

Organic Catholyte Material for Aqueous organic flow battery IITM Technology Available for Licensing

Problem Statement

• **Redox flow battery** systems store energy in **electrolyte solutions** (a positive solution & a negative solutions) which flowed through respective electrode compartments of the cells of a multi-cell electrochemical reactor during charge & discharge process.

• Conventional **vanadium redox flow battery systems** use **vanadium ions** (100%) for gigawatts(GW) **energy storage** applications. However said **vanadium** is one of **scarce material**, wherein **88% of total vanadium** (15MMT) available in earth are **from China, Russia, & Australia**.

• Hence, there is a need exists for alternatives like **organic compound, which are ubiquitous** across the globe, which may be addressed the solutions of above shortcomings in term of economic significant point of view also.

Technology Category/ Market

Technology: Organic Catholyte Material for Aqueous organic flow battery;

Industry: Renewable Energy Storage, Battery;

Applications: Renewable energy storage, Electric vehicle, Solar & others;

Market: The global Aqueous organic redox flow battery market is projected to reach **\$718M** by **2030**, growing at a CAGR of **15.6%** during the forecast period (2021-**2030**).

Technology

- Present invention describes an **organic catholyte material** for **aqueous organic flow battery (Redox Flow Battery (RFB))**.
- The organic flow battery comprises at least **one high voltage organic redox material**.
- The high voltage ubiquitous **organic redox material series** are **stable, soluble** and **reversible in RFB applications**.

Image

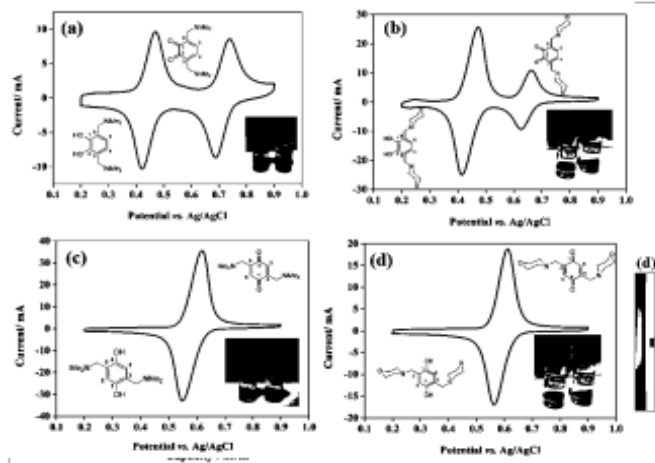


Fig.1: Illustrates graphical representation showing the cyclic 2 voltammogram of catholyte compounds

Key Features / Value Proposition

❖ Technical Perspective:

- The invention proposes **use of Dopamine & its simple derivatives** envisaged for exploration as **catholyte**.
- If used in vanadium redox flow battery, could reduce vanadium need by 50%.

❖ Industrial Perspective:

- A cost effective and safe aqueous based energy system

Intellectual Property

IITM IDF Ref. 2067;

Patent Application No:202141000317;

TRL (Technology Readiness Level)

TRL- 3, Proof of Concept ready & validated

Research Lab

Prof. Kothandaraman Ramanujam,

Prof. Indrapal Singh Aidhen,

Dept. of Chemistry

CONTACT US

Dr. Dara Ajay, Head

Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:

<https://ipm.icsr.in/ipm/>

Email: smipm-icsr@icsrpis.iitm.ac.in

sm-marketing@imail.iitm.ac.in

Phone: +91-44-2257 9756/ 9719