

Evaluation of Metal Foam Supported Nanocomposites as Electrocatalysts for Water Splitting

Rafia Imtiaz,* Zeeshan Abid, Samman Zafar, Muhammad Imran Abdullah, Muhammad Altaf, Raja Shahid Ashraf
Institute of Chemical Sciences, Department of Chemistry, Government College University Lahore, Punjab, Pakistan

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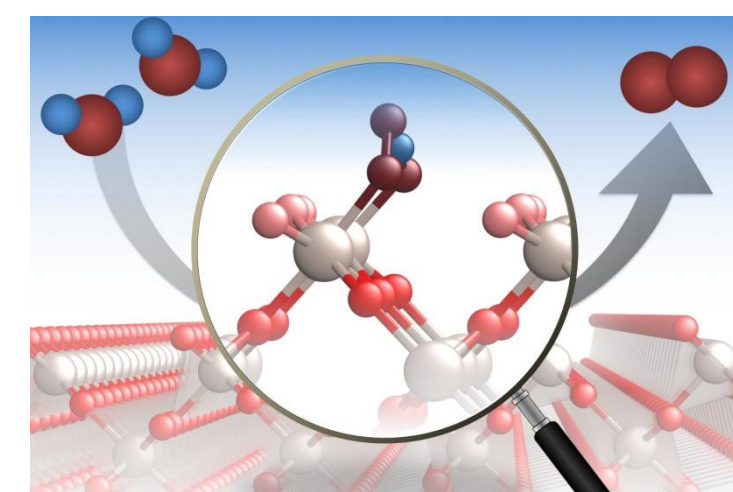


Abstract

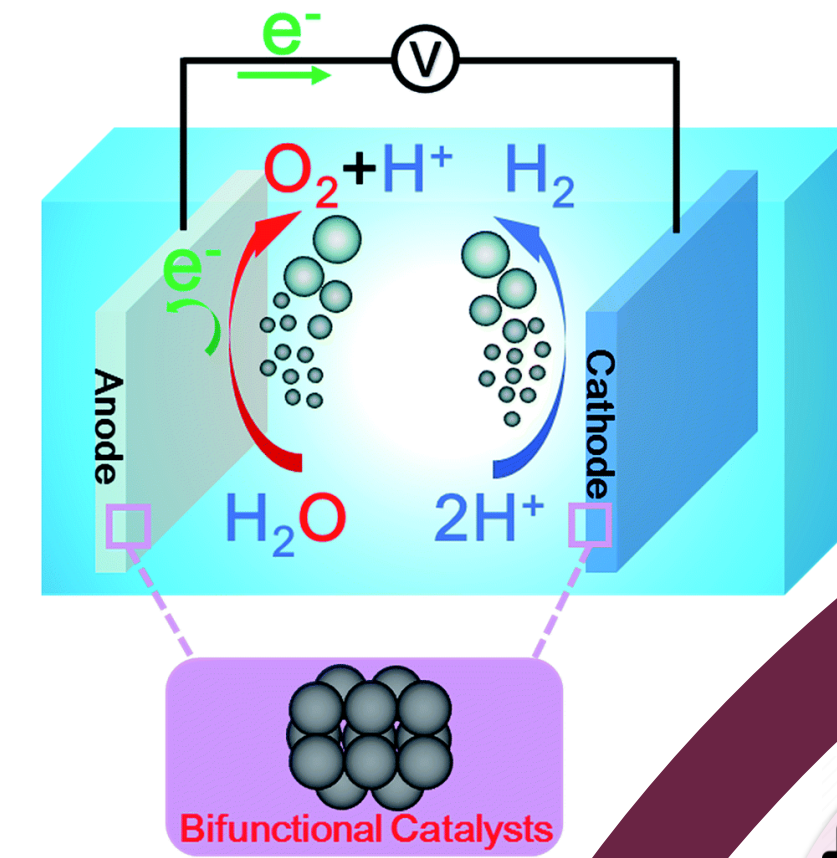
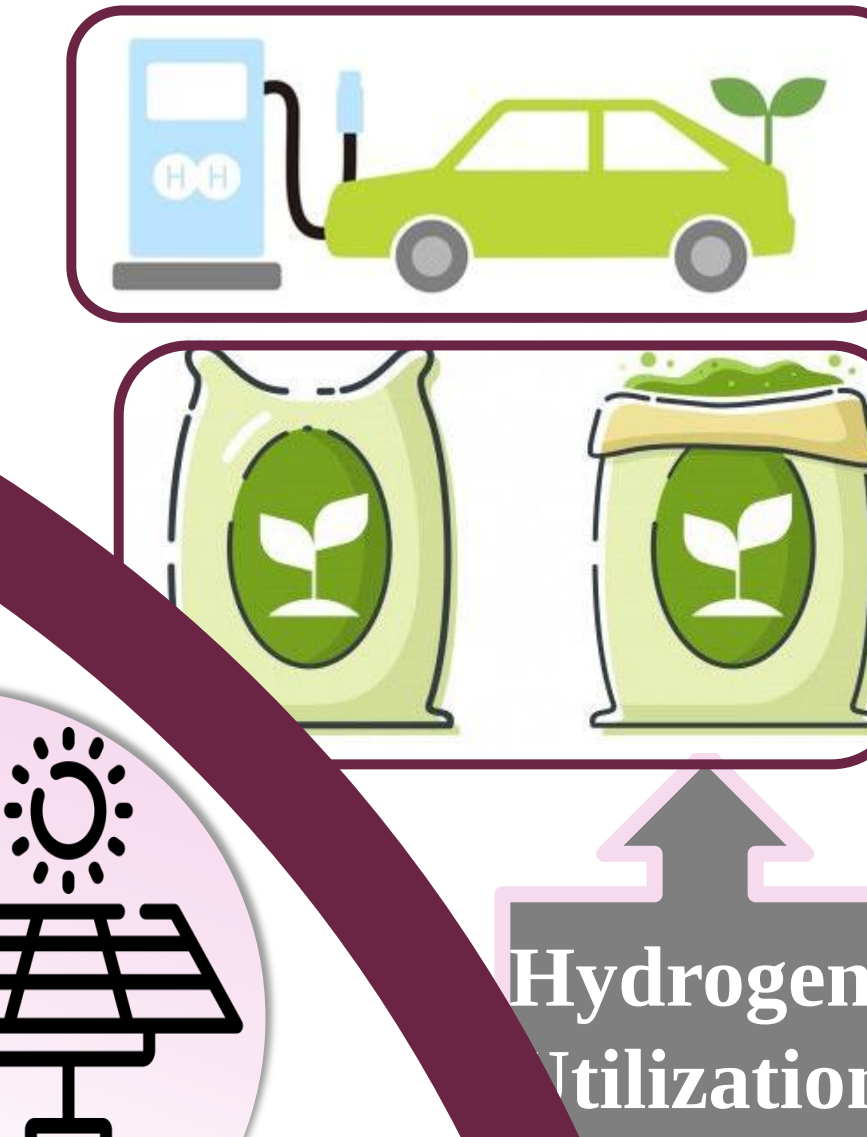
Electrocatalytic water splitting generate clean and renewable fuels includes hydrogen. It has been observed that a variety of ultra-durable, non-noble metal nanoparticles make effective electrocatalysts. The optimal electrocatalysts $\text{Ni}_{0.2}\text{Se}_{0.3}\text{B}/\text{Ni}$ -foam and $\text{Ni}_{0.2}\text{Se}_{0.3}\text{B}/\text{Ni}$ -foam only requires a small Overpotentials of 210 mV and 107 mV to drive $100 \text{ mA}\cdot\text{cm}^{-2}$ and 10 mA cm^{-2} of current densities for OER and HER, respectively.

Introduction

Electrochemical water splitting involve the use of electrical energy. Aim is to prepare electrocatalysts for Breaking of chemical bond in water to produce hydrogen and oxygen gas.



Background



Hydrogen Utilization

SEM and EDS Analysis

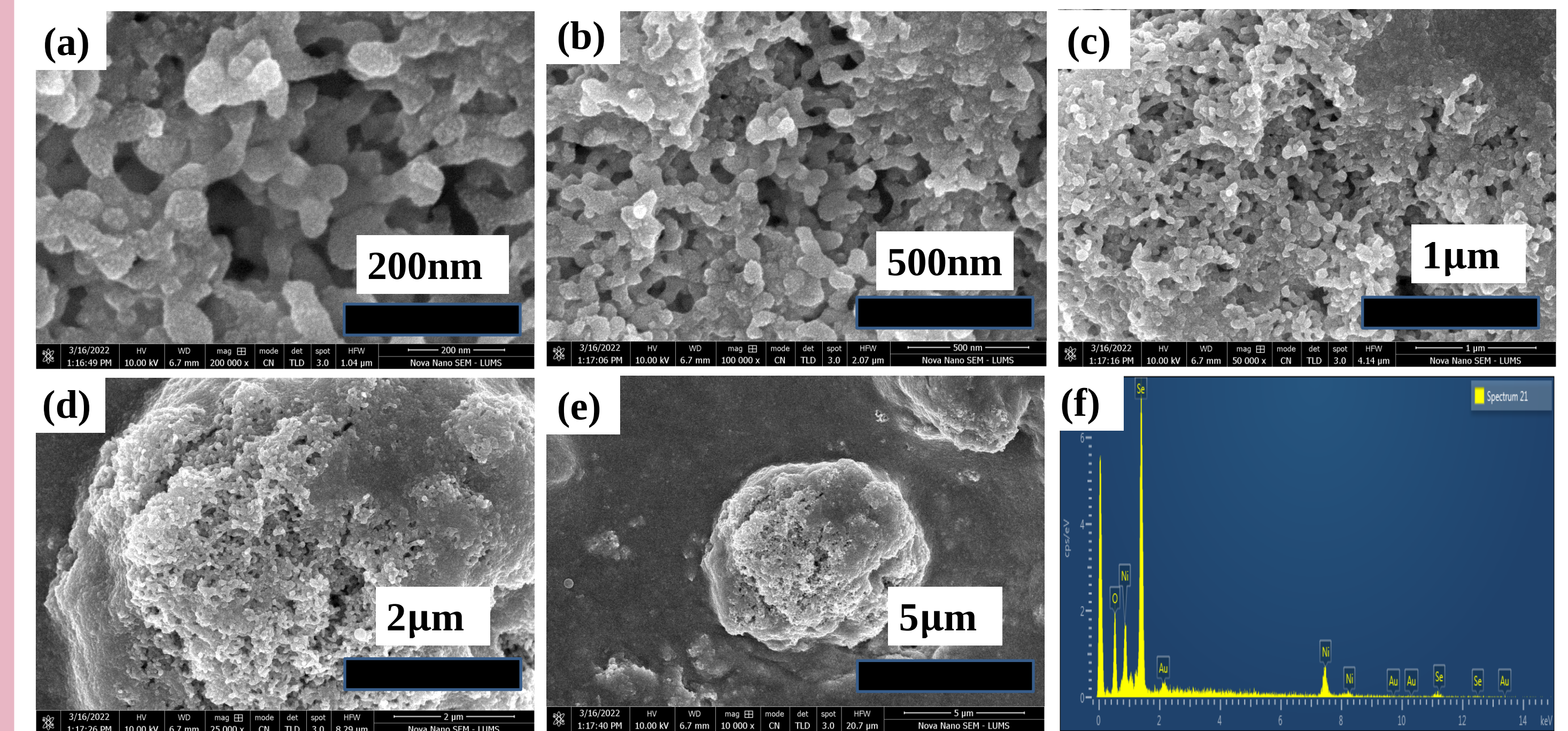
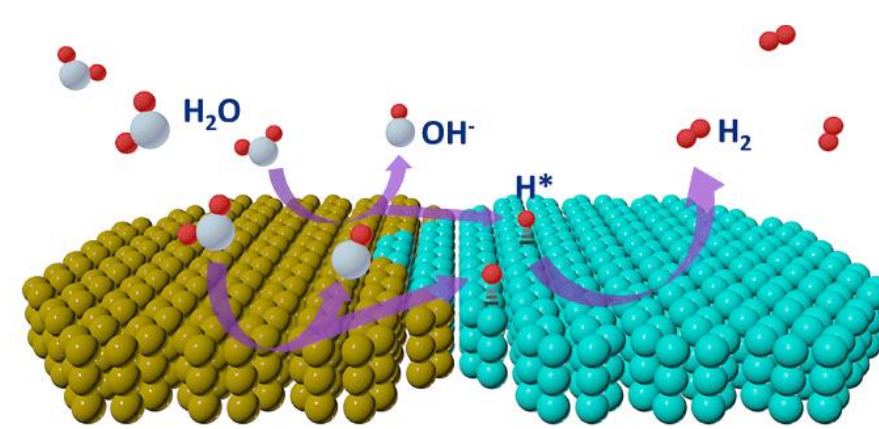


Figure 3. (a), (b), (c), (d), (e) are SEM images of NiSeB sample at different magnifications. (f) is EDS analysis of NiSeB sample.

Objective

The main objective of this research work is facile synthesis of catalytic material for EC water splitting.



The research objectives provide a way to fulfill UN Sustainable Development Goals No. 6, 7 and 13.

Methodology

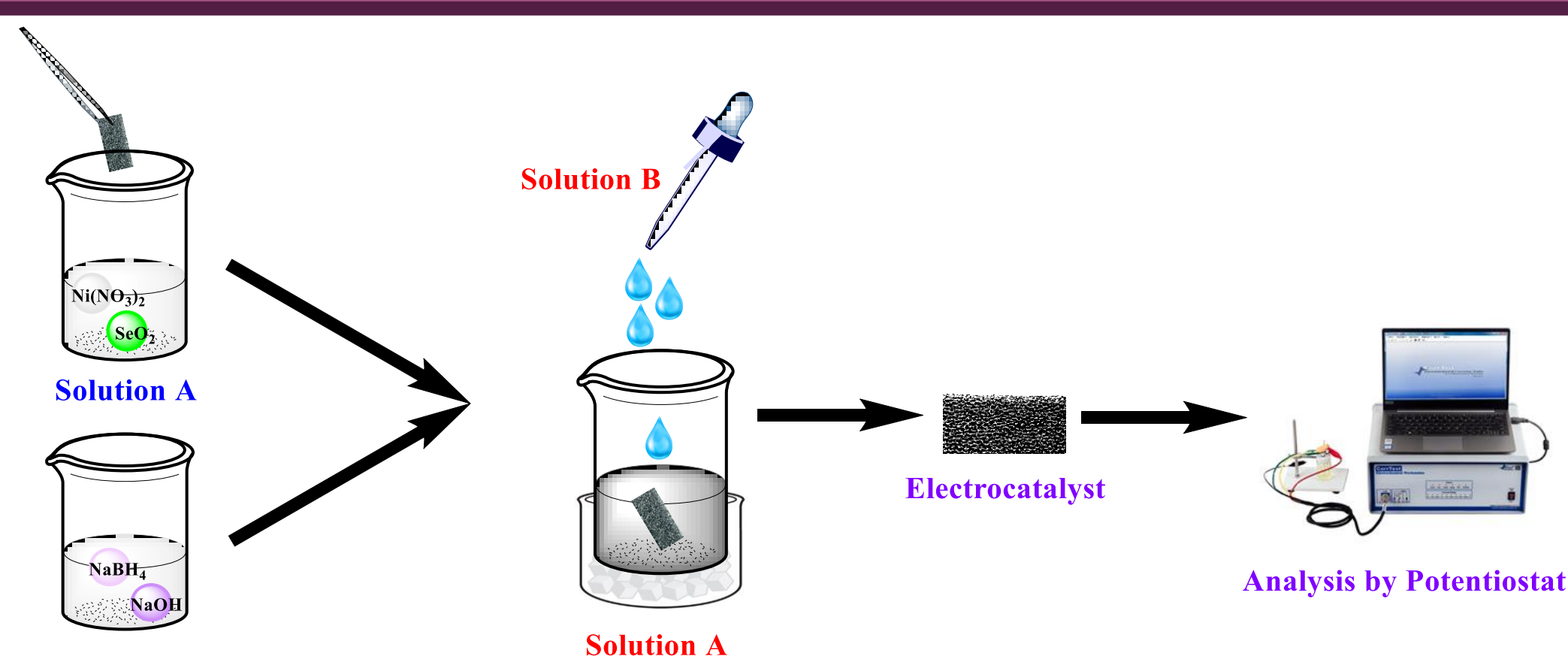


Figure 1. Schematic Diagram of NiSeB by in-situ Method

Electrochemical Test

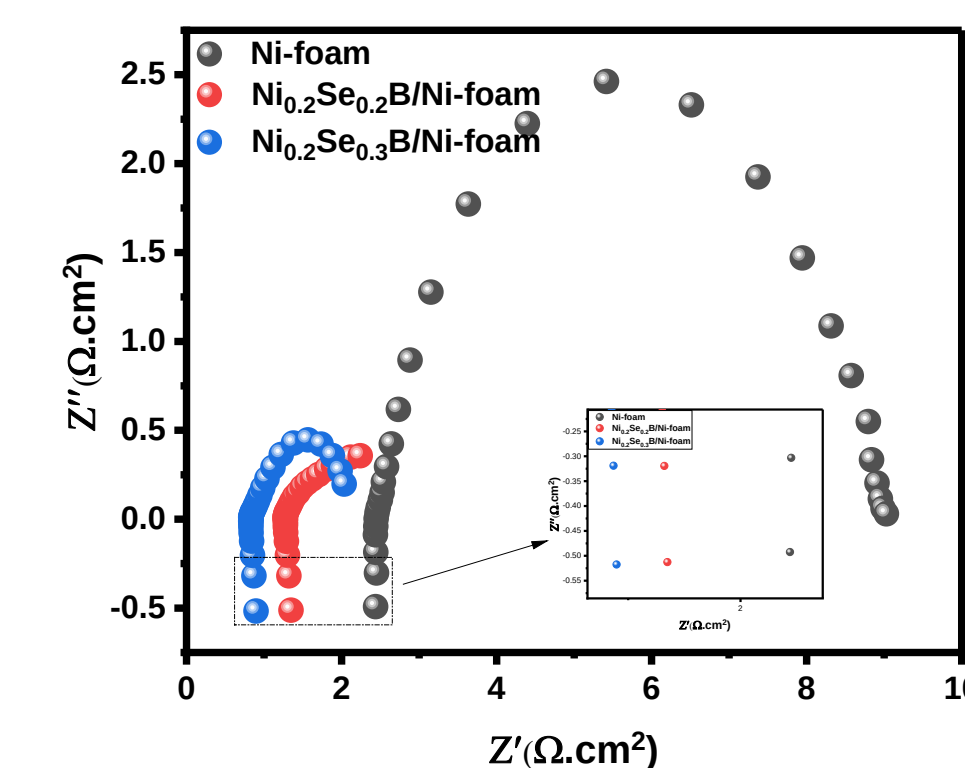
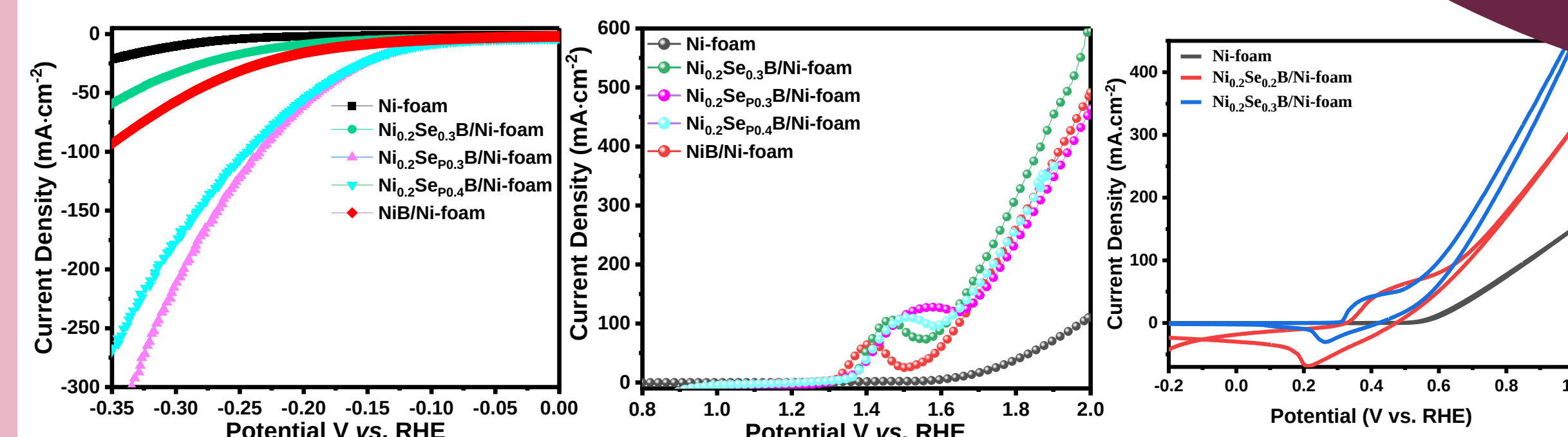


Figure 2. (a) Nyquist Plot for NiSeB samples. (b) LSV curves of HER for NiSeB samples. (c) LSV curves of OER for NiSeB samples. (d) CV curves for NiSeB samples.

Conclusion

- Excellent electrocatalytic activity and long-term stability.
- The fabrication process is low cost and simple.
- Performance of catalyst further improved by optimization.
- It is easy to extend to other technological devices.

Acknowledgements

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Stability Test

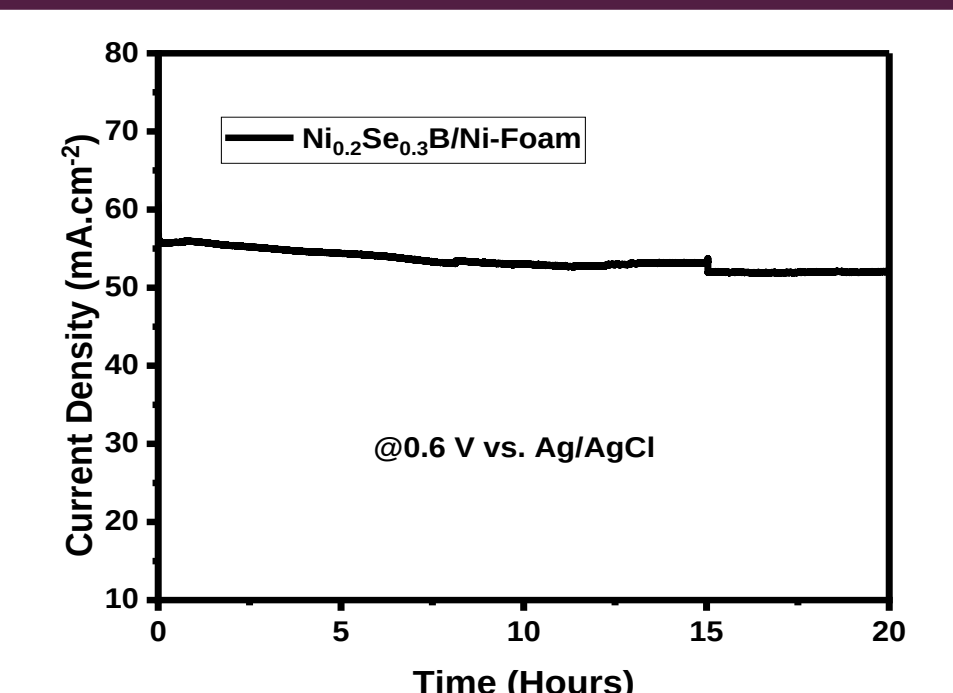


Figure 4. Chronoamperometric graph of optimized NiSeB sample

References

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