

It comprises a mixture including an active material having reversibility for charging and discharging, and a whisker which is chemically and electrochemically inert. Said active material is a substance capable of reversibly intercalating and deintercalating lithium. Said mixture includes a binding agent and constitutes a solid structural body. Said whisker is at least one selected from the group consisting of silicon carbide whisker, silicon nitride whisker, potassium titanate whisker and aluminum borate whisker.

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### NONAQUEOUS ELECTROLYTE SECONDARY BATTERIES

Okuno Hiromi; Koshina Hizuru; Kawahara Takayuki; Hasegawa Katsuaki Osaka, JAPAN assigned to Matsushita Electric Industrial Co Ltd; Mitsubishi Petrochemical Company Limit

A nonaqueous electrolyte secondary battery having excellent cycle life characteristic, stability in storage at high temperatures and low-temperature characteristic, which is provided with an anode including a carbon material capable of doping and undoping lithium ion, a nonaqueous electrolyte and a cathode including a lithium-containing oxide, the solvent for the nonaqueous electrolyte being a mixed solvent including an aliphatic carboxylate, a cyclic carbonate and a chain carbonate, with the aliphatic carboxylate being represented by the formula  $\text{RCOOR}'$  where R represents an ethyl group and R' represents an alkyl group of 1-3 carbon atoms and the cyclic carbonate being one of ethylene carbonate and propylene carbonate.

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### ELECTROCHEMICAL CELL

Coetzer Johan Transvaal, SOUTH AFRICA assigned to Programme 3 Patent Holdings

A high temperature rechargeable electrochemical power storage cell has an anode compartment and a cathode compartment separated from each other by a separator. The cathode compartment contains a current collector; an alkali metal aluminium halide molten salt electrolyte having the formula  $\text{MAlHal}_4$ ; an alkali metal halide; and a cathode. The cathode comprises an

electrolyte-permeable porous matrix, a first active cathode substance in the matrix in a first zone adjacent the current collector and spaced from the separator, and a second active cathode substance in the matrix in a further zone adjacent the first zone. The first active cathode substance is such that it gives rise to a higher cell potential than does the second active cathode substance. The cell is chargeable at a temperature at which the electrolyte and the alkali metal are molten to cause the active cathode substances to be halogenated.

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### ELECTROCHEMICAL CELL

Coetzer Johan; Vlok Isak L Transvaal, SOUTH AFRICA assigned to Programme 3 Patent Holdings

A high temperature rechargeable electrochemical power storage cell has a molten sodium anode separated by sodium ion-conducting solid electrolyte separator from a solid cathode comprising an electronically conductive electrolyte-permeable porous matrix. The matrix is impregnated with a molten salt electrolyte, and has solid active cathode material dispersed therein. The molten salt electrolyte comprises a substantially equimolar mixture of sodium chloride and aluminium chloride. The active cathode material comprises at least one transition metal selected from the group consisting of Fe, Ni, Cr, Co, Mn, Cu and Mo having, dispersed therein, at least one additive element selected from the group consisting of As, Bi, Sb, Se and Te. The atomic ratio of transition metal:additive element in the active cathode material is 99:1-30:70, the cell having a charged state in which the active cathode material is chlorinated. The invention also provides a method of making such cell.

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### CYLINDRICAL CELL WITH IMPROVED CLOSURE ASSEMBLY

Flack Rober Markham, CANADA assigned to Battery Technologies Inc

PCT No. PCT/CA92/00550 Sec. 371 Date Jun. 16, 1994 Sec. 102(e) Date Jun. 16, 1994 PCT Filed Dec. 21, 1992 PCT Pub. No. WO93/12549 PCT Pub. Date Jun. 24, 1993. An electrochemical cell of cylindrical type,