

Low Cost Zinc Air Battery Technology

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Why in News?

Recently, Scientists at SASTRA Deemed University, have developed a nanofluid electrolyte and waste-derived catalysts to enable electrically rechargeable zinc-air batteries (ZABs).

Zinc Air Battery

- **Type** - Metal air battery.
- **Chemistry** - Electricity generated via oxidation of zinc (anode) and reduction of oxygen (air cathode).
- **Electrolyte** - Often aqueous in rechargeable designs.
- **Advantages** - High theoretical energy density, abundant zinc, safer water-based chemistry.

Key Innovation - Nanofluid Electrolyte

- **Problem** - Conventional electrolytes need costly corrosion inhibitors, which hinder oxygen reaction kinetics.
- **Solution** - Dispersed **silica and zinc oxide nanoparticles** into standard electrolyte to nanofluid electrolyte.
- Adding silica and zinc oxide nanoparticles fixes corrosion and boosts efficiency, making zinc-air batteries cheaper, safer, and longer-lasting.

Waste Derived Materials

- **Filter Carbon** - Used water filters are turned into battery components, cutting material costs and reducing landfill waste.
- **Upcycled Masks** - Old face masks become high-performance carbon catalysts, matching expensive platinum in battery efficiency.
- **Eco-Friendly Impact** - Recycling trash into battery parts creates cheaper, greener energy storage while solving environmental waste

problems.

Reference

[DST | Zinc Air Battery](#)

