

with a alkaline metal containing oxidizing agent. The ratio of the transition metal to the alkaline metal should be approximately 0.5:1 to 1.2:1.

**5532082**

**SOLID ELECTROLYTES CONTAINING  
TETRABUTYL AMMONIUM  
THIOCYANATE AND  
ELECTROCHEMICAL CELLS PRODUCED  
THEREFROM**

Saidi Eileen San Jose, CA, 95136, UNITED STATES

Solid electrolytes containing a source of lithium cations and a source of thiocyanate anions and methods for preparing electrolytic cells from such solid electrolytes are provided. Preferably the solid electrolyte includes LiPF<sub>6</sub> and (CH<sub>3</sub>(CH<sub>2</sub>)<sub>3</sub>)<sub>4</sub> NSCN. The tetrabutyl ammonium cation also acts as a surfactant which improves the coatibility of the electrolyte mixture prior to being cured. The thiocyanate anion improves the lithium plating process by adsorbing onto and modifying the lithium anode surface.

**5532083**

**FLEXIBLE CARBON FIBER ELECTRODE  
WITH LOW MODULUS AND HIGH  
ELECTRICAL CONDUCTIVITY,  
BATTERY EMPLOYING THE CARBON  
FIBER ELECTRODE, AND METHOD OF  
MANUFACTURE**

McCullough Francis P Lake Jackson, TX, UNITED STATES

A novel flexible carbon article for an electrode is disclosed for use in an electrical storage device in which the flexible carbon article, such as a planar sheet of a plurality of substantially parallel fibers or ribbons, and in which the fibers or ribbons have a Young's modulus of less than 1 MM psi (6.89 Gpa). The invention also resides in an electrical energy storage device, such as a secondary battery, comprising a water impermeable housing having at least one and preferably more than two cells in series, wherein a battery containing at least two cells also contains at least one shared bipolar

electrode made of the flexible carbon article. Each cell has a foraminous separator between each pair of electrodes and contains an electrolyte comprising an ionizable salt in a non-aqueous fluid. Also disclosed are methods of making the electrode from an unfiltered precursor polymer and from a sub-acrylic polymer.

**5532084**

**MANGANESE DIOXIDE PRODUCT**

Wang Enoch I; Bowden William; Lin Lifun Mansfield, MA, UNITED STATES assigned to Duracell Inc

The invention relates to the manufacture of manganese dioxide by a chemical process. The resulting product takes the form of gamma manganese dioxide particles characterized by filament-like protrusions of ramsdellite manganese dioxide jutting out from the surface of the particles. The manganese dioxide particles having such features can be manufactured by reacting manganese sulfate with sodium peroxodisulfate in an aqueous solution. The process can be controlled to yield high density manganese dioxide. The manganese dioxide formed in the process can be deposited directly onto the surface of electrolytic manganese dioxide (EMD). The manganese dioxide product is particularly suitable for use as a cathode active material in electrochemical cells.

**5534576**

**SEALANT FOR ELECTROCHEMICAL  
CELLS**

Grot Walther Chadds Ford, PA, UNITED STATES assigned to E I Du Pont de Nemours and Company

A sealant composition comprises a dispersion of a fluorocarbon polymer with particles no larger than 25 micrometers in a low volatility liquid and up to 50% of a higher volatility liquid. Also covered is an applicator for applying the sealant to the gasket of an electrochemical cell.