【CLAIMS】

【Claim 1】

A triboelectric power generating device comprising:

a triboelectric generation layer (300) including a friction portion having a junction structure which is located at a central portion and made of two or more different polymers;

a first electrode (100) which is located to face one surface of the triboelectric generation layer (300); and

a second electrode (200) which is located to face the other surface of the triboelectric generation layer (300), and

wherein the friction portion is formed of junction portions in nanometer unit to micrometer (μm) unit, and

wherein the junction portion have a bulk-heterojunction structure in which two or more different polymers are not uniformly contacted, or have a multi-junction structure.

【Claim 2】

The triboelectric power generating device of claim 1, wherein the polymer is selected from the group consisting of polyamide, polyvinyl alcohol, polymethylmethacrylate, polyester, polyurethane, polyvinyl butyral, polyacrylonitrile, natural rubber, polystyrene, polyvinylidene chloride, polyethylene, polypropylene, polyimide, polyvinylchloride, and polydimethylsiloxane.

【Claim 3】

The triboelectric power generating device of claim 1, wherein the two different polymers are included in the triboelectric generation layer at a weight ratio of 0.1:99.9 to 99.9:0.1.

【Claim 4】

The triboelectric power generating device of claim 1, wherein the first and second electrodes are selected from the group consisting of copper, aluminum, gold, silver, carbon felt, carbon paper, and a composite added with carbon nanotubes (CNT).

【Claim 5】

The triboelectric power generating device of claim 1, wherein in the first and second electrodes, an external exposed surface remaining except for a part facing the

triboelectric generation layer is masked by a tape coated with an adhesive component or an insulating material.

【Claim 6】

The triboelectric power generating device of claim 1, further comprising:

at least on pair of first coating layers (400) which are located on the outer peripheral surface of each of the first and second electrodes (100 and 200); and

at least one pair of second coating layers (500) which are located on the outer peripheral surface of each of the first coating layers (400).

【Claim 7】

The triboelectric power generating device of claim 6, wherein the first coating layer is selected from the group consisting of epoxy, polyester, polyurethane, a mixture of paraffin wax and polyolefin, polyethylene terephthalate, polypropylene, polyethylene, polystyrene, polyvinyl chloride, polyethylene naphthalate, polyamide, polyvinyl alcohol, ethylene vinyl alcohol, polyvinylidene chloride, and mixtures thereof.

【Claim 8】

The triboelectric power generating device of claim 6, wherein the second coating layer (500) is selected from the group consisting of polyimide, polyether ether ketone, mixtures thereof, and mixtures of at least one thereof and compounds constituting the first coating layer (400).

【Claim 9】

The triboelectric power generating device of claim 1, wherein the triboelectric generation layer has a thickness of 1 nm to 10,000 μm.

【Claim 10】

The triboelectric power generating device of claim 1, wherein the first and second electrodes have the thickness of 20 nm to 5 mm.

【Claim 11】

The triboelectric power generating device of claim 6, wherein the first coating layer has the thickness of 100 nm to 10 mm and the second coating layer has the thickness of 1 um to 10 mm.

【Claim 12】

The triboelectric power generating device of claim 1, further comprising:

a first interface layer (600) and a second interface layer (700) which include materials selected from the group consisting of polyamide, polyvinyl alcohol, polymethylmethacrylate, polyester, polyurethane, polyvinyl butyral, polyacrylonitrile, natural rubber, polystyrene, polyvinylidene chloride, polyethylene, polypropylene, polyimide, polyvinylchloride, and polydimethylsiloxane between the triboelectric generation layer and the first electrode, and between the triboelectric generation layer and the second electrode, respectively,

wherein the first interface layer and the second interface layer have different triboelectric polarities.

【Claim 13】

A manufacturing method of a triboelectric power generating device comprising:

a) dissolving and dispersing, or dissolving and dispersing and then mixing, or melting and mixing two or more polymers having different dielectric properties in a solvent, respectively;

b) masking a part of the surface of each of a first electrode and a second electrode having different materials;

c) forming a triboelectric generation layer on the electrode by supplying a polymer solution which is mixed or unmixed in step a) onto a non-masked exposed surface in one of the masked first and second electrodes, and then drying or curing the solution; and

d) laminating and then pressing the other electrode which is not formed with the triboelectric generation layer on the triboelectric generation layer, and

wherein after at least one of steps c) and d) is performed, a process of annealing the triboelectric generation layer is performed.

【Claim 14】

The manufacturing method of the triboelectric power generating device of claim 13, wherein the solvent is selected from the group consisting of linear and cyclic alkane-based compounds, aromatic-based compounds, ketone-based compounds, linear and cyclic ether-based compounds, amine compounds, sulfide-based compounds, and halogen-based compounds.

【Claim 15】

The manufacturing method of the triboelectric power generating device of claim 13, wherein a mixing ratio of each polymer solution is a weight ratio of 0.1:99.9 to 99.9:0.1.

【Claim 16】

The manufacturing method of the triboelectric power generating device of claim 13, further comprising:

e) forming a first coating layer on the outer peripheral surface of each of the first electrode and the second electrode; and

f) forming a second coating layer on the outer peripheral surface of each of the first coating layers.

【Claim 17】

The manufacturing method of the triboelectric power generating device of claim 16, wherein the first coating layer is selected from the group consisting of epoxy, polyester, polyurethane, a mixture of paraffin wax and polyolefin, polyethylene terephthalate, polypropylene, polyethylene, polystyrene, polyvinyl chloride, polyethylene naphthalate, polyamide, polyvinyl alcohol, ethylene vinyl alcohol, polyvinylidene chloride, and mixtures thereof, and the second coating layer is selected from the group consisting of polyimide, polyether ether ketone, mixtures thereof, and mixtures of at least one thereof and compounds constituting the first coating layer.

【Claim 18】

The manufacturing method of the triboelectric power generating device of claim 13, further comprising:

re-supplying the polymer mixed solution used in step c) one time or more onto the surface of the triboelectric generation layer formed in step c) and then drying the solution.

【Claim 19】

The manufacturing method of the triboelectric power generating device of claim 13, wherein a laminated-type triboelectric power generating device is prepared by dissolving and dispersing the polymer in each solvent and then sequentially supplying each polymer solution onto the electrode without mixing.