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UNIVERSITY OF WISCONSIN-MADISON

## IONIC CYCLIC NITROXYL RADICAL OLIGOMERS

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**WARF: P210314US02**

Inventors: Dawei Feng, Patrick Sullivan, Xiuliang Lyu, Wenjie Li

### The Invention

UW researchers have designed and synthesized a series of cathode materials for aqueous redox flow batteries by dimerization of TEMPO into ionic structures. TEMPO radicals have high voltage but are too small and diffuse through the membrane. Efforts to solve this problem by adding functional groups result in reduced capacity since there are fewer active redox species per unit volume. By dimerizing TEMPO, the size can be increased while maintaining the active species density. These TEMPO ionic dimers exhibit high solubility in water while offering extremely stable cycling performance when applied as the catholyte in aqueous redox flow batteries. Pairing these ionic TEMPO dimers with previously developed anolyte materials (P210214US02) should result in the highest energy density in aqueous flow batteries that can be stably cycled.

#### Tech Fields

- [Clean Technology : Energy storage, delivery & resource efficiencies](#)
- [Materials & Chemicals : Synthesis](#)

For current licensing status, please contact Michael Carey at [mccarey@warf.org](mailto:mccarey@warf.org) or 608-960-9867

