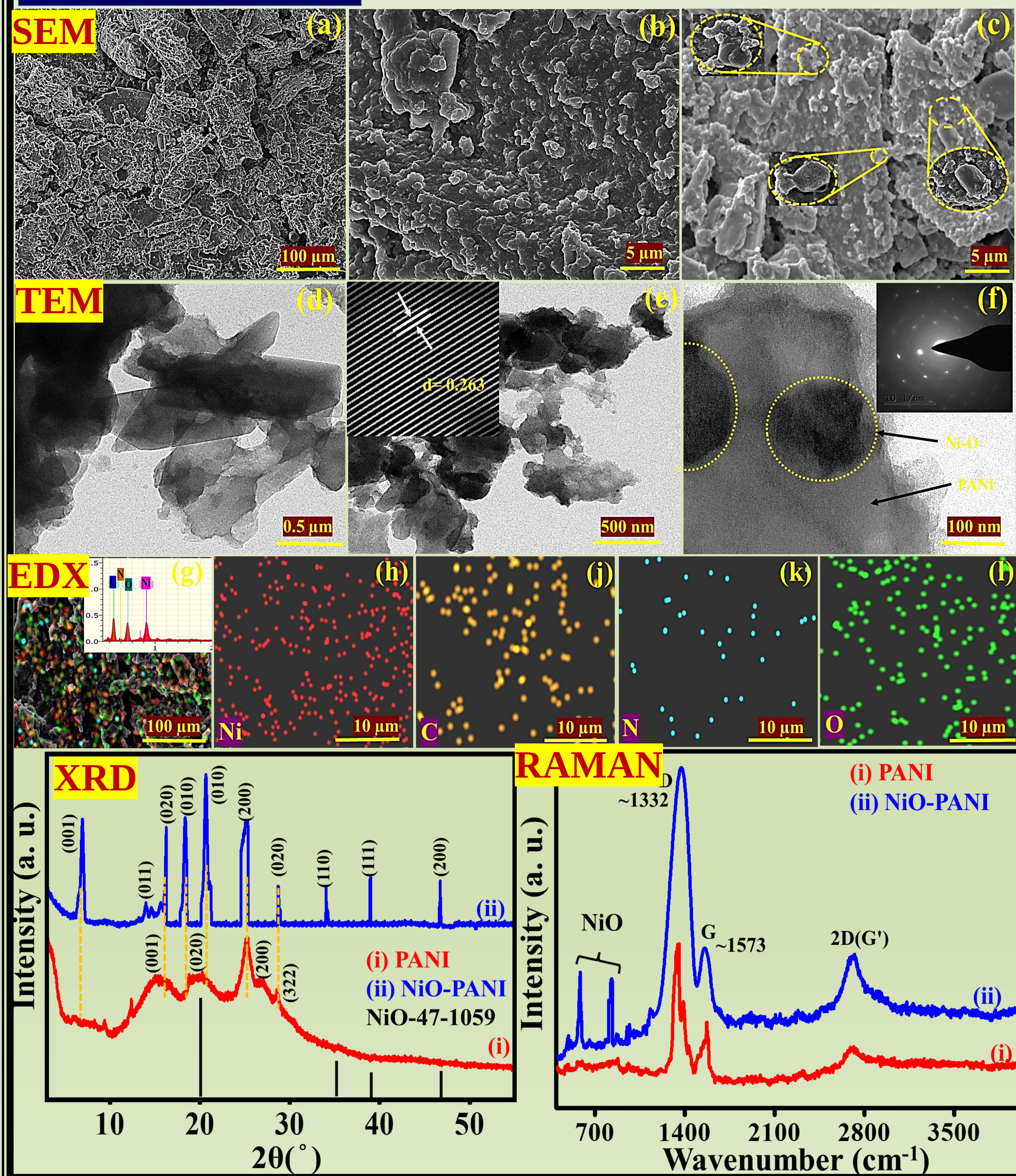


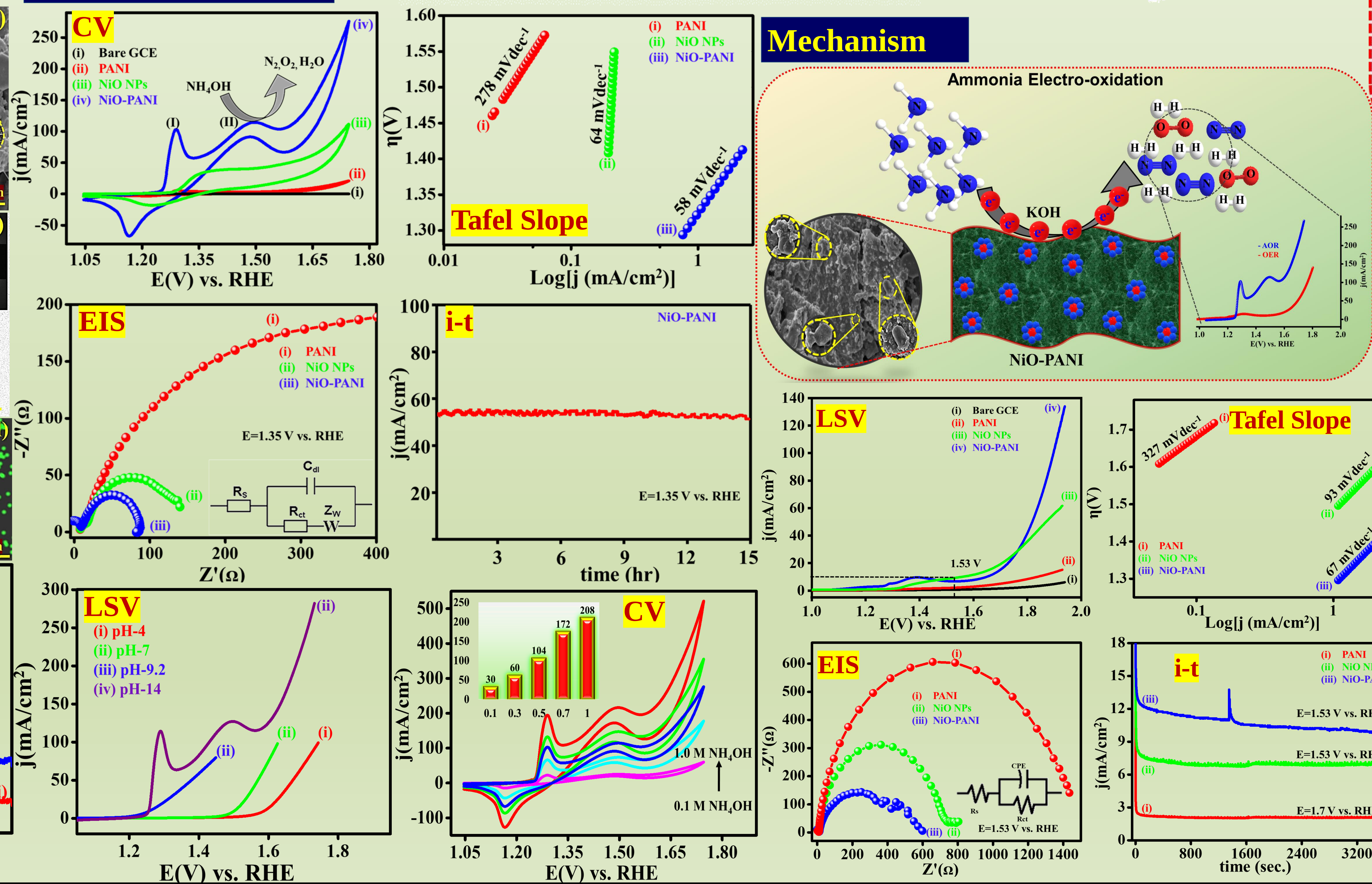
Why Ammonia (NH₃) Oxidation ?

- Ammonia is one of the most common pollutants present in the atmosphere, with highly reactive gas, strong pungent odor & and readily soluble in water.
- AOR is essential for most terrestrial, aquatic and all ecosystems and plays a major role in greenhouse gas production and environmental damage.
- Attractive choice for fuel cells with zero carbon emission.
- Key advantages of NH₃ based fuel cells are that contain 40% green hydrogen than methanol and other carbon-based fuels.
- Easy to store, transport, handle and liquefaction at low pressure.
- Ni is a cheaper, non-noble metal having high stability and excellent redox activity at the nanoscale which coupled with another potential candidate i.e. PANI extraordinary performance towards oxidative conversion of NH₃ to N₂ and H₂.

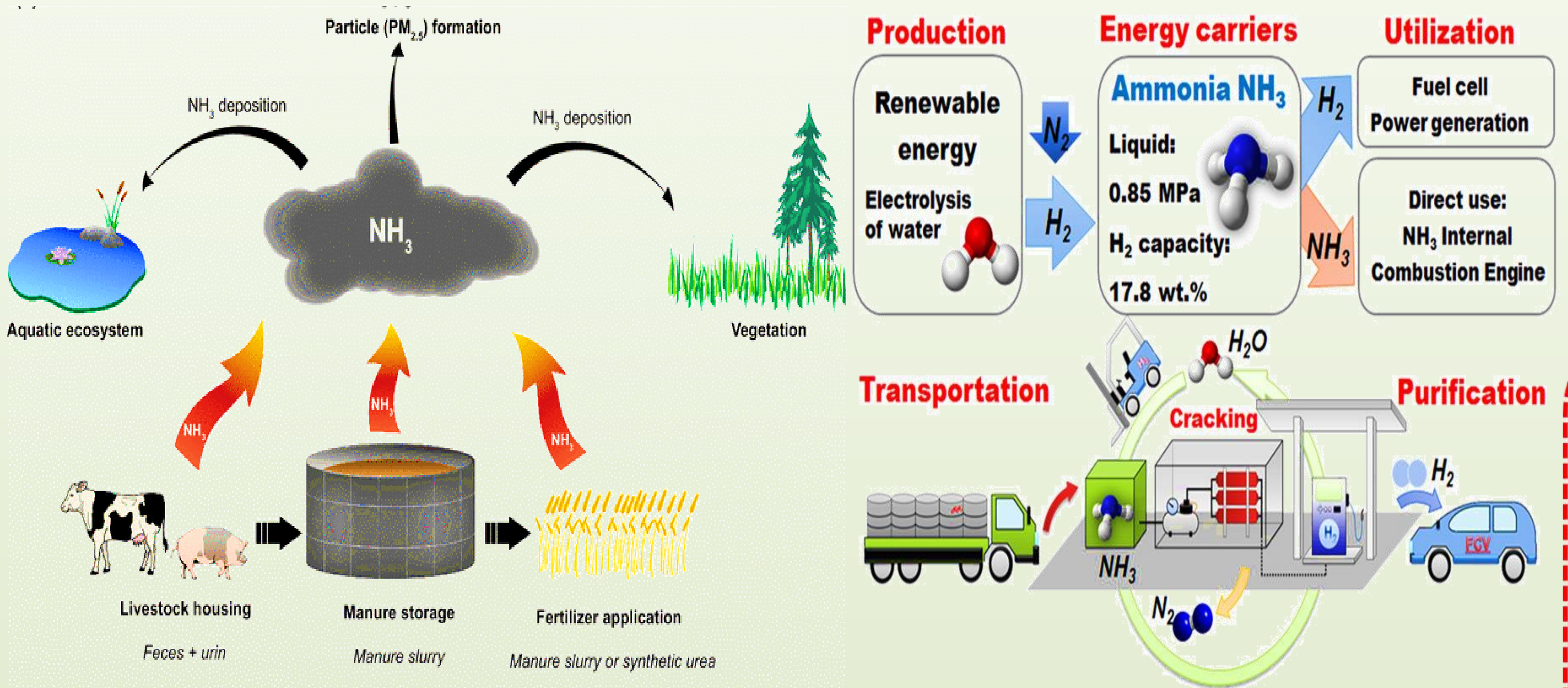
Characterization



Results & Discussion



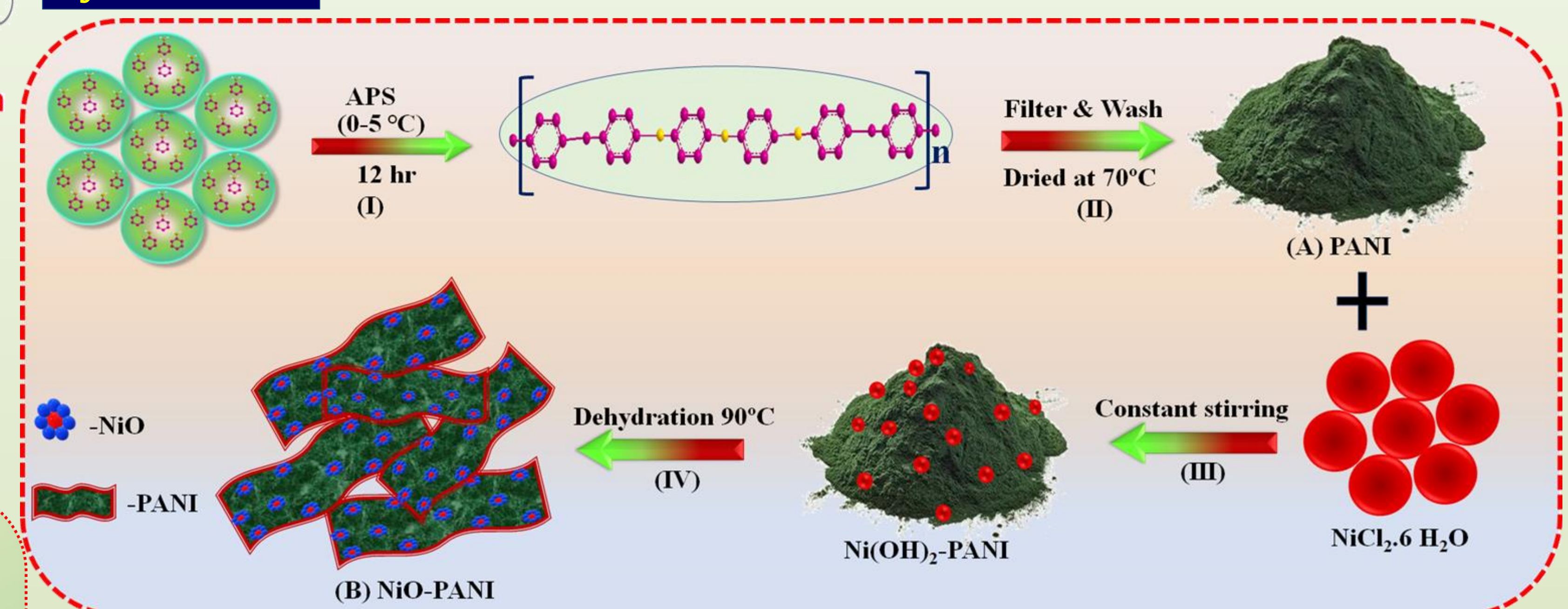
Common pollutant can be used as energy source



Objectives

- To synthesize nano electrocatalyst of NiO@PANI.
- Characterization of synthesized catalyst.
- Studies towards NH₃ oxidation and water oxidation reaction.
- And find out the possible electrochemical mechanism of the catalytic system.

Synthesis



Application

- The proposed approach will solve the major issue of water and air pollution due to the sticky nature of ammonia easily captured.
- Common agricultural waste byproducts are easily converted into renewable energy sources like green hydrogen generation, energy storage and transportation.
- AOR was studied due to its promising application in electrolysis of ammonia wastewater remediation, direct ammonia fuel cells and sensors.

Conclusion

- ✓ Successfully synthesized and well-characterized NiO doped on PANI electrocatalyst.
- ✓ NH₃ oxidation at low over potential with non reactive and stable N₂, O₂ & H₂ gas generation with net zero carbon emission.
- ✓ The proposed scheme shows an ultimate solution for energy crises and environmental pollution.

References

1. F. Almomani and M. Ali H Salah Saad, Int J Hydrogen Energy 46, 4678 (2021).
2. N. J. Bunce and D. Bejan, Electrochim Acta 56, 8085 (2011).