CLAIMS

1. A method for producing a substrate coated with multi-layer graphenes, comprising laminating, on surface of a substrate, multi-layer graphenes from a mass of multi-layer graphenes,

wherein the mass of multi-layer graphenes is one resulting from aggregation of many multi-layer graphenes without being laminated to each other, and

the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 100nm.

2. The production method of Claim 1, wherein the mass of multi-layer graphenes is an isotropic cluster of multi-layer graphenes composed of aggregates in such a state that multi-layer graphenes extend from the inside toward the outside.

3. The production method of Claim 1 or 2, wherein the multi-layer graphenes constituting the mass of multi-layer graphenes have a thickness of from 0.34 to 10 nm.

4. The production method of Claim 1 to 3, wherein the lamination is carried out by rubbing the surface of the substrate with the mass of multi-layer graphenes.

5. The production method of Claim 1 to 3, wherein the lamination is carried out by bringing the surface of the substrate into contact with a dispersion of multi-layer graphenes prepared from the mass of multi-layer graphenes and then removing a solvent from the surface of the substrate.

6. The production method of Claim 1 to 3, wherein the lamination is carried out by dip-coating of the surface of the

substrate with a dispersion of multi-layer graphenes prepared from the mass of multi-layer graphenes.

7. The production method of Claim 1 to 3, wherein the lamination is carried out by spray-coating of the surface of the substrate with a dispersion of multi-layer graphenes prepared from the mass of multi-layer graphenes.

8. The production method of Claim 5 to 7, wherein the solvent is one selected from the group consisting of 1,2-dichloroethane, benzene, thionyl chloride, acetyl chloride, tetrachloroethylene carbonate, dichloroethylene carbonate, benzoyl fluoride, benzoyl chloride, nitromethane, nitrobenzene, acetic anhydride, phosphorus oxychloride, benzonitrile, selenium oxychloride, acetonitrile, tetramethylsulfone, dioxane, 1,2-propanediol carbonate, benzyl cyanide, ethylene sulfite, isobutyronitrile, propionitrile, dimethyl carbonate, propylene carbonate, ethyl methyl carbonate, diethyl carbonate, ethylene carbonate, phenyl phosphorous acid difluoride, methyl acetate, n-butyronitrile, acetone, ethyl acetate, water, phenyl phosphoric acid dichloride, diethyl ether, tetrahydrofuran, diphenyl phosphoric acid chloride, trimethyl phosphate, tributyl phosphate, dimethylformamide, N-methylpyrrolidine, n-dimethylacetamide, dimethyl sulfoxide, N-diethylformamide, N-diethylacetamide, pyridine, hexamethylphosphoric amide, hexane, carbon tetrachloride, diglyme, trichloromethane, 2-propanol, methanol, ethanol, propanol, ethylene glycol, methyl ethyl ketone, 2-methoxyethanol, dimethylacetamide, toluene and polybenzimidazole, or a mixture of at least two thereof; or

said solvent or solvent mixture comprising a dispersant.

9. The production method of Claim 6 or 8, wherein in the dip-coating, a temperature of the dispersion of multi-layer graphenes is 40°C or more and a lift-up speed when lifting up the substrate dipped in the dispersion of multi-layer graphenes is from 1 to 1000 μm/sec.

10. The production method of Claim 1 to 9, wherein a thickness of the layer of the multi-layer graphenes on the substrate coated with multi-layer graphenes is from 0.5 to 10000 nm.

11. The production method of Claim 1 to 10, wherein the substrate is a resin film made of a resin selected from a polyester resin, an acrylic resin, a polystyrene resin, a polycarbonate resin, a polypropylene resin, a polyethylene resin, a polyvinyl chloride resin and a polytetrafluoroethylene resin; a glass substrate coated on its surface with a resin selected from a polyester resin, an acrylic resin, a polystyrene resin, a polycarbonate resin, a polypropylene resin, a polyethylene resin, a polyvinyl chloride resin and a polytetrafluoroethylene resin or a resin mixture of at least two thereof; a metal foil, metal sheet or metal film made of a metal selected from copper, nickel, iron, aluminum and titanium; paper; a glassy carbon substrate; or a sapphire substrate.

~~12. A graphene-coating tool for coating multi-layer graphenes on surface of a substrate to be processed, said tool has its surface to be brought into contact with the surface of the substrate~~

~~and holds a mass of multi-layer graphenes on its surface.~~

~~13.~~12. A method for producing a substrate coated with multi-layer graphenes, wherein the substrate coated with multi-layer graphenes has a pattern of thick and thin layers of multi-layer graphenes,

said method comprises:

preparing a transfer mold provided, on its surface, with convex and concave portions coinciding with the pattern, overlapping a back surface of the substrate over the surface of the transfer mold, and rubbing on the surface of the substrate multi-layer graphenes from a mass of multi-layer graphenes, wherein the mass of multi-layer graphenes is one resulting from aggregation of many multi-layer graphenes without being laminated to each other, and the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 100nm.

~~14.~~13. A method for producing a substrate coated with multi-layer graphenes, comprising laminating, on surface of a substrate, multi-layer graphenes from a mass of multi-layer graphenes, and then pressing the surface of the substrate,

wherein the mass of multi-layer graphenes is one resulting from aggregation of many multi-layer graphenes without being laminated to each other, and

the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 100nm.

~~15.~~14. The production method of Claim ~~14~~13, wherein the lamination is carried out by spray-coating of the surface of the substrate with a dispersion of multi-layer graphenes, a liquid of pulverized multi-layer graphenes or a dispersion of residual graphenes which are prepared from a mass of multi-layer graphenes.

~~16.~~15. A method for producing a substrate coated with multi-layer graphenes, comprising laminating, on surface of a substrate, multi-layer graphenes from a mass of multi-layer graphenes,

wherein the lamination is carried out by single-fluid spray-coating of the surface of the substrate with a dispersion of multi-layer graphenes, a liquid of pulverized multi-layer graphenes or a dispersion of residual graphenes, which are prepared from a mass of multi-layer graphenes, wherein the mass of multi-layer graphenes is one resulting from aggregation of many multi-layer graphenes without being laminated to each other, and the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 100nm.

~~17.~~16. A substrate coated with multi-layer graphenes, said substrate is produced by laminating, on surface of a substrate, multi-layer graphenes from a mass of multi-layer graphenes, wherein the mass of multi-layer graphenes is one resulting from aggregation of many multi-layer graphenes without being laminated to each other, and the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 100nm.

~~18.~~17. The production method of Claim ~~14~~13, wherein the substrate is a resin film made of a resin selected from a polyester resin, an acrylic resin, a polystyrene resin, a polycarbonate resin, a polypropylene resin, a polyethylene resin, a polyvinyl chloride resin and a polytetrafluoroethylene resin; a glass substrate coated on its surface with a resin selected from a polyester resin, an acrylic resin, a polystyrene resin, a polycarbonate resin, a polypropylene resin, a polyethylene resin, a polyvinyl chloride resin and a polytetrafluoroethylene resin or a resin mixture of at least two thereof; a metal foil, metal sheet or metal film made of a metal selected from copper, nickel, iron, aluminum and titanium; paper; a glassy carbon substrate; or a sapphire substrate.

~~19.~~18. The production method of Claim ~~14~~13 or ~~18~~17, wherein the lamination is carried out by a coating method selected from the group consisting of dip coating, spin coating, die coating spray coating, ink jet printing, printing using a dispenser, flexographic printing (letterpress printing), offset printing (planographic printing), gravure printing (intaglio printing), screen printing, electrophotography, heat transfer, laser transfer, slit coating, bar coating, blade coating, melt extrusion molding method in combination of a resin and an additive, inflation method, T die method, flat die method, solvent casting method, calendaring method, stretching method, multilayer processing method, co-extrusion method, co-extrusion by inflation method, multi-manifold method, laminating method, extrusion-laminating method, laminating method using an adhesive, wet laminating method, dry laminating method, hot-melt laminating method, heat-seal method, external heating method, internal heating method, ion , ion plating, and sputtering.

~~20.~~19. The production method of Claim ~~14~~13, ~~18~~17 or ~~19~~18, wherein the pressing is carried out by a method selected from the group consisting of cold rolling, hot rolling, roll press, hot press, and hot roll press.

~~21.~~20. A substrate coated with multi-layer graphenes, wherein the substrate coated with multi-layer graphenes has a pattern of thick and thin layers of multi-layer graphenes.

21. The production method of Claim 13, wherein the mass of multi-layer graphenes is an isotropic cluster of multi-layer graphenes composed of aggregates in such a state that multi-layer graphenes extend from the inside toward the outside.

22. The production method of Claim 1 or 13, wherein each of the multi-layer graphenes is in a state of being grown, in the direction of the "a" axis of the graphite crystal, approximately vertically to a plane or spherical surface, and the multi-layer graphenes cover the plane surface and the spherical surface to be in a film-like form.

23. The production method of Claim 1 or 13, wherein the multi-layer graphenes are in a state of being grown from the center toward the outside of the fiber in the direction of "a" axis of the graphite crystal, and the multi-layer graphenes are connected to form a fibrous mass, and

the thicknesses of the multi-layer graphenes are in the range of 1nm to 100nm.

24. The production method of Claim 21 or 22, further comprising the step of:

subjecting the cluster of multi-layer graphenes to partial cleaving to form a cluster of cloven multi-layer graphenes, and

the thicknesses of the multi-layer graphenes are in the range of 0.34nm to 9nm.

25. The production method of Claims 13, wherein the pressing step comprises feeding the substrate to a roll press under heating and/or a hot press, wherein,

the heating temperature of the roll press is 70°C to 300°C,

the press load of the roll press is 1 N to 100000 N,

the feeding speed to the roll press is 0.1 cm/sec to 10 cm/sec,

the heating temperature of the hot press is 70°C to 300°C,

the press load of the hot press is 1 N to 5000000 N, and

the pressing time of the hot press is 10 sec to 10 min.