

Upcycling rust and plastic waste into an Fe-MOF for effective energy storage applications: transformation of trash to treasure

Rakesh Deka, Shaikh M. Mobin*

Department of Chemistry, Indian Institute of Technology, Indore, 453552, India

Email id: Phd1901231001@iiti.ac.in

Keywords:

1. Supercapacitor
2. Metal-Organic Framework
3. Waste management
4. Circular economy
5. Energy Density

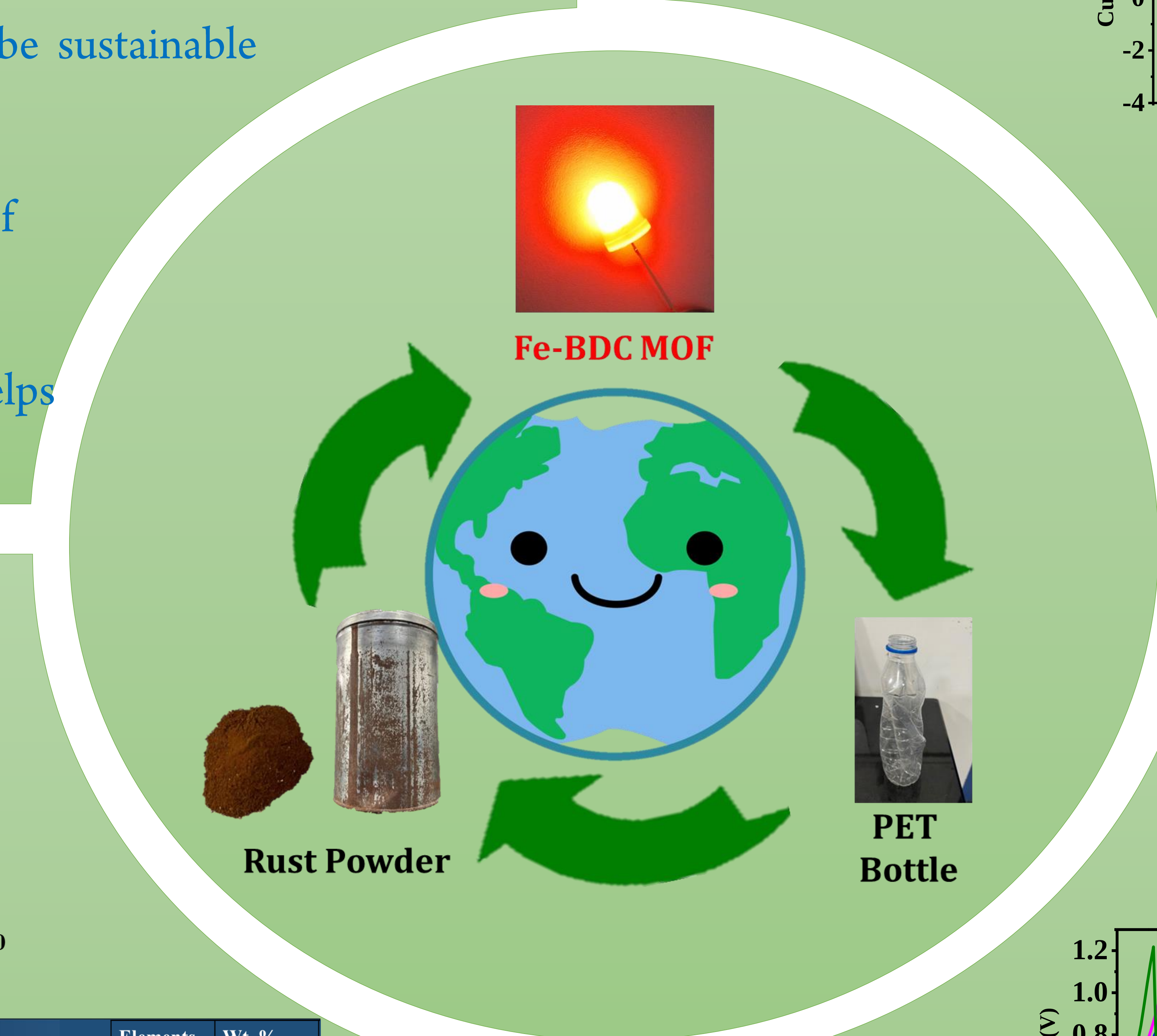
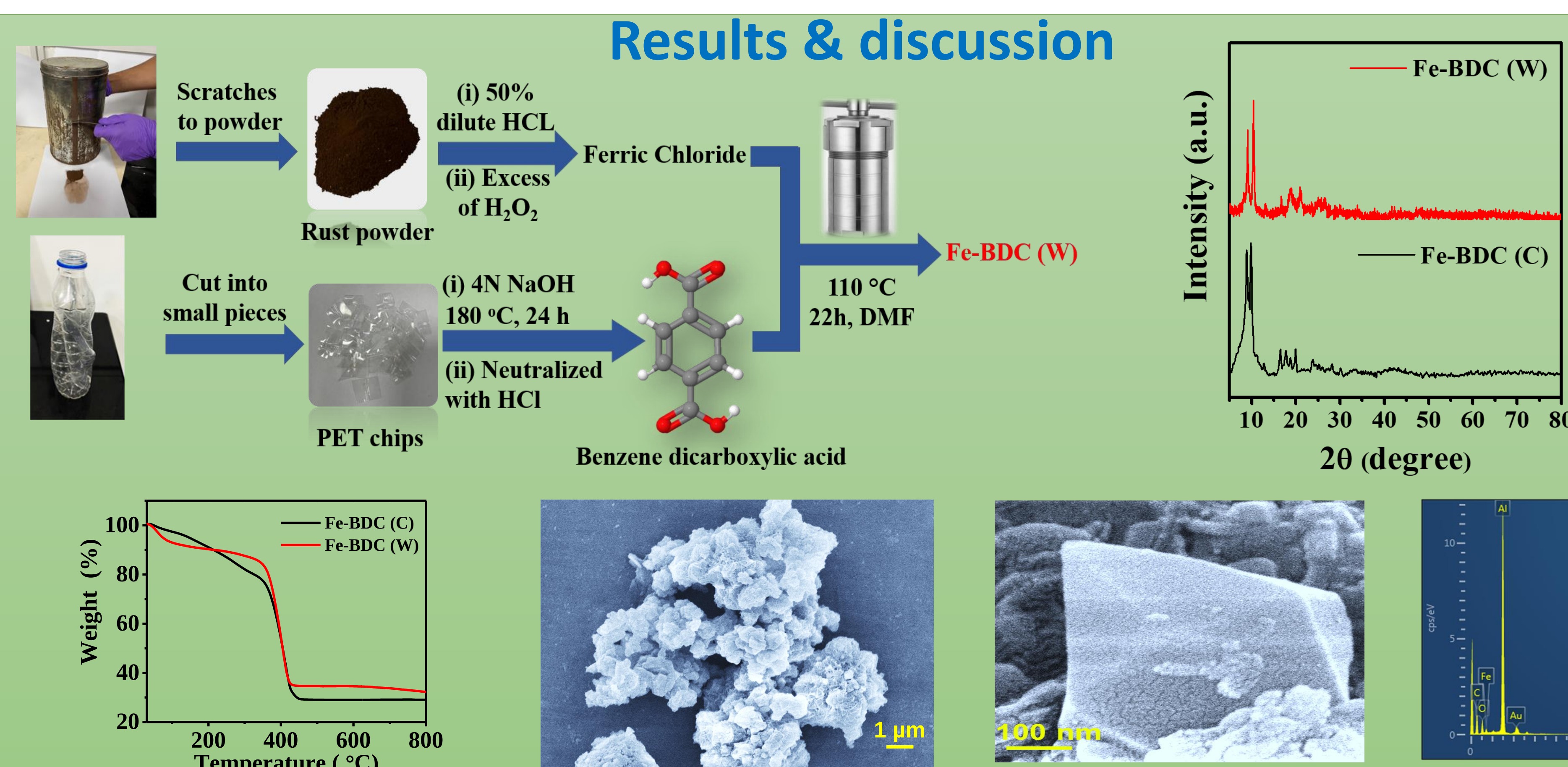
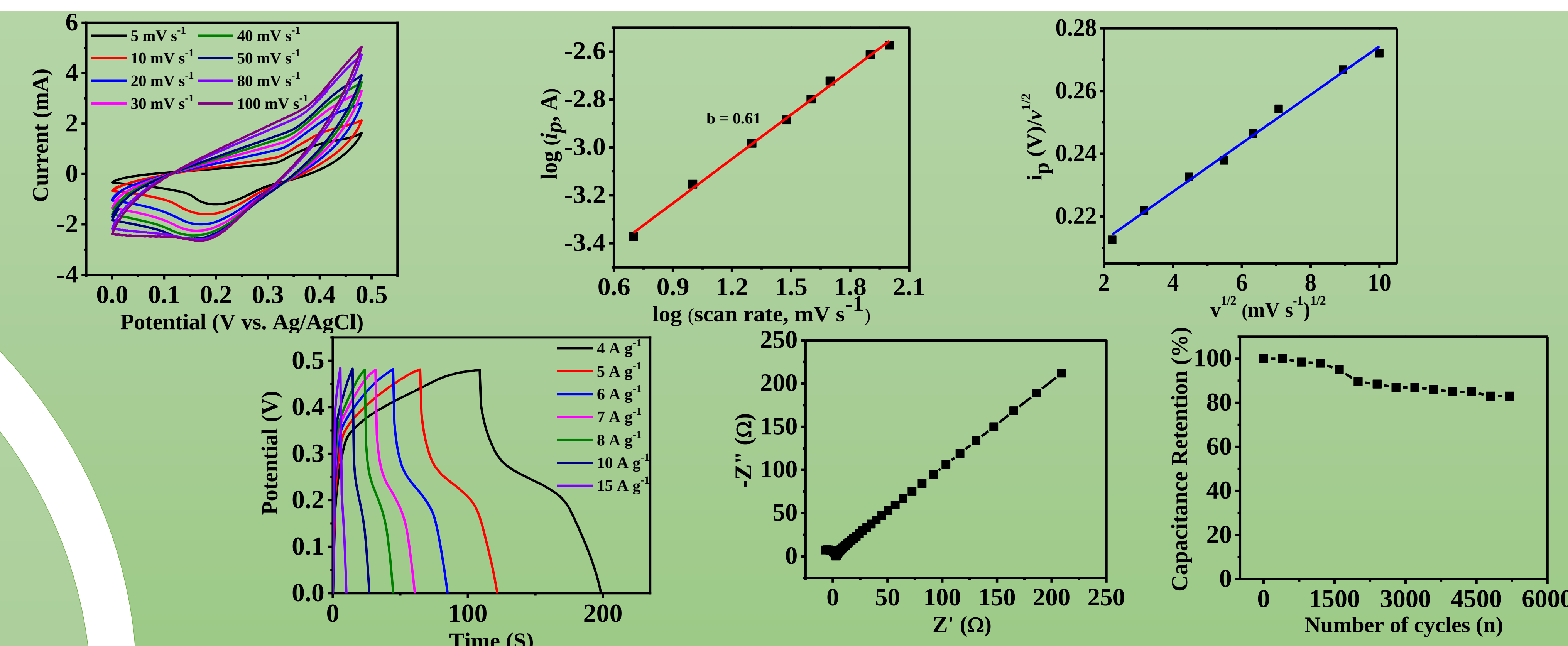
4th Commonwealth Chemistry Poster



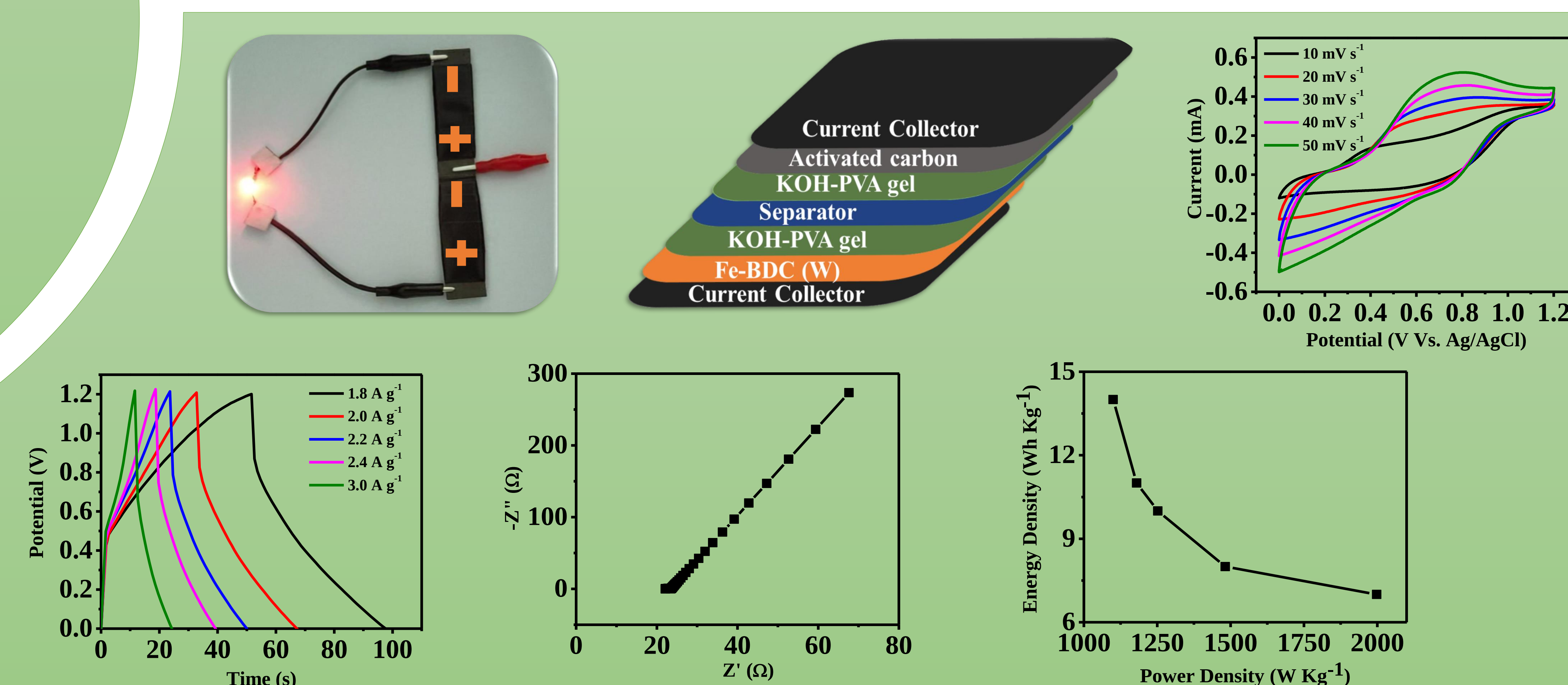
Introduction

- ✓ As our world inches into the future, the 'circular economy' comes increasingly more into focus.
- ✓ In order to obtain a circular economy in an industrial process, the process has to be sustainable and waste produced by the process has to be recyclable.
- ✓ Polyethylene terephthalate (PET) has been one of the most significant sources of plastic waste, as it is found in most of our single-use plastic bottles, cups, etc.
- ✓ The use of MOFs as electrode materials is due to their properties like porosity helps in accommodating electrolytes, and metal cations act as redox-active centers.

Three electrode studies of waste derived Fe-MOF



Two electrode studies of waste derived Fe-MOF



References

- 1) R. Deka, D. D. Mal, and S. M. Mobin, *Dalton Trans.*, 2023, 52, 8204–8210.
- 2) R. A. Sheldon and M. Norton, *Green Chem.*, 2020, 22, 6310 —6322.
- 3) E.-S. M. El-Sayed and D. Yuan, *Green Chem.*, 2020, 22, 4082 —4104.

Acknowledgments

