A porous film, a process for producing the same, a battery separator comprising the porous film, and a battery having incorporated therein the separator are disclosed. The porous film comprises a polyethylene and a polypropylene as the essential components, wherein the polyethylene content in the total weight of polyethylene and polypropylene is from 2 to 40% by weight and the polyethylene content is changed in the direction of the thickness of the film, and is produced by forming a laminate film comprising at least one polypropylene layer and at least one layer of a mixture of polyethylene and polypropylene as the essential components, the polyethylene content in the film being from 2 to 40% by weight, uniaxially stretching the laminate film at a low-temperature range of from -20 degrees C. to 80 degrees C. and then stretching the film at a high-temperature range of from 90 degrees C. to 150 degrees C.

**5480924**

## CONDUCTIVE POLYMER DOPED BY A SULPHONATED CYCLODEXTRIN SALT AND DEVICE FOR OBTAINING AND/OR SUPPLYING AN ACTIVE SUBSTANCE INCORPORATING SAID POLYMER

Vieil Eric; Bidan Gerard; Gadelle Andree; Mendes-Viegas Maria-Fatima Meylan, FRANCE assigned to Commissariat a l'Energie Atomique

Conductive polymer doped by a sulphonated cyclodextrin salt and device for obtaining and/or supplying an active substance incorporating said polymer. The dopant used has the following formula (I): (*See Patent for Chemical Structure*) (I) in which n is an integer between 2 and 50, M+ is Na+, Li+, K+ Mg+ 1/2 or NH4+ and R represents -SO3-M+ or -OH, whereby R can differ from one cycle to the other. The doped conductive polymer can be used as an active electrode material in an electrochemical device.

**5482795**

## SOLID ELECTROLYTE UTILIZING A POLYMERIC MATRIX OBTAINED BY THE POLYMERIZATION OF A SUBSTITUTED ALLYLIC CHLOROFORMATE

Chaloner-Gill Benjamin Santa Clara, CA, 95054, UNITED STATES

This invention is directed to a single phase solid solvent-containing electrolyte having recurring units derived from a substituted allylic chloroformate incorporated within the solid polymeric matrix of the solid electrolyte. A novel electrolytic cell that incorporates the subject electrolyte also is provided. The specific molecular structure exhibited by such solid polymeric matrix is believed to advantageously facilitate the positioning of an inorganic ion salt and solvent between adjacent polymeric molecules during service within the solid electrolyte.

# *LITHIUM BATTERY*

**5474752**

## METHOD OF PRODUCING ACTIVE CATHODE MATERIAL FOR LITHIUM SECONDARY BATTERY

Yamamoto Yoshikatsu Fukushima, JAPAN assigned to Sony Corporation

A method of producing active cathode material for lithium secondary battery is provided. In accordance with this invention, a mixture of a lithium salt and a transition metal salt is baked in oxygen atmosphere, wherein the oxygen pressure during baking is about 147.1 kPa or more. The lithium transition metal compound oxides prepared have the composition, LixNiyM1-yO2, wherein M is one kind of transition metal or more, and x and y respectively have the values 0.05< or =x< or =1.10 and 0.5< or =y< or =1.0. The active cathode material for a lithium secondary battery according to this invention, provides lithium transition metal compound oxides which are uniform in composition and characteristic, and exhibit excellent functioning as an active cathode material. Lithium secondary batteries produced therewith exhibit excellent cycle characteristics, high energy densities and low material costs, are of uniform quality and exhibit no unevenness of battery capacity.