1. Anti-aging high resistance solar cell back panel membrane and preparation method thereof

By Wei, Liang

From Faming Zhuanli Shenqing (2017), CN 107331720 A 20171107, Language: Chinese, Database: CAPLUS

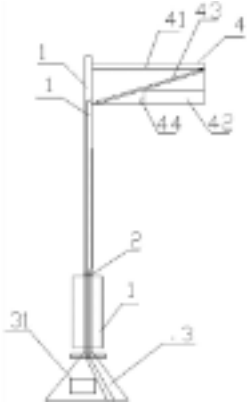
The back panel membrane comprises a moisture barrier membrane and fluorine-contg. membranes arranged on both the inner and outer sides of the moisture barrier membrane, wherein the moisture barrier membrane and the fluorine-contg. membranes are directly laminated and adhered by the corona treatment without any adhesive. The moisture barrier membrane is two-way stretch polyethylene terephthalate. The fluorine-contg. membrane is prepd. from the following raw materials in parts by wt. by radiation polymn.: 20-30 parts of perfluoroalkyl vinyl ether, 10-15 parts of vinyl siloxane modified nano-zinc oxide, 10-15 parts of methacrylic acid, 15-20 parts of vinyl benzotriazole, 10-15 parts of acrylonitrile and 1-2 parts of emulsifying agent. In the process of membrane prepn., the solvent and initiator are not used, which is more environmentally friendly, and the prepn. process has the characteristics of simple manuf. and low cost. The prepd. back panel membrane has excellent anti-aging property and barrier property.

~0 Citings

2. Self cleaning high-efficiency solar street lamp

By Li, Xusheng

From Faming Zhuanli Shenqing (2017), CN 107191876 A 20170922, Language: Chinese, Database: CAPLUS



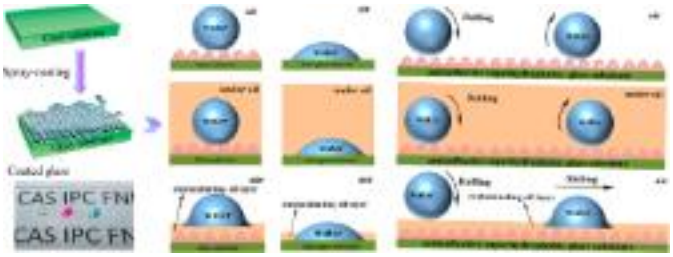
The invention discloses a self cleaning high-efficiency solar street lamp, which comprises the lamp bracket and the lamp post, lamp holder and base from top to bottom, the lamp bracket is fixed on the upper part of the lamp post; the top of the lamp bracket is provided with the water storage tank and the light bulb and light control switch are arranged at the bottom of the lamp bracket; the solar panel is arranged in the lamp bracket and the water storage tank is provided with a set of outlet pipes near the lower side wall of the top of the solar panel; the base is equipped with the battery; the solar panel is connected with the battery and the battery, light control switch, and light bulb are connected in turn; the surface of the solar panel is sequentially provided with a set of the first antireflection coating and the second antireflection coating, transition layer, intermediate efficient self-cleaning layer, and efficient self-cleaning layer. The street lamp can be automatically cleaned, and can reduce the impact force, which avoids damage..

~0 Citings

3. Substrate-Versatile Approach to Robust Antireflective and Superhydrophobic Coatings with Excellent Self-Cleaning Property in Varied Environments

By Ren, Tingting; He, Junhui

From ACS Applied Materials & Interfaces (2017), 9(39), 34367-34376. Language: English, Database: CAPLUS, DOI:10.1021/acsami.7b11116



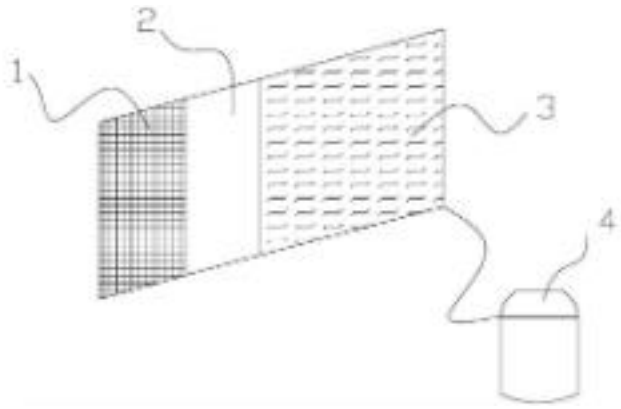
Robust antireflective and superhydrophobic coatings are highly desired in wide applications, such as optical devices, solar cell panels, architectural and automotive glasses, lab-on chip systems, and windows for electronic devices. Meanwhile, simple, low-cost, and substrate-versatile fabrication is also essential toward real applications of such coatings. Herein, we developed a substrate-versatile strategy to fabricate robust antireflective and superhydrophobic coatings with excellent self-cleaning property in varied environments, including air and oil and after oil contamination. A mixed ethanol suspension, which consists of 1H,1H,2H,2H-perfluorooctyltriethoxysilane modified dual-sized silica nanoparticles and acid-catalyzed silica precursor, was first synthesized. The acid-catalyzed silica precursor could help to form a highly cross-linked silica network by connecting the silica nanoparticles, thus significantly enhancing the robustness of coatings. The as-prepd. coatings were able to withstand a water drop impact test, sand abrasion test, tape adhesion test, and knife and pencil scratching tests. More importantly, it was also found that the wettability and self-cleaning property of coatings after oil contamination were surprisingly different from those in air and oil. These observations are explainable by the alteration of interface; i.e., the alteration of interface has significant effects on the functional properties of coatings. Addnl., the mixed suspension could be sprayed onto various hard and soft substrates including glass, polyethylene terephthalate (PET), polycarbonate (PC), and poly(Me methacrylate) (PMMA), opening up a feasible route toward varied practical applications in solar cell panels, optical devices, architectural and automotive glasses, droplet manipulators, and fluid control.

~1 Citing

4. Efficient air condensation water collecting system adopting thermoelectric refrigeration, preparation method of substrate thereof and preparation method of superhydrophobic surface of the substrate

By Wang, Shufen; Jiang, Xuchuan; Yu, Aibing

From Faming Zhuanli Shenqing (2016), CN 106193189 A 20161207, Language: Chinese, Database: CAPLUS



The invention provides an efficient air condensation water collecting system adopting thermoelec. refrigeration, a prepn. method of substrate thereof and a prepn. method of superhydrophobic surface of the substrate. The system comprises a solar panel, a thermoelec. member, a superhydrophobic substrate and a water collecting container, wherein the solar panel is connected with the thermoelec. member to provide the thermoelec. member with working power, the substrate is connected with the cold end of the thermoelec. member, the water collecting container has a U shaped tank body provided with a top fan and a bottom exhaust fan, and the thermoelec. member is arranged on the inner wall of the tank body and has its hot end connected with a metal heat radiator. The superhydrophobic substrate is prepd. by performing ultrasonic cleaning on a polished Cu sheet with acetone, ethanol and water, soaking in soln. contg. NaOH and ammonium persulfate, air blowing, oven drying, soaking in trichlorosilane soln. of n-hexane, air blowing, and oven drying. The invention adopts solar or battery powered thermoelec. refrigeration to reduce dew point temp., and employs a superhydrophobic surface having a nanostructure as water condensation surface to improve water collection efficiency.

~0 Citings

5. Transparent, superhydrophobic, and wear-resistant surfaces using deep reactive ion etching on PDMS substrates

By Ebert, Daniel; Bhushan, Bharat

From Journal of Colloid and Interface Science (2016), 481, 82-90. Language: English, Database: CAPLUS, DOI:10.1016/j.jcis.2016.07.035

Surfaces that simultaneously exhibit superhydrophobicity, low contact angle hysteresis, and high transmission of visible light are of interest for many applications, such as optical devices, solar panels, and self-cleaning windows. Superhydrophobicity could also find use in medical devices where antifouling characteristics are desirable. These applications also typically require mech. wear resistance. The fabrication of such surfaces is challenging due to the competing goals of superhydrophobicity and transmittance in terms of the required degree of surface roughness. In this study, deep reactive ion etching (DRIE) was used to create rough surfaces on PDMS substrates using a O_2/CF_4 plasma. Surfaces then underwent an addnl. treatment with either octafluorocyclobutane (C_4F_8) plasma or vapor deposition of perfluorooctyltrichlorosilane (PFOTCS) following surface activation with O_2 plasma. The effects of surface roughness and the addnl. surface modifications were examd. with respect to the contact angle, contact angle hysteresis, and optical transmittance. To examine wear resistance, a sliding wear expt. was performed using an at. force microscope (AFM).

~2 Citings

6. Cobalt deposition selectivity on copper and dielectrics

By Chen, Philip S. H.; Hunks, William; Lippy, Steven; Lieten, Ruben Remco

From PCT Int. Appl. (2016), WO 2016040077 A1 20160317, Language: English, Database: CAPLUS

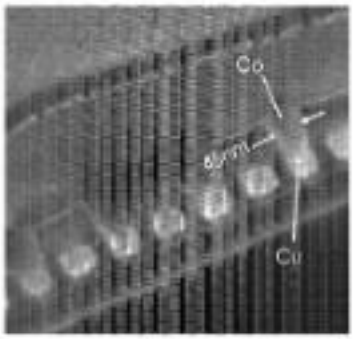


FIG.42

A process for forming cobalt on a substrate, comprising: volatilizing a cobalt precursor of the disclosure, to form, a precursor vapor: and contacting the precursor vapor with the substrate under vapor deposition conditions effective for depositing cobalt on the substrate from the precursor vapor, wherein the vapor deposition conditions include temp. not exceeding 200°C, wherein: the substrate includes copper surface and dielec. material, e.g., ultra-low dielec. material. Such cobalt deposition process can be used to manuf. product articles in which the deposited cobalt forms a capping layer, encapsulating layer, electrode, diffusion layer, or seed for electroplating of metal thereon, e.g., a semiconductor device, flat-panel, display, or solar panel. A cleaning compn. contg. base and oxidizing agent components may be employed to clean the copper prior to deposition of cobalt thereon, to achieve substantially reduced defects in the deposited cobalt.

~0 Citings

7. Polytetrafluoroethylene film for solar battery panel

By Xu, Ming

From Faming Zhuanli Shenqing (2016), CN 105255078 A 20160120, Language: Chinese, Database: CAPLUS

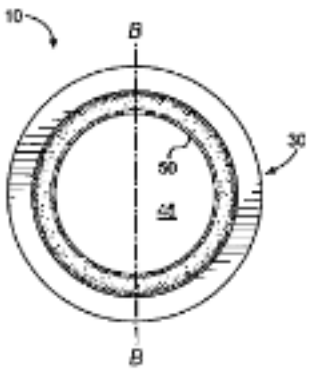
The polytetrafluoroethylene film for solar battery panel is produced by the steps, homogeneously mixing polytetrafluoroethylene powder and a specific compn. of complex solvent, aging at const. temp., mold-pressing, thermally treating at high temp., rapidly cooling, slicing, and performing plasma modification.

~0 Citings

8. Leak-resistant solar panel connector

By Sizelove, J. David

From U.S. Pat. Appl. Publ. (2015), US 20150369401 A1 20151224, Language: English, Database: CAPLUS



A non-reinforced solar panel connector having a tubular shape with a central lumen, a central section of relatively high hardness in relation to terminal sections of relatively low hardness, a length which does not exceed five times its diam., and whose central section includes a projection partially extending into the lumen, with the projection being substantially perpendicular to a longitudinal axis of the connector. The connector is preferably molded from EPDM rubber. The relatively soft terminal sections may be used to easily and reliably join a solar panel to another solar panel and to assocd. piping in fluid-tight relation, while the relatively hard central section ensures the connector does not expand or contract excessively.

~0 Citings

9. Modification of zinc oxide nanoparticles with perfluoro phosphonic acids

By Quinones, Rosalynn; Peck, Cynthia

From Abstracts of Papers, 250th ACS National Meeting & Exposition, Boston, MA, United States, August 16-20, 2015 (2015), COLL-154. Language: English, Database: CAPLUS

Self-Assembled Monolayers (SAMs) were formed on the surface of zinc oxide nanoparticles using different perfluoro phosphonic acids. IR spectroscopy (IR) and Scanning Electron Microscope- Energy-Dispersive X-ray Spectroscopy (SEM-EDX) techniques were used to characterize the surface reaction and det. the degree of surface coverage. Solid-state NMR (SS-NMR) was used to analyze and det. precisely how the acids bind to the ZnO surface. Furthermore, electrochem. anal. were performed to characterize the redox reaction occurring at the interface. A common problem with modification of nanoparticles is the agglomeration effect that nanoparticles can irreversibly undergo that provide non-specific binding to the mol. and not be as ordered as wanted. Solar panels are highly expensive to fix and repair, with this research, repairs on the solar panels will be fewer and more cost effective. There are also ways this could benefit bio anal. Diagnostics, chip-based technologies, and screenings can all take advantage of this research which will allow enhanced and more efficient results.

~0 Citings

10. Vinylidene fluoride copolymer and its preparation method

By Wang, Xianrong; Li, Bin; Yu, Jinlong; Zhang, Tingjian

From PCT Int. Appl. (2015), WO 2015085824 A1 20150618, Language: Chinese, Database: CAPLUS

Provided in the present invention is a vinylidene fluoride copolymer. Same is acquired via a polymn. reaction taking place at

conditions of 30-100 °C and 2-7 MPa with vinylidene fluoride, tetrafluoroethylene, and perfluorinated dioxole or C1-4 alkoxy-substituted perfluorinated dioxole as raw materials, with an initiator added into an emulsion consisting of water, fluorinated emulsifier, a chain transfer agent, a pH regulator, and an antifouling agent, and then via steps of sepn., purifn., refinement, condensation, washing, drying, and granulation, where the molar ratio of vinylidene fluoride, tetrafluoroethylene, and perfluorinated dioxole or C1-4 alkoxy-substituted perfluorinated dioxole is 13-17:2-4:1-3. The vinylidene fluoride copolymer of the present invention provides excellent transparency, flexibility, and soly., is widely applicable in optical app. such as lenses, and is for use in specialty films in the fields of solar panels and of capacitors as a fuel cell membrane, a transparent and tough coating, and a large-sized blown object. The present invention provides a vinylidene fluoride copolymer, prepd. with vinylidene fluoride, tetrafluoroethylene and perfluorinated 1,3-dioxole (or perfluorinated 1,3-dioxole substituted by C_{1-4} alkoxy) as raw materials by the steps of polymg. in emulsion contg. water, fluorine-contg. emulsifier, chain transfer agent, pH modifier and antifouling agent in the presence of initiator at 30-100 ° and 2-7 MPa, then sepg., purifying, refining, condensing, washing, drying and granulating, wherein, the molar ratio of vinylidene fluoride:tetrafluoroethylene:perfluorinated 1,3-dioxole (or perfluorinated 1,3-dioxole substituted by C_{1-4} alkoxy) is 13-17:2-4:1-3. The invented vinylidene fluoride copolymer has excellent transparency, flexibility and soly., and can be widely used in optical devices such as lens, special films in the fields of solar panels and capacitors, fuel cell membrane, transparent tough coating and large-size blowing objects.

~0 Citings

11. Coating combination for solar battery back panel and preparation method thereof

By Huang, Xindong; Liu, Tianren

From Faming Zhuanli Shenqing (2015), CN 104387886 A 20150304, Language: Chinese, Database: CAPLUS

The present invention discloses a coating combination for solar battery back panel and prepn. method thereof. The coating is prepd. from the following starting materials: perfluoro(Et ether) 80-85, Me methacrylate 10-14, dodecafluoroheptyl methacrylate 4-8, titanium isopropoxide 5-9, colloidal silica 13-17, dibenzoyl peroxide 5-9, dibutyltin dilaurate 3-6, alkenoic acid 7-11, leveling agent 3-6, cobalt naphthenate soln. 3-8, zirconia 2-5, 2-propanol 4-8, and citric acid 2-4 wt. parts. The title prepn. method includes the steps of: mixing perfluoro(Et ether), Me methacrylate, dodecafluoroheptyl methacrylate, colloidal silicon dioxide, dibutyltin dilaurate and cobalt naphthenate, stirring and heating to 80-85°C, holding for 1 h, then adding titanium isopropoxide, dibenzoyl peroxide, 2-propanol, alkenoic acid and zirconia, reacting for 2 h, finally adding leveling agent and citric acid, reacting for 3 h, cooling to room temp., and discharging. The coating of the present invention has good weather resistance and water vapor barrier properties, also has good wear resistance and adhesion, and the present invention has simple prodn. process, low prodn. costs, environmental protection, easy transportation and storage, ease of industrial prodn., and has a market value.

~0 Citings

12. Vinylidene fluoride polymer multilayer pressure-sensitive adhesive film

By Bizet, Stephane; Bonnet, Anthony; Devisme, Samuel; Fine, Thomas; Laffargue, Johann

From Fr. Demande (2015), FR 3008418 A1 20150116, Language: French, Database: CAPLUS

Pressure-sensitive adhesive films for protection of backs of solar panels consist of (1) an outer layer of a vinylidene fluoride (I)

homo- or copolymer, (2) a core layer comprising 30-75% I homo- or copolymer, 5-45% methacrylate homo- or copolymer of Me, and 10-30% ≥1 mineral filler, and (3) an outer layer of I homo- or copolymer.

~0 Citings

13. Organic photovoltaic device, method for manufacture thereof and use of fluorine-containing modifiers to enhance organic solar panel performance

By Troshin, P. A.; Susarova, D. K.; Razumov, V. F.

From Russ. (2014), RU 2528416 C2 20140920, Language: Russian, Database: CAPLUS

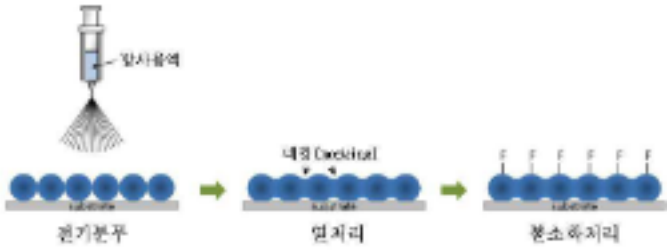
This invention relates to org. electronics and specifically to org. photovoltaic devices (solar panels and photo-detectors) using org. fluorine-contg. compds. as modifying additives. The invention relates to an org. photovoltaic device with a bulk heterojunction, comprising series-arranged substrate, hole-collecting electrode, hole-transporting layer, photo-active layer consisting of a mixt. of an n-type semiconductor material, a p-type semiconductor material and an org. fluorine-contg. compd., an electron-transporting layer, an electron-collecting electrode and a substrate. The photoactive layer further contains a fluorine-contg. modifier F1-F8 in concn. of 0.000000001-40 wt.%. The invention also relates to a method of making a photovoltaic device, where a fluorine-contg. modifier is added to a soln. of semiconductor components, from which photoactive films are formed. The invention also relates to use of fluorine-contg. modifiers F1-F8 to enhance performance of org. solar panels with a bulk heterojunction. Developing novel nano-structure modifying additives for polymer-fullerene systems capable of enhancing performance of photovoltaic devices.

~0 Citings

14. Method for manufacturing superhydrophobic coating layer with excellent adhesion strength by coating with perfluoro alkoxysilane-coated necking ceramic particles

By Kim, Sang Seop; Kim, Ji Yeong; Kim, Jae Hun

From Repub. Korea (2014), KR 1392335 B1 20140512, Language: Korean, Database: CAPLUS



The title method comprises mixing ceramic precursor and solvent to obtain ceramic precursor soln., coating the ceramic precursor soln. on a base material through electrospraying to form a ceramic coating layer, heat-treating the ceramic coating layer to induce necking among particles, and fluorinating the ceramic coating layer. The manufd. superhydrophobic coating layer has given surface roughness, and the adhesion strength is improved. The manufd. superhydrophobic coating layer is suitable for parts such as automobile glass, head lamps and wipers, and can deal with various environmental factors such as rain, snow and fog. When the superhydrophobic coating layer is used in solar cell panels or building outer walls, the

contamination caused by rain or dust can be prevented. Tetra-Et ortho silicate, Me triethoxy silane, tetramethoxy silane, Methyltrimethoxysilane.

~0 Citings

15. Method for manufacture of poly(vinylidene fluoride) resin for back panel film of solar cell

By Wang, Hanli; Li, Xiufen; Tang, Ni; Wang, Jun; Zhang, Peng; Li, Xin

From Faming Zhuanli Shenqing (2014), CN 103755850 A 20140430, Language: Chinese, Database: CAPLUS

The title method includes (1) prepg. a mixt. of water, paraffin wax, and ammonium perfluorooctanoate dispersant in vacuo with O content ≤20 ppm, (2) stirring vinylidene fluoride with the mix. at 60-65°, polymg. in presence of 0.01-1% (based on water content) an initiator at 64.5-66.5° and 2.95-3.15 MPa for 10-20 min, adding more initiator and 0.1-10% (based on total monomers) a mol. wt. modifier at fast rate over 1.5-3.5 h, (3) reacting, and (4) recovering the unreacted monomer and post-processing the product, in which the initiator is tert-amyl peroxy neodecanoate, tert-Bu peroxy neodecanoate, tert-Bu peroxy neoheptanoate or tert-amyl peroxy neovalerate and the mol. wt. modifier is Et propionate, Bu propionate, Bu acetate, or Me acetate.

~0 Citings

16. Vinylidene fluoride copolymer and its preparation method

By Wang, Xianrong; Li, Bin; Yu, Jinlong; Zhang, Tingjian

From Faming Zhuanli Shenqing (2014), CN 103694395 A 20140402, Language: Chinese, Database: CAPLUS

The present invention provides a vinylidene fluoride copolymer, prepd. with vinylidene fluoride, tetrafluoroethylene and perfluorinated 1,3-dioxole (or perfluorinated 1,3-dioxole substituted by C_{1-4} alkoxy) as raw materials by the steps of polymg. in emulsion contg. water, fluorine-contg. emulsifier, chain transfer agent, pH modifier and antifouling agent in the presence of initiator at 30-100 ° and 2-7 MPa, then sepg., purifying, refining, condensing, washing, drying and granulating, wherein, the molar ratio of vinylidene fluoride:tetrafluoroethylene:perfluorinated 1,3-dioxole (or perfluorinated 1,3-dioxole substituted by C_{1-4} alkoxy) is 13-17:2-4:1-3. The invented vinylidene fluoride copolymer has excellent transparency, flexibility and soly., and can be widely used in optical devices such as lens, special films in the fields of solar panels and capacitors, fuel cell membrane, transparent tough coating and large-size blowing objects.

~1 Citing

17. Transparent conductive film, manufacturing method, laminate, coating solution, and use thereof

By Takeda, Hirotaka

From Jpn. Kokai Tokkyo Koho (2013), JP 2013152928 A 20130808, Language: Japanese, Database: CAPLUS

The transparent conductive film contains graphene and sulfonic acid group contg. resins, and optionally, surfactants, and is prepd. by applying a coating soln. on a substrate, followed by drying. A laminate contg. the transparent conductive film on a substrate is suitable for a touch panel, a flat panel display, or a solar cell.

~0 Citings

18. Back panel of solar panel

By Wang, Shouli; Lv, Xinkun; Jiang, Lin; Tan, Haijun

From Faming Zhuanli Shenqing (2013), CN 102945877 A 20130227, Language: Chinese, Database: CAPLUS

The invention provides a back plate of a solar cell and the solar cell. The back plate comprises a weathering-resistant layer, an adhesive layer, a barrier layer, a structure reinforcing layer and an adhesive reflecting layer. The barrier layer comprises an inorg. layer and an org. layer, wherein the inorg. layer is fabricated from inorg. oxides and/or inorg. nitrides; and the org. layer is fabricated from polyethylene naphthalate. The solar cell comprises photovoltaic glass, a first EVA (ethylene-vinyl acetate copolymer) film, a cryst. silicon cell sheet, a second EVA film and the back plate. The back plate has excellent gas barrier property and high anti-aging performance, can effectively prevent moisture and oxygen erosion, and prolong the service life of the solar cell.

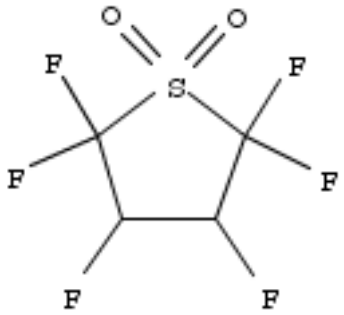
~0 Citings

19. Process for etching using sulfur compounds

By Riva, Marcello; Uenveren, Ercan

From Eur. Pat. Appl. (2013), EP 2540800 A1 20130102, Language: English, Database: CAPLUS

The title S-compd. are certain cyclic fluoro-substituted sulfolenes [1,3,2]-dioxathiepines and sulfolanes [1,3,2]-dioxathiepanes are used as etching gases, esp. for anisotropic etching in the prodn. of etched items, for example, of semiconductors, e.g. semiconductor memories or semiconductor logic circuits, flat panels, or solar cells. Preferred compds. are hexafluoro-3-sulfolene, (Z)-perfluoro-4,7-dihydro-[1,3,2]-dioxathiepine, hexafluoro-3,4-dihydrosulfolane and 4,4,5,6,7,7-hexafluoro-[1,3,2]-dioxathiepane. The compds. have the especial advantage that they allow the direct etching of photoresist-protected items where the pattern of the photoresist is defined by light of a wavelength of 193 nm, or even "extreme UV light". Nodes with a very narrow gap, e.g. nodes with any gap in the range of 130 nm to 7 nm and beyond, for example, nodes with gaps of 130 nm, 90 nm, 45 or 32 nm and even 17 nm and 7 nm, can be produced.



~0 Citings

20. Superhydrophobic substrate with silica nanosphere monolayers for photovoltaic panels

By De Coninck, Joel; Duvivier, Damien; Bourdon, Benoit

From Eur. Pat. Appl. (2013), EP 2540680 A1 20130102, Language: French, Database: CAPLUS

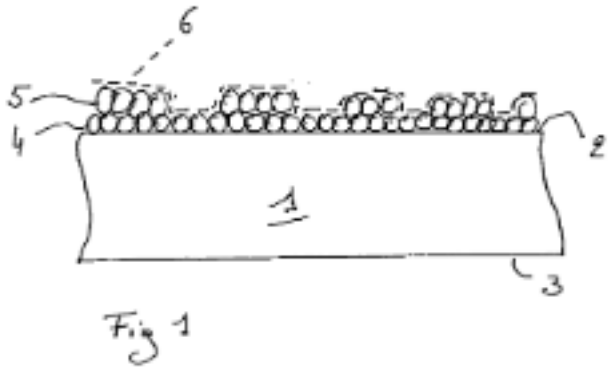


Fig. 1

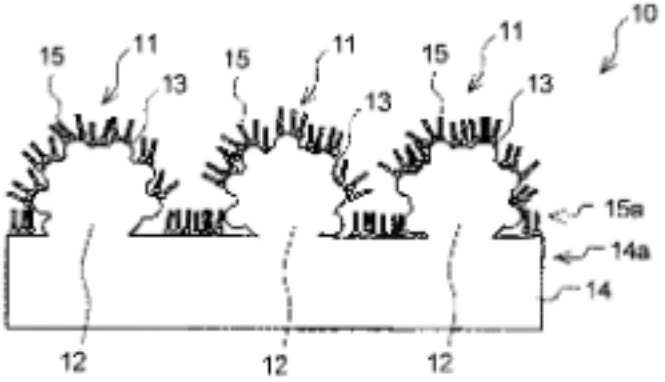
A silicon-contg. support comprises a superhydrophobic external fluorinated coating (such as a fluorosilane or fluorosiloxane) formed of a monolayer of nanospheres of 70-300 nm size deposited on a support layer or a primer layer selected from a primer presenting a Wenzel roughness of 1.02-1.1, or a monolayer of nanospheres having a mean optical granulometry greater than 30 nm, but at least 10 nm lower than that of the nanospheres of the external layer (such as silica).

~1 Citing

21. Highly water and oil repellant light transmitting films with good antifouling effect for glass windows, solar cells, optical devices, and optical imaging displays

By Ogawa, Kazufumi

From Jpn. Kokai Tokkyo Koho (2012), JP 2012219249 A 20121112, Language: Japanese, Database: CAPLUS



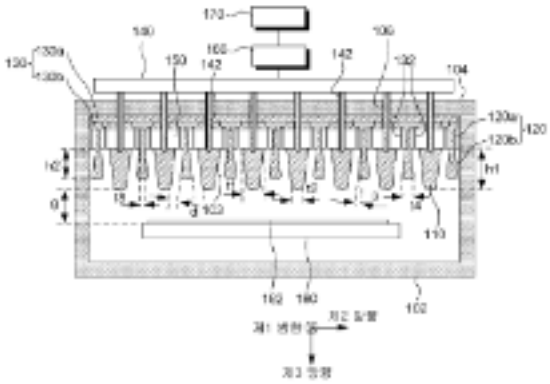
Title films comprise a light transmitting surface layer, composite fine particles comprising spherical or roughly spherical fine particles partially embedded in the surface layer and spherical or semi-spherical finer particles having multiple protrusions whose diams. are smaller than those of the embedded fine particles formed on the fine particles, and a water, oil, and antifouling coating layer formed on the composite finer particles surface. Thus, epoxysilane-treated silica with av. size 130 nm and aminosilane-treated silica with av. size with 15 nm were mixed at 100° for 30 min and 630° for 25 min to give fused composite silica, which were sprayed on a polyester film, heated, and rolled, a coating compn. comprising 2-perfluorooctylethyltrimethoxysilane, dibutyltintin diacetylacetonate was applied on the resulting film to give a test piece.

~1 Citing

22. Plasma generation device used in substrate-processing apparatus

By Jang, Hong Yeong; Seo, Sang Hun; Lee, Yun Seong

From Repub. Korea (2012), KR 1180373 B1 20120910, Language: Korean, Database: CAPLUS



The title plasma generation device includes a plurality of grounding electrodes and a plurality of power supply electrodes. The grounding electrodes are parallel configured in a vacuum container. The power supply electrodes are configured between the grounding electrodes, and incline to a substrate. On one end of each of the above electrodes is formed a curved surface facing the substrate. The power supply electrodes are connected to a radio-frequency power supply.

~0 Citings

23. Vinylidene fluoride copolymer for back-panel film in solar cells

By Miao, Guoxiang; Wang, Xingchuan; Li, Xiaoyu; Chen, Wei

From Faming Zhuanli Shenqing (2012), CN 102585078 A 20120718, Language: Chinese, Database: CAPLUS

Vinylidene fluoride copolymer for solar back-panel film is prepd. by copolymn. of vinylidene fluoride and fluorinated vinyl

monomers, the fluorinated vinyl monomers are selected from tetrafluoroethylene, perfluoroalkyl vinyl ether, vinyl fluoride, chlorotrifluoroethylene or hexafluoropropylene. Thus, deionized water 5600 g, hexafluoropropylene 30 g, HPMC 40 g, magnesium hydroxide 5 g, Et acetate 8 g were mixed in 10 L reactor, then introduced with vinylidene fluoride at 4.0 MPa, polymd. in the presence of diisopropyl peroxycarbonate at 65°, added with more initiators and monomers to give a copolymer showing mp 169°.

~0 Citings

24. Novel ZnO nanowires/silicon hierarchical structures for superhydrophobic, low reflection, and high efficiency solar cells

By Liu, Yan; Lin, Ziyin; Moon, Kyoung Sik; Wong, C. P.

From IEEE Electronic Components and Technology Conference (2011), 61st, 2114-2118. Language: English, Database: CAPLUS

For current solar cell technique, low conversion efficiency is the main limiting factor. A large portion of energy loss during solar cell operation could be attributed to optical loss, namely reflection loss of the incoming light. To reduce the reflection loss, surface texturing and antireflection coatings are most commonly used strategies. We report a novel hierarchical structure of integrating ZnO nanowire arrays on Si micropyramids as an effective anti-reflection layer for improving the energy conversion efficiency. This structure displays a broadband reflection suppression in the 300-1200 nm range, with an av. weighted reflectance of 3.2%, much lower than the previously reported 6.6% reflectance of tapered ZnO nanostructures on planar surfaces. Sunrays 1.3 simulation was employed for optimizing and a better understanding of the effect of hierarchical structure in reflectance suppression. In addn., the surface modification enables a self cleaning property that will prevent the blocking of light by dust particles on solar panels.

~4 Citings

25. Thermal conducting materials for solar panel components

By Xia, Zhiyong; Wohlgemuth, John H.; Cunningham, Daniel W.

From PCT Int. Appl. (2011), WO 2011046787 A1 20110421, Language: English, Database: CAPLUS

This invention relates to solar panels with improved encapsulants and back sheets for greater power output and/or increased efficiency by using materials with higher thermal cond. than conventional solar panels. According to certain embodiments the improved materials include fillers while maintaining sufficient dielec. properties. According to certain other embodiments, the invention includes a solar panel with the improved encapsulant between solar cells and the improved back sheet. The invention also includes a method of making a solar panel including the improved materials. The invention also includes solar modules and methods related to encapsulants and the back sheets including filler materials with an enhanced particle size distribution, a brightening agent, or an IR extinguisher.

~1 Citing

26. Mass production of pristine nano graphene materials

By Zhamu, Aruna; Jang, Bor Z.

From PCT Int. Appl. (2011), WO 2011014347 A1 20110203, Language: English, Database: CAPLUS

The present invention provides a method of producing pristine or nonoxidized nano graphene platelets (NGPs) that are highly conductive. The method comprises: (a) providing a pristine graphitic material comprising at least a graphite crystallite having at least a graphene plane and an edge surface; (b) dispersing multiple particles of the pristine graphitic material in a liq. medium contg. therein no surfactant to produce a suspension, wherein the multiple particles in the liq. have a concn. >0.1 mg/mL and the liq. medium was characterized by having a surface tension that enables wetting of the liq. on a graphene plane exhibiting a contact angle <90°; and (c) exposing the suspension to direct ultrasonication at a sufficient energy or intensity level for a sufficient length of time to produce the NGPs. Pristine NGPs can be used as a conductive additive in transparent electrodes for solar cells or flat panel displays (e.g., to replace expensive In-Sn oxide), battery and supercapacitor electrodes, and nanocomposites for electromagnetic wave interference (EMI) shielding, static charge dissipation, and fuel cell bipolar plate applications.

~2 Citings

27. Mass production of pristine nano graphene materials

By Zhamu, Aruna; Jang, Bor Z.

From U.S. Pat. Appl. Publ. (2011), US 20110017585 A1 20110127, Language: English, Database: CAPLUS

The present invention provides a method of producing pristine or nonoxidized nano graphene platelets (NGPs) that are highly conductive. The method comprises: (a) providing a pristine graphitic material comprising at least a graphite crystallite having at least a graphene plane and an edge surface; (b) dispersing multiple particles of the pristine graphitic material in a liq. medium contg. therein no surfactant to produce a suspension, where the multiple particles in the liq. have a concn. >0.1 mg/mL and the liq. medium is characterized by having a surface tension that enables wetting of the liq. on a graphene plane exhibiting a contact angle <90 degrees; and (c) exposing the suspension to direct ultrasonication at a sufficient energy or intensity level for a sufficient length of time to produce the NGPs. Pristine NGPs can be used as a conductive additive in transparent electrodes for solar cells or flat panel displays (e.g., to replace expensive In-Sn oxide), battery and supercapacitor electrodes, and nanocomposites for electromagnetic wave interference (EMI) shielding, static charge dissipation, and fuel cell bipolar plate applications.

~6 Citings

28. Backboard with envelopment function, and solar cell panel using the same

By Wu, Qiuju; Zhu, Hongjun; Tang, Yanshou; Zhao, Ruofei

From Faming Zhuanli Shenqing (2010), CN 101728437 A 20100609, Language: Chinese, Database: CAPLUS

A backboard is described with envelopment function, and a solar cell panel using the same. The backboard consists of a 1st layer contg. polyfluoroalkylene, a 2nd layer contg. polyester, and a 3rd layer which has a thickness of 200-1000 μm and contains ethylene-vinyl acetate copolymer, polyvinyl butyral, ionomer, polyurethane, silicone, epoxy resin or their mixt. The 3rd layer also contains crosslinking agent, such as 2,5-di-Me hexane-2,5-dihydroperoxide, p-methane hydroperoxide, and/or tert-butylperoxy-2-ethylhexyl carbonate. The 3rd layer also contains antioxidant, UV stabilizer, hydrolysis-resistant agent, flame retardant, pigment, coupling agent, and/or hindered amine stabilizer. The polyfluoroalkylene is polyfluoroethylene, polytetrafluoroethylene, polyperfluoroethylene-propylene copolymer, ethylene-tetrafluoroethylene copolymer, tetrafluoroethylene-hexafluoropropylene-vinylidene fluoride copolymer, etc. The polyester is polyethylene terephthalate, polybutylene terephthalate, polyethylene naphthalate, polytrimethylene terephthalate, or their mixt. The solar cell panel consists of a front board, the above backboard, and a solar cell circuit between the front board and the above backboard.

~2 Citings

29. Thermal conducting materials for solar panel components

By Xia, Zhiyong; Wohlgemuth, John H.; Cunningham, Daniel W.

From U.S. Pat. Appl. Publ. (2010), US 20100043871 A1 20100225, Language: English, Database: CAPLUS

This invention relates to solar panels with improved encapsulants and back sheets for greater power output and/or increased efficiency by using materials with higher thermal cond. than conventional solar panels. According to certain embodiments the improved materials include fillers while maintaining sufficient dielec. properties. According to certain other embodiments, the invention includes a solar panel with the improved encapsulant between solar cells and the improved back sheet. The invention also includes a method of making a solar panel including the improved materials. The invention also includes solar modules and methods related to encapsulants and the back sheets including filler materials with an enhanced particle size distribution, a brightening agent, or an IR extinguisher.

~2 Citings

30. Apparatus for utilization of solar energy

By Iacovella, Alfredo

From Ital. Appl. (2004), IT 2004RM0192 A1 20040719, Language: Italian, Database: CAPLUS

In a solar power plant, solar panels having a large surface are disposed in the center. Water is heated and circulated via conduits to a central reservoir. The latter includes a heat exchanger with coiled tubes through which a heat transfer agent is circulated. The heat transfer agent (e.g., Freon, NH_3, CO_2) enters the heat exchanger in the liq. state. After the heat absorption, the heat transfer agent is withdrawn in the gaseous state and charged in the form of a jet on rotor blades of an elec. generator. After expansion and condensation, the liq. heat transfer agent is recirculated in a closed circuit.

~0 Citings

31. Solar cell module

By Schlipf, Michael; Widmann, Katja

From Ger. Offen. (2008), DE 102007018711 A1 20081023, Language: German, Database: CAPLUS

The aim of the invention is to produce solar cell modules which allow the prodn. cost of solar panels to be reduced. The aim is achieved by a solar cell module comprising several solar cells and a common frame for the same. The frame has a bottom and a top frame part with webs. The solar cells of the module are arranged substantially on a single plane and are disposed at a distance from one another between the top and bottom frame parts. In the mounted state of the module, the webs are located between adjacent solar cells. The frame parts are made of a thermoplastic, fully fluorinated synthetic material and are connected to form an integral joint such that all edges of the solar cells of the module are entirely surrounded in a liq.-tight manner by the frame parts and the webs thereof.

~1 Citing

32. Solar cell module

By Schlipf, Michael; Widmann, Katja

From PCT Int. Appl. (2008), WO 2008125340 A2 20081023, Language: German, Database: CAPLUS

The aim of the invention is to produce solar cell modules which allow the prodn. cost of solar panels to be reduced. The aim is achieved by a solar cell module comprising several solar cells and a common frame for the same. The frame has a bottom and a top frame part with webs. The solar cells of the module are arranged substantially on a single plane and are disposed at a distance from one another between the top and bottom frame parts. In the mounted state of the module, the webs are located between adjacent solar cells. The frame parts are made of a thermoplastic, fully fluorinated synthetic material and are connected to form an integral joint such that all edges of the solar cells of the module are entirely surrounded in a liq.-tight manner by the frame parts and the webs thereof.

~0 Citings

33. Electric connection of electrochemical and photoelectrochemical cells

By Lindquist, Sten-Eric; Hagfeldt, Anders; Lindstrom, Henrik; Sodergren, Sven

From U.S. Pat. Appl. Publ. (2002), US 20020148721 A1 20021017, Language: English, Database: CAPLUS

An electrolytic cell assembly, e.g. for use in solar panels, is formed by placing coated metal wires between the of two conducting glasses, resp. A pressure force is applied to press the metal wires between the conducting layers and to break the coating of the wires, thereby bringing the metal wires in elec. contact with the conducting layers. The coating protects the wires from harmful contact with an electrolyte inside the cell.

~6 Citings

34. Asymmetrical bisbenzotriazoles substituted by a perfluoroalkyl moiety as UV absorbers

By Wood, Mervin; Lau, Jacqueline; Ravichandran, Ramanathan

From U.S. (2001), US 6245915 B1 20010612, Language: English, Database: CAPLUS

Asym. bis benzotriazoles contg. substituent groups, G_2', perfluoroalkyl of 1-12 C atoms, preferably CF_3, and G_2, which does not contain the group are red shifted and due to the asymmetry are particularly sol. and useful in a host of applications including automotive coatings, thermoplastics and esp. in adhesive compns., themselves useful in solar panels and other laminate structures. An example UV absorber methylene-2-[4-tert-butyl-6-(5-phenylsulfonyl-2H-benzotriazol-2-yl)phenol]-2'-[4-tert-octyl-6-(5-trifluoromethyl-2H-benzotriazol-2-yl)phenol] was prepd.

~5 Citings

35. Electric connection of electrochemical and photoelectrochemical cells

By Lindquist, Sten-Eric; Hagfeldt, Anders; Lindstrom, Henrik; Sodergren, Sven

From PCT Int. Appl. (2000), WO 2000042674 A1 20000720, Language: English, Database: CAPLUS

An electrolytic cell assembly, e.g. for use in solar panels, is formed by placing coated metal wires between the conducting layers of two conducting glasses, resp. A pressure force is applied to press the metal wires between the conducting layers and to break the coating of the wires, thereby bringing the metal wires in elec. contact with the conducting layers. The coating protects the wires from harmful contact with an electrolyte inside the cell.

~8 Citings

36. Forming a via through a microelectronics layer susceptible to etching by a fluorine-containing plasma followed by an oxygen-containing plasma

By Yu, Chen-hua

From U.S. (1999), US 5888309 A 19990330, Language: English, Database: CAPLUS

There is 1st provided a substrate employed in fabrication of microelectronic devices, including integrated circuits, solar cells, ceramic substrates, and flat-panel displays. There is then formed over the substrate a microelectronics layer formed of a material susceptible to sequential etching employing a F-contg. plasma followed by an O-contg. plasma. A patterned photoresist layer is then formed on the microelectronics layer. The microelectronics layer is then etched through use of the F-contg. plasma using the patterned photoresist layer as a mask to form a patterned microelectronics layer having a via formed through it. The F-contg. plasma etch method simultaneously forms a fluorocarbon polymer residue layer on a sidewall of the via. The patterned photoresist layer is then stripped through use of the O-contg. plasma from the patterned microelectronics layer while leaving a no

greater than partially etched fluorocarbon polymer residue on the sidewall of the via. Finally, the fluorocarbon polymer residue is stripped from the sidewall of the via through use of a wet chem. stripping method.

~25 Citings

37. Antireflection article

By Aoyama, Takahisa; Shimizu, Tetsuo; Otsuki, Norihito; Nagahama, Norio

From PCT Int. Appl. (1998), WO 9807056 A1 19980219, Language: Japanese, Database: CAPLUS

An antireflection article, comprises an acrylic resin substrate and a fluoropolymer film provided on the surface of the substrate, wherein the film has a thickness of 0.03 to 0.5 μm and the fluoropolymer has a refractive index of 1.30 to 1.40 and contains a block compatible with an acrylic resin and a block of a fluoroelastomer. This article possesses scratch resistance and antireflection effect comparable with the conventional articles and, in addn., can be stably prepd. at a low cost, or possesses an antireflection effect superior to that of the conventional antireflection film while maintaining the scratch resistance.

~9 Citings

38. Substrate-Versatile Approach to Robust Antireflective and Superhydrophobic Coatings with Excellent Self-Cleaning Property in Varied Environments

By Ren Tingting; He Junhui; Ren Tingting

From ACS applied materials & interfaces (2017), 9(39), 34367-34376, Language: English, Database: MEDLINE

Robust antireflective and superhydrophobic coatings are highly desired in wide applications, such as optical devices, solar cell panels, architectural and automotive glasses, lab-on chip systems, and windows for electronic devices. Meanwhile, simple, low-cost, and substrate-versatile fabrication is also essential toward real applications of such coatings. Herein, we developed a substrate-versatile strategy to fabricate robust antireflective and superhydrophobic coatings with excellent self-cleaning property in varied environments, including air and oil and after oil contamination. A mixed ethanol suspension, which consists of 1H,1H,2H,2H-perfluorooctyltriethoxysilane modified dual-sized silica nanoparticles and acid-catalyzed silica precursor, was first synthesized. The acid-catalyzed silica precursor could help to form a highly cross-linked silica network by connecting the silica nanoparticles, thus significantly enhancing the robustness of coatings. The as-prepared coatings were able to withstand a water drop impact test, sand abrasion test, tape adhesion test, and knife and pencil scratching tests. More importantly, it was also found that the wettability and self-cleaning property of coatings after oil contamination were surprisingly different from those in air and oil. These observations are explainable by the alteration of interface; i.e., the alteration of interface has significant effects on the functional properties of coatings. Additionally, the mixed suspension could be sprayed onto various hard and soft substrates including glass, polyethylene terephthalate (PET), polycarbonate (PC), and poly(methyl methacrylate) (PMMA), opening up a feasible route toward varied practical applications in solar cell panels, optical devices, architectural and automotive glasses, droplet manipulators, and fluid control.

~0 Citings

39. Transparent, superhydrophobic, and wear-resistant surfaces using deep reactive ion etching on PDMS substrates

By Ebert Daniel; Bhushan Bharat

From Journal of colloid and interface science (2016), 48182-90, Language: English, Database: MEDLINE

Surfaces that simultaneously exhibit superhydrophobicity, low contact angle hysteresis, and high transmission of visible light are of interest for many applications, such as optical devices, solar panels, and self-cleaning windows. Superhydrophobicity could also find use in medical devices where antifouling characteristics are desirable. These applications also typically require mechanical wear resistance. The fabrication of such surfaces is challenging due to the competing goals of superhydrophobicity and transmittance in terms of the required degree of surface roughness. In this study, deep reactive ion etching (DRIE) was used to create rough surfaces on PDMS substrates using a O2/CF4 plasma. Surfaces then underwent an additional treatment with either octafluorocyclobutane (C4F8) plasma or vapor deposition of perfluorooctyltrichlorosilane (PFOTCS) following surface activation with O2 plasma. The effects of surface roughness and the additional surface modifications were examined with respect to the contact angle, contact angle hysteresis, and optical transmittance. To examine wear resistance, a sliding wear experiment was performed using an atomic force microscope (AFM).

~0 Citings