable green hydrogen production.

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- Yusuf, B. A., Xie, M., Ullah, N., Olugbo, C. J., Yaseen, W., Xie, J., & Xu, Y. (2021). Facile synthesis of N, S co-doped MoO₂@C nanorods as an outstanding electrocatalyst for hydrogen evolution reaction. Applied Surface Science, 537, 147971. doi:https://doi.org/10.1016/j.apsusc.2020.147971