RFB’s involve specific testing techniques that we are developing to evaluate the bench flow cell test bed at GVSU with organic electrolytes. In preparation for testing of Vinazene electrolytes the cell was tested using Quinone-based electrolytes in aqueous or mixed-organic solvents. Cyclic voltammetry was used to probe the kinetics and reduction potentials were observed as a function of pH, and charge/discharge runs were made in the flow cell. The species under investigation are 2,3,6,7-tetracyano-9,10,-hexaaazaanthracenes where the groups substituted at the 9,10 positions are \( R_1 \) and \( R_2 \). We call these compounds “Z” for short. The solubility and stability of Z are controlled by varying the \( R_1 \) and \( R_2 \) functionalities.

**Flow Batteries are of great utility for energy storage by de-coupling energy and power.**

**An organic active material provides a competitive, greener alternative.**

**Vinazene SBIR No. DE-SC0007662 endeavors to develop an organic RFB using proprietary compounds, combining unique manufacturing and operational advantages including single substance, larger OCP and lower cost.**

**Rapid synthetic pathway to ~20 Compound “Z” Derivatives**

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A patent, US 8742107, was issued to Vinazene in June 2014 for novel methods of synthesizing new Z derivatives.

**Large Scale Synthesis of Precursor “Z” underway**

The scale-up of the precursor to the Z derivatives also makes use of newly developed synthetic methodology.

**Validation Of Bench scale 4W RFB**

RFB’s involve specific testing techniques that we are developing to evaluate the bench top flow cell test bed at GVSU with organic electrolytes. In preparation for testing of Vinazene electrolytes the cell was tested using Quinone-based electrolytes in aqueous or mixed-organic solvents. Cyclic voltammetry was used to probe the kinetics and reduction potentials were observed as a function of pH, and charge/discharge runs were made in the flow cell.

**Design and Fabrication of a 40W RFB**

Engineering concept of a 40W RFB prototype currently under development. This integrated prototype will demonstrate commercialization readiness for new electrolyte materials.

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