The Development of New Power Storage Devices Based on Organic Heterocyclic Aromatic Compounds

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In an effort to develop a rechargeable power source that can better store energy from sources such as windmills and solar panels, experiments were conducted using a cell made of MnO_2 cathode with various anodes including carbon felt, glassy carbon, and copper. The power source, unlike any other, stores energy in the form of a reduced organic dye. Various organic molecules were utilized including methyl viologen, indigo carmine, methylene blue, and methylene green. Through the use of various charging schemes and cell morphologies, attempts were made to maximize power output. The best resulting cell utilized a copper anode storing the charge in the reduced form of the organic molecule methylene green. This cell produced approximately 20 mA per square centimeter of anode surface. This current was generated at about 1 volt. Unlike a lithium ion battery, this inexpensive power source contains no flammable materials.

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