

Discussion on the application of fuel cell

Huangqiang

(ilin Province Changchun second secondary school,Jilin Changchun130061

Abstract: in our time of rapid energy consumption,environmental Pollution Yue YiSevere and resource exhausted,will naturally greet the era of hydrogen energyfull face for society,scientists estimate2030year,fuel PowerPool is a super efficient and rational use of energy and will not pollute the environment allNew technology.today,and social economy rapid development,Microelectronics systemallDevelopment,This is not only the progress of human civilization.,But traditional chemical dynamics has become increasingly unable to meet human energy requirements,Human energy crisismachine,eco-degraded.humans seek efficiency,Clean Alternative Energy has becomeis an important issue.look for high energy density,efficient,weightlight,Low emission,No pollution,Fuel Diverse humans understand thermalpower, nuclear.,Advantages of micro fuel cell,Attract the attention of the world,recentDomestic and international will develop fuel cell as a race.

Keywords: Discussion; application; fuel cell

1. HowFuel cells work

fuel cells are often referred to as a fuelGenerator.usually,when writing the equation for a chemical reaction of a fuel cell,requires a heavyThePoint notes the acid alkalinity of the electrolyte solution.on the positive,negative()raw electrode reactions are generally not single,often with acid of electrolyte solutionalkaline close contact.For example, hydrogen, oxygen, and fuel cells have basic and sour-typeTwo kinds of,Thereaction of the cathode in the acid solution is: $2H_2-4e^-=4H^+$ isExtreme reaction to: $O_2 + 4H^++4e^-=2H_2O$;If in alkalinesolution,No hydrogen ions H^+ ,in an acidic solution,also cannot have hydroxide ion OH^- -appears.Electrolyte solution ifalkali,Salt solution,thenegative reaction equation is: $2H_2+4OH^--4e^-=4H_2O$ positive reaction to: $O_2+2H_2O+4e^-=4OH^-$ If the electrolyte solution is an acidic solution then the negative of the cathodeto the formula: $2H_2-4e^-=4H^+$ (cation),Positive Chemicalreaction to: $O_2+4e^-+4H^+=2H_2O$ The hydrogen-oxygen fuel cell is awith hydrogen H_2 as fuel,Oxygen O_2 as an oxidizer,through the fuel'sBurn chemical reaction,A battery that converts chemical energy directly into electrical energy.hydrogen-oxygen fuel cell at work,Need to supply oxygen to positive electrodes,at the same timesupplies hydrogen to the cathode.Strong effect of catalysts on electrodes,hydrogenand oxygen generate water through electrolytes.This time in the hydrogen(negative)Electrodeshas extra electronicse-with negativecharge,in oxygen(positive)electrodeThe ISpositively charged with missing electrons.After the external circuit is switched on,thisThe combustion-like reaction process provides power to the load circuit..

Working principle diagram of hydrogen and oxygen fuel cell

2. fuel cell features

2.1 High conversion efficiency.compared to other thermal power-generating modes,The theoretical conversion efficiency of fuel cell power generation is higher.

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2.2 High energy or power.

2.3 friendly to environment.fuel cell compared to otherthermal power plantsCan control

environmental pollution to a large extent.

2.4 Good Reliability. a single battery stack into a battery pack constitutes a power generation appliance. All battery pairs are in parallel after the

2.5 Strong Applicability. a wide variety of primary fuels can be used as fuel cell raw materials, can be used as a fuel cell's raw material. Even if the thermal power plant is not suitable for low quality fire, fuel cell not only available power station at a specific location, power generation equipment requires very small footprint, construction requires short duration. The widget portion of the fuel cell power plant is small, All can be blocks, Assembly and manufacturing can be done in the factory, Build The setting takes much less time than previous generation devices.

3. type of fuel cell

3.1 Proton exchange membrane fuel cell. fast-growing life most long, Application widest, start fastest, Lowest temperature, The is the most recent generation fuel cell relay alkaline fuel cell, phosphate fuel cell, dissolve carbonate salt fuel cell, after solid oxide fuel cell is proton exchange membrane fuel cell. but applied fuel cell proton exchange membrane fuel cell actually the first in history to get. A proton concatenated by several single cells. Exchange membrane fuel cell. surface-coated porous anodes with catalysts, multiple holes. A single cell of the cathode and a solid polymer electrolyte placed in the meantime.

3.2 Alkaline fuel cell. cars and submarines are no longer in use. AFC, now AFC mainly used in space shuttle, short ship, used as the main power.

starts at the beginning of the 60 's, We conducted a study of alkaline stone Cotton-Film fuel cell. on 1958 year, CAs (Changchun Applied Chemistry Research Institute * Development of bacon-type fuel cell, This is also the first Research Institute of Bacon-type fuel cell. early in century Year generation first, Dalian Institute of Chemical Physics (CAs) on alkaline asbestos film. The fuel cell has been studied. Research on batteries not only in world Age Year era, on last century, The age also continues, in era, The two types of batteries developed by our country in aerospace.

3.3 Molten carbonate fuel cell. K_2CO_3 and Li_2CO_3 Combined

Introduction to authors: Huangqiang (1990-, Jilin Riverside People, Changchun Second High school physics teacher of Jilin province.

the electrolyte for the molten carbonate fuel cell, working temperature in 1000°C , The electrodes are very fast when electrochemical reactions are occurring, Reminder The agent can be used as a simple metal to act as a works at a higher temperature, can also be reformed coal gasification fuel, Natural gas internal structure.

Construction of the American Energy research company, has been installed in the Gali Sub-merge grid power 2390 MWh molten carbonate fuel cell used internal reorganization of appliance, running 895 h, while in 1997 year 3 months stop Operation, But provided valuable experience for later construction and delivery of the line similar power station.

3.4 Solid oxide fuel cell. solid oxide fuel cell reaction very fast, do not need to use precious metals as catalysts, work temperature of up to 1200°C , Less fuel conversion efficiency non Often high, So you can use these high temperature heat, To promote combustion The total utilization efficiency of the material is increased.

The research work is more prominent in the United States Westinghouse, Development of Demonstration test of solid oxide fuel cell leader now passed, to 1998 Year will start building in the Netherlands KW Exemplary appliance, and Planning for KW to 8 MW construction of power generation devices.

3.5 phosphoric fuel cell (PAFC).

4. Research status at home and abroad

vehicles equipped with hybrid power have been able to provide power to 8 kW, kW, kW Fuel cell is an American energy partner Company Implementation. Two major groups of the world are currently in the production of

automobilesManufacturers,Intense competition around fuel cell technology development.

Experts report,2008Year during the Beijing Olympic Games,595carAll kinds of new energy EV Total Travel371.4million km,passenger441.7Thousands of visitors,where,3fuel cell buses andFuel Powerpool sedan to participate in the full Olympic service.in theMarathon oftheBeijing Olympics and Paralympic Committee,Afuel cell vehicle used as an athlete's vehicle.,succeededComplete Task.after Olympics,fuel cell bus Continue busdemonstration,as China Science and technology department(MOST),UNDP/GEFforCommercial Demonstration project for fuel cell busespart of the,in North

Beijing801Bus runs,until2009Year7month End.

According to Chongqing Times2008Year4MonthDay Report,Chongqing available fromBody Advantage,First universal hydrogen fuel cell car in China."European advancedmaterial forum"in Chongqing,from Europe and ChinaMultiple expertsExploreGlobal New trends,Find Central Europe in new material fieldCooperation Mode.University of London Professor Guo Zhenxiaorevealed, worldScientists in the new material field are focusing on hydrogen fuel cell cars,but findto object to store hydrogen,and place it in car body,always beWorld Class Challenge.current,Magnesium is the ideal hydrogen storage raw material,and ChongqingMagnesium research is world class."Resolve magnesium in releasing hydrogen moleculetemperature problem,is a difficult problem that the Chinese and British sides are overcoming."Guo Zhenxiaosaid,Hydrogen fuel cell vehicles to popularizethe,First to resolve the hydrogen transmission pipeline and the hydrogenation stationBuild Problems,another,How to reduce costs and build hydrogen production base alsotakes time.estimated to2030year,Chongqing available water resources and magnesiumThe advantages of the The Gold Research,Takesthe lead in China to popularize hydrogen fuel cell cars.

5. Summary

for fuel cell vehicles,Although there are many problems nowto be resolved,But these issues are not impossible.,Development BurnMaterial battery cars can achieve great social benefits and great economic effectsBenefits,so,Governments around the world and major carmakers have embarkedon a development of various types of electric vehicles.due to the importance of environmental protection andthe ""Technology Progress,electric cars will likely becomeImportant of the centurytransport.fuel cell car as a small,clean,short-distance andmedium-speed daily workaround convenience tool,in China has its broad application beforeView and unique development conditions.

Although the current cost of fuel cell usage is still high,Utilizationisnot too high.but,with the future shortage of traditional fossil fuels,thePromotion of environmental demandby the stimulus,fuel cell will be in clean electricitysate,Mobile power,submarine and space power supply will have a wide range ofapply foreground,especially proton exchange membrane fuel cells used on vehicles and armour, alcohol fuel cells use directly on small portable products.

(Connectpage)I'm getting to know my kids.,I'm with themSun tomosquito bites,give them plaster stitch pants,But at the same time myStrict requirements and intentions(Hire a gun when training parade)also in themleft a deep imprint on their hearts(later children say).three major exams for periodThe results of my classes are the experimental class fourth,The first of the third and final,as a gift for theArts and Sciences class sendto children,I am gratified!One of the most touching scenes for me is the split shift.before,All the children sang for me."most beautiful sun"this song,andto the podium accept the bows each child gave me,hug and Road Onesound"Thank you, teacher,I love you."Every thought of this scene,i willmoved!

four,Building a harmonious home-school relationship

The head teacher is the school's image,is the school's benchmark,isSchool's duty promoters,Maintain school

reputation, is incumbent on the class teacher. How do we maintain our school reputation? My experience is one class teacher and School remains highly consistent, stand on parents' side to think about problems and solve problem, all from the development for the children, to win parents' reason and thanks, to build a harmonious home-school relationship, to maintain the school's reputation.

Looking back on my homeroom teacher's career, I feel very fulfilling, accompanies me with a Road come with Joy, sad, more continuous thinking, and thinking about it is the ladder where I grew up. The songs My children gave me are always ringing in my voice. 's ear: give me wings, let me fly; give me strength, is you make me strong; not afraid of hurting, because you are next to me, You laugh at your Tears are the most beautiful sun I've dreamed of.... "I want to be the most beautiful sun, shine on my garden fragrance

References

1. Nweke FI, Spencer D, Lynam JK. [] [] [*] Cassava transformation: Africa's best kept secret [M]. the East Lansing: Michigan State University Press, 2002: 221-225.
2. Rao P [] [] JM. Industrial Utilization as sugar CO₂ Products [M]. India: National Federation to CO₂ operatives Ltd, 1997: 274-276.
3. Ma Chongxi. Thoughts on the status of cassava in the biomass industry of Guangxi [J]. Guangxi Tropical Agriculture Industry, 2006 (5): 24-26.
4. Guy CL. Altered gene expression during cold acclimation of spinach [J]. Proc Natl Acad Sci, "[] --", 1985, 82: 3673-3677.
5. Sweetlove LJ, Muller RB, Willmizer L, et al. The contribution of adenosine 5'-diphosphoglucose pyrophosphorylation to the control of starch synthesis in potato tubers [J]. Planta, 1999 (209): 330-337.
6. Pham, Naofumi M. Waxy then high-amylose wheat starches then flours - characteristics, functionality and application. Trends in Food Science & Technology, 2006, 17 (8): 448-456.
7. Li Hongqing, Rimeju, Liu Hong, and so on. Genetic engineering breeding of cassava against leaf premature senescence [J]. Journal of Graduate School of the National Academy of Sciences, 2000, 17 (2): 74-80.
8. Eunkik. Factorial optimization of six cellulose mixture [J]. Biotechnology and Bioengineering, 1998, 58 (5): 496-501.
9. Wang Jianping. Research progress and trends of cellulase [J]. Journal of Zhoushan Teachers College (Natural Science version), 2002 (4): 51-56.

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