Small Organic Molecule Based Flow Battery

Technology Summary

Molecules that readily protonate / deprotonate in aqueous solution

Low chemicals cost: Enables low cost/kWh
Rapid redox kinetics: Enable low cost/kW
Small org. molecules: Enable inexpensive separator
All-liquid storage: Enable inexpensive BOS & high cycle life
Aqueous electrolyte: Enables fireproof operation
Non-toxic: Opens residential & commercial markets

Quinone-Bromide chemistry in hand:
→ cost of chemicals at scale: <$27/kWh
→ peak power density: > 600 mW/cm²
→ carbon paper electrodes
→ no catalyst
→ 1000x faster kinetics than VO₂⁺/VO²⁺
→ capacity retention >99.8% / cycle (700 cycles)
→ current efficiency: >98.3%
→ Open Circuit Voltage > 1 Volt (refined chemistry)

Quinone-Quinone chemistry under development:
→ Open Circuit Voltage > 1 Volt
→ Peak power density > 50 mW/cm²

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