FUEL CELL

5500292

POLYMER ELECTROLYTE HYDROGEN-OXYGEN FUEL CELL WHERE THE POLYMER ELECTROLYTE HAS A WATER REPELLENCY GRADIENT AND A CATALYTICALLY ACTIVE COMPONENT CONCENTRATION GRADIEM ACROSS OXYGEN ELECTRODE

Muranaka Yasushi; Imahashi Jinichi; Horiba Tatsuo; Nishimura Shigeoki Katsuta, JAPAN assigned to Hitachi Ltd

The polymer electrolyte type hydrogen-oxygen fuel cell of the present invention comprises an oxygen electrode and a hydrogen electrode, a polymer electrolyte membrane provided between the oxygen electrode and hydrogen electrode and electron conductors provided on the side of the electrodes which is opposite to the electrolyte side and the oxygen electrode comprises a catalytically active component, a carrier for the catalytically active component and a binder and has such a gradient in water repellency across the thickness that the water repellency is highest in the area adjacent to the electrolyte and lowest in the area adjacent to the conductor. In this fuel cell, flooding of water at the interface between the oxygen electrode and the electrolyte can be prevented.

5500307

SOLID OXIDE FUEL CELL

Anzai Iwao; Matsuoka Shigeki; Uehara Jun Yokohama, JAPAN assigned to Nippon Oil Company; Petroleum Energy Center Foundation

A solid oxide fuel cell, which comprises an assembly of a plurality of unit cells each comprising a solid electrolyte, and a fuel electrode and an air electrode provided on both sides of the solid electrolyte, respectively, the fuel electrode being composed mainly of ruthenium, nickel and ceramics can perform power generation of high efficiency with hydrocarbon or hydrogen resulting from complete reforming of hydrocarbon, or a steam-reformed gas containing carbon monoxide as the main component as a fuel gas.

5501914

SOLID OXIDE ELECTROLYTE FUEL CELL

Satake Tokuki; Nanjo Fusayuki; Watanabe Kiyoshi; Yamamuro Shigeaki Kobe, JAPAN assigned to Mitsubishi Jukogyo Kabushiki Kaisha

A solid oxide electrolyte fuel cell comprises a power generation film consisting of a solid oxide electrolyte film dimpled over substantially the whole area on both sides thereof, an oxygen electrode formed on one side thereof, and a fuel electrode formed on the other side of thereof, and comprises a pair of interconnectors located on both sides of the power generation film. Furthermore, this invention adopts a seal structure for sealing each side of the power generation film to each of the corresponding interconnectors. The peripheral area of the power generation film is provided with a seal face with the interconnector and is formed to lie in essentially the same plane as the apices of the dimpled pattern formed on the power generation film, and the provided seal section has approximately the same thermal expansion coefficient as the solid oxide electrolyte film which forms the power generation film.

5501915

POROUS ELECTRODE FOR ELECTRODE ASSEMBLIES IN A FUEL CELL

Hards Graham A; Ralph Thomas R Wallingford, UNITED KINGDOM assigned to Johnson Matthey Public Limited Company

A porous electrode suitable for use in a membrane electrode assembly for solid polymer fuel cells comprises a highly dispersed precious metal catalyst on particulate carbon impregnated with proton conducting polymer, and, a further component comprising

hydrophobic polymer and a dispersion of particulate carbon, the loading of precious metal being 0.011-1.0 mg/cm2 of geometric electrode area. Said electrode demonstrates high effective platinum surface area and power density output when fabricated into a membrane electrode assembly.

5506066

ULTRA-PASSIVE VARIABLE PRESSURE REGENERATIVE FUEL CELL SYSTEM

Sprouse Kenneth Northridge, CA, UNITED STATES assigned to Rockwell International Corporation

An ultra-passive, variable pressure, regenerative fuel cell system in accordance with the invention utilizes a single gaseous hydrogen storage tank that encloses a plurality of smaller gaseous oxygen storage tubes. This design effectively eliminates the need for active pumping elements to protect the fuel cell's anode surface. A single heating/cooling coil, inside the gaseous hydrogen storage tank, is used to prevent: (a) icing inside the storage tanks due to isentropic expansion during electrical power generation, or (b) overheating of gases due to isentropic compression during electrical recharging operations. Advantageously, the invention also reduces the overall weight and mechanical complexity of the fuel cell system, thereby improving system reliability.

5508127

SOLID OXIDE FUEL CELLS

Lewin Robert G; Wood Geoffrey A Bury, UNITED KINGDOM assigned to British Nuclear Fuels plc

PCT No. PCT/GB93/01199 Sec. 371 Date Jun. 8, 1994 Sec. 102(e) Date Jun. 8, 1994 PCT Filed Jun. 7, 1993 PCT Pub. No. WO93/26055 PCT Pub. Date Dec. 23, 1993. A solid fuel cell for high temperature operation including a refractory solid electrolyte, an anode and a cathode both in intimate contact with the electrolyte and an electronically conducting interconnect medium having pores or channels therethrough permitting oxidant and fuel to be delivered without mixing respectively to the cathode and the anode, wherein the anode, cathode and interconnect medium are provided as zones within a common unitary material, the anode and cathode being present as zones adjacent to different surfaces of the material and the interconnect medium being present as a zone intermediate to the cathode and anode zones.

5508128

FUEL CELL SYSTEM AND FUEL CELLS THEREFOR

Akagi Kosuk Osaka, JAPAN assigned to Osaka Gas Co Ltd

A fuel cell includes an electrolyte layer in form of a plate, an oxygen electrode formed on one surface of the electrolyte layer, a fuel electrode formed on the other surface of the electrolyte layer, and a conductive separator opposed to the oxygen electrode or fuel electrode for defining oxygen-containing gas passages or fuel gas passages. The separator includes a plate-like portion opposed to and spaced from the oxygen electrode or fuel electrode, a pair of strip-shaped projections extending along opposite ends of the plate-like portion for contacting opposite edges of the electrolyte layer, and a plurality of ridges for defining gas passages in form of grooves between the pair of strip-shaped projections. A fuel cell system includes a plurality of such fuel cells stacked one over another in a spaced relationship to define fuel gas passages or oxygen-containing gas passages in between. A flexible conductive element is disposed between an adjacent pair of the fuel cells.

BATTERY MATERIALS

5498403

METHOD FOR PREPARING HIGH DENSITY NICKEL HYDROXIDE USED FOR ALKALI RECHARGEABLE BATTERIES

Shin Dong-Yup Kyunki, REPUBLIC OF KOREA assigned to Hyundai Motor Company