

rechargeable battery cell mounted within the x-ray cell holder enclosure comprises an electrolyte/separator element interposed between positive and negative electrodes. A current collector element formed of an electrically-conductive open-mesh grid is disposed between the positive electrode and the separator to enable ion-conducting contact of the electrode and separator while maintaining electrical continuity between the electrode and an external x-ray cell holder terminal. As a result of this arrangement, the positive electrode need not contact the window element to establish an electrical battery circuit, but may be sufficiently spaced from the window to avoid electrolytic corrosion of the beryllium element. The in situ x-ray electrochemical cell holder and battery cell structure allow for continuous monitoring of the structural changes in electrode materials during charge/discharge cycling.

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### **FABRICATING SOLID CARBON POROUS ELECTRODES FROM POWDERS**

Kaschmitter James L; Tran Tri D; Feikert John H; Mayer Steven T Pleasanton, CA, UNITED STATES assigned to Regents of the University of California

Fabrication of conductive solid porous carbon electrodes for use in batteries, double layer capacitors, fuel cells, capacitive deionization, and waste treatment. Electrodes fabricated from low surface area (<50 m<sup>2</sup>/gm) graphite and cokes exhibit excellent reversible lithium intercalation characteristics, making them ideal for use as anodes in high voltage lithium insertion (lithium-ion) batteries. Electrodes having a higher surface area, fabricated from powdered carbon blacks, such as carbon aerogel powder, carbon aerogel microspheres, activated carbons, etc. yield high conductivity carbon composites with excellent double layer capacity, and can be used in double layer capacitors, or for capacitive deionization and/or waste treatment of liquid streams. By adding metallic catalysts to be high surface area carbons, fuel cell electrodes can be produced.

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### **OXYGEN ION-CONDUCTING DENSE CERAMIC**

Balachandran Uthamalingam; Kleefisch Mark S; Kobylinski Thaddeus P; Morissette Sherry; Pei Shiyou Hinsdale, IL, UNITED STATES assigned to Amoco Corporation

Preparation, structure, and properties of mixed metal oxide compositions containing at least strontium, cobalt, iron and oxygen are described. The crystalline mixed metal oxide compositions of this invention have, for example, structure represented by (\*See Patent for Tabular Presentation\*) PS where x is a number in a range from 0.01 to about 1, alpha is a number in a range from about 1 to about 4, beta is a number in a range upward from 0 to about 20, and delta is a number which renders the compound charge neutral, and wherein the composition has a non-perovskite structure. Use of the mixed metal oxides in dense ceramic membranes which exhibit oxygen ionic conductivity and selective oxygen separation, are described as well as their use in separation of oxygen from an oxygen-containing gaseous mixture.

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### **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 Li<sub>2</sub>MbMn<sub>2</sub>-bO<sub>4</sub> which comprises the steps of providing LiMbMn<sub>2</sub>-bO<sub>4</sub>; providing a lithium salt; forming a mixture of the LiMbMn<sub>2</sub>-bO<sub>4</sub> and lithium salt in a liquid medium; adding a reducing agent to the mixture; heating for sufficient time to effect substantially complete conversion; and separating the product Li<sub>2</sub>MbMn<sub>2</sub>-bO<sub>4</sub>.