

fabricated in a one heating step process from multi-functional organic monomers. The material is then reheated in the presence of a lithium salt such as  $\text{LiNO}_3$ ,  $\text{Li}_3\text{PO}_4$  or  $\text{LiOH}$ . Electrodes so fabricated may be incorporated into electrochemical cells as the anode thereof.

**5637413**

**OVERVOLTAGE DISCONNECT CIRCUIT  
FOR LITHIUM ION BATTERIES**

Fernandez Josacu e Mack Erika D Lawrenceville, GA, UNITED STATES assigned to Motorola Inc

A lithium ion or similar lithium secondary battery pack includes an overvoltage disconnect circuit having an overvoltage disconnect switch, a voltage detector, and a delay circuit. The battery pack is connectable to a recharger which was not designed to accommodate the charge regime of the lithium ion cell or cells, such as a nickel system recharger. The voltage detector samples the battery voltage and changes its output signal if the battery voltage reaches an upper voltage threshold. The output of the voltage detector will not revert back until the battery voltage drops to a lower voltage threshold, which is below the upper voltage threshold.

**5639575**

**NON-AQUEOUS LIQUID ELECTROLYTE  
SECONDARY BATTERY**

Omaru Atsuo; Nagamine Masayuki; Date Naoyuki Kanagawa, JAPAN assigned to Sony Corporation

A non-aqueous liquid electrolyte secondary battery using a carbon material satisfying predetermined conditions of true density and parameters of crystalline structure as an anode material, a transition metal composite oxide having predetermined ion supply capability as a cathode material, and ethylene carbonate as a non-aqueous solvent, is disclosed. The carbon material has a true density of  $2.2 \text{ g/cm}^3$  and greater, an interplanar distance of (002) plane of between 0.375 and 0.338 nm, inclusive a C-axis crystallite size of the (002) plane of 20.0 nm and greater and a G value in Raman spectrum of 2.5 and greater. The transition metal composite oxide contains lithium of an amount equivalent to a charge/discharge

capacity of 300 mAh and greater per unit weight of the carbon material. The carbon material forming the anode has a grain diameter of 1  $\mu\text{m}$  and greater. The non-aqueous solvent is a mixed solvent of ethylene carbonate and chain carbonic ester. As the chain carbonic ester, diethyl carbonate, dimethyl carbonate or methylethyl carbonate is employed.

**5641465**

**LITHIUM MAGANESE OXIDE  
COMPOUND AND METHOD OF  
PREPARATION**

Ellgen Paul C; Andersen Terrell Oklahoma City, OK, UNITED STATES assigned to Kerr-McGee Chemical Corporation

A method for manufacturing  $\text{Li}_2\text{Mn}_2\text{O}_4$  comprising the steps of providing beta- $\text{MnO}_2$  or lambda- $\text{MnO}_2$ ; providing a source of lithium; dissolving lithium from the lithium source in a liquid medium in which lithium generates solvated electrons or the reduced form of an electron-transfer catalyst; and contacting the beta- $\text{MnO}_2$  or lambda- $\text{MnO}_2$  with the liquid medium containing the dissolved lithium and the solvated electrons or the reduced form of the electron-transfer catalyst.

**5641468**

**LITHIUM MANGANESE OXIDE  
COMPOUND AND METHOD OF  
PREPARATION**

Ellgen Paul C Oklahoma City, OK, UNITED STATES assigned to Kerr-McGee Chemical Corporation

A method for manufacturing  $\text{Li}_2\text{Mn}_2\text{O}_4$  comprising the steps of providing  $\text{LiMn}_2\text{O}_4$ ; providing a source of lithium; dissolving lithium from the lithium source in a liquid medium in which lithium generates solvated electrons or the reduced form of an electron-transfer catalyst; and contacting the  $\text{LiMn}_2\text{O}_4$  with the liquid medium containing the dissolved lithium and the solvated electrons or the reduced form of the electron-transfer catalyst.