A fuel cell having a plurality of unit cells stacked in layers, each of the unit cells including an electrolyte and a pair of electrodes, each of the unit cells having a first primary surface and a second primary surface; a plurality of separator elements interposed between the adjacent unit cells, a fuel gas channel being formed on a side of the first primary surface of each of the unit cells and an oxidant gas channel being formed on a side of the second primary surface of each of the unit cells; and manifold portions each of which penetrates the separator elements in a thickness direction and gas-tightly communicates with each of the fuel gas channel and the oxidant gas channel through holes formed in the separator elements. Each of the manifold portions including a plurality of dielectric manifold ring, a plurality of spacer members arranged with the separator elements in a stacking direction and in contact with each other, and a manifold portion fastening mechanism for generating a fastening pressure for pressing the surfaces of the spacer members against surfaces of the associated separator elements. As a result, the surfaces of the spacer members and surfaces of the separator elements are held in mechanical contact with each other by the manifold portion fastening mechanism.

5534362

FUEL CELL STACK AND METHOD OF PRESSING TOGETHER THE SAME

Okamoto Takafumi; Tanaka Manabu; Baba Ichiro; Kato Hideo; Kawagoe Norimasa Wako, JAPAN assigned to Honda Giken Kogyo Kabushiki Kaisha

A fuel cell stack having unit cells and separators, in which each unit cell comprises a solid polymer electrolyte membrane having a pair of electrode catalysts attached on both surfaces, and a pair of collectors, each made of a rigid body, being in contact with respective electrode catalysts, and each of the separators comprises a pair of pressure generating plates defining therebetween a pressure chamber to which a pressurized fluid is introduced, the pressure generating plates being deformed by the pressurized fluid and pressed against the adjacent respective collectors.

BATTERY MATERIALS

5518836

FLEXIBLE CARBON FIBER, CARBON FIBER ELECTRODE AND SECONDARY ENERGY STORAGE DEVICES

McCullough Francis P Lake Jackson, TX, UNITED STATES

A novel flexible carbon fiber is disclosed which has a generally non-circular or tubular cross-sectional shape, a Young's modulus of from greater than 1 MM psi (6.9 GPa) to 55 MM psi (380 GPa), and a bending strain value of from greater than 0.01 to less than 50%. The invention also resides in an electrode for a secondary energy storage device utilizing the carbon fibers of the invention and containing a non-aqueous electrolyte. The invention further resides in a secondary energy storage device comprising a water impermeable housing having at least two cells containing at least one shared bipolar electrode made of the flexible carbon fibers of the invention. Also disclosed is a pseudo bipolar electrode and terminal electrode for use in a lithium ion battery in which the fibers or a portion of the carbon fibers are coated with an ion active lithium salt of a metal oxide. Also disclosed is a novel battery stack and a method of manufacture of the secondary energy storage device.

5518975

SOLID ELECTROLYTE CERAMIC

Van Zyl Arnold; Ray Sikha Ulm, GERMANY assigned to Programme 3 Patent Holdings

A method of making a beta-alumina compound which is a polyaluminate of the general formula MyO*xAl2O3 in which M is a metal selected from monovalent metals and divalent metals, y=2 when M is a monovalent metal, y=1 when M is a divalent metal and x=4-12 comprises forming a green precursor of the 62 -alumina compound by mixing together particulate aluminium metal and a reagent compound comprising an oxide of the metal M or a precursor thereof. The mixture is heated to 800°-1150°C in an oxidizing environment to cause oxidation of at least part of the aluminium. Further heating then takes place to 1150°-1350°C in said