CLAIMS

1. A semiconductor substrate comprising:

a substrate that includes a graphite layer, the graphite layer forming a surface of the substrate, and being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine; and

a semiconductor layer that is grown on a surface of the graphite layer.

2. A semiconductor substrate comprising:

a substrate that includes a graphite layer, the graphite layer forming a surface of the substrate, and being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine;

a buffer layer that is grown on a surface of the graphite layer; and

a semiconductor layer that is grown on a surface of the buffer layer.

3. The semiconductor substrate according to claim 2, wherein the buffer layer includes at least one of HfN, ZrN, and AlN.

4. The semiconductor substrate according to claim 2 or 3, wherein the buffer layer includes a plurality of layers.

5. The semiconductor substrate according to any one of claims 1 to 4, wherein the semiconductor layer is formed of a semiconductor that includes silicon or a group 13 nitride.

6. The semiconductor substrate according to any one of claims 1 to 5, wherein the graphite layer has a (0001) surface, and the semiconductor layer is grown on the (0001)

surface.

7. The semiconductor substrate according to any one of claims 1 to 6, wherein the substrate includes a base that includes an organic compound that differs from the heterocyclic polymer, and the graphite layer that is provided on the base.

8. A method of producing a semiconductor substrate comprising causing a semiconductor layer to grow on a surface of a graphite layer that forms a surface of a substrate, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine.

9. A method of producing a semiconductor substrate comprising causing a buffer layer to grow on a surface of a graphite layer that forms a surface of a substrate, and causing a semiconductor layer to grow on a surface of the buffer layer, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine.

10. The method according to claim 9, comprising causing a layer that includes at least one of HfN, ZrN, and AlN to grow as the buffer layer.

11. The method according to claim 9 or 10, comprising forming a plurality of layers as the buffer layer.

12. The method according to any one of claims 8 to 11, comprising causing a semiconductor layer that includes silicon or a group 13 nitride to grow as the semiconductor layer.

13. The method according to any one of claims 8 to 12, wherein the graphite layer has a (0001) surface, and the method comprises causing the semiconductor layer to grow on the (0001) surface.

14. The method according to any one of claims 8 to 13, comprising forming the graphite layer on a base that is formed of an organic compound that differs from the heterocyclic polymer to obtain the substrate.

15. The method according to claim 14, comprising dissolving the heterocyclic polymer in a solvent to obtain a solution of the heterocyclic polymer, applying the solution to the base to form a thin film, and heating the thin film and the base at 2000 to 3000°C to obtain the substrate.

16. The method according to any one of claims 8 to 13, comprising forming a layer of the heterocyclic polymer on a free-standing base, and separating the layer of the heterocyclic polymer from the free-standing base to obtain the graphite layer.

17. The method according to any one of claims 8 to 16, comprising forming the graphite layer so that the graphite layer has a coefficient of thermal expansion corresponding to a coefficient of thermal expansion of the layer that is grown on the surface of the graphite layer.

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18. A semiconductor growth substrate comprising a graphite layer that forms a surface of the semiconductor growth substrate, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine.

19. The semiconductor growth substrate according to claim 18, wherein the graphite layer has a (0001) surface.

20. The semiconductor growth substrate according to claim 18 or 19, comprising forming a base that is formed of an organic compound that differs from the heterocyclic polymer, the graphite layer being formed on the base.

21. A method of producing a semiconductor growth substrate comprising forming a graphite layer on a base, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine, and the base being formed of an organic compound that differs from the heterocyclic polymer.

22. The method according to claim 21, comprising dissolving the heterocyclic polymer in a solvent to obtain a solution of the heterocyclic polymer, applying the solution to the base to form a thin film, and heating the thin film and the base at 2000 to 3000°C to obtain the semiconductor growth substrate.

23. A method of producing a semiconductor growth substrate comprising forming a layer of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine on a free-standing base, and separating the layer of the heterocyclic polymer from the free-standing base to obtain a graphite layer.

24. The method according to any one of claims 21 to 23, comprising forming the graphite layer so that the graphite layer has a coefficient of thermal expansion corresponding to a coefficient of thermal expansion of a layer that is grown on a surface of the graphite layer.

25. A semiconductor device comprising the semiconductor substrate according to any one of claims 1 to 7.

26. A light-emitting device comprising the semiconductor device according to claim 25.

27. A display panel comprising the light-emitting device according to claim 26.

28. An electronic device comprising the semiconductor device according to claim 25.

29. A solar cell device comprising the semiconductor substrate according to any one of claims 1 to 7.

30. An electronic instrument comprising at least one of the semiconductor device according to claim 25, the light-emitting device according to claim 26, the display panel according to claim 27, the electronic device according to claim 28, and the solar cell device according to claim 29.

CLAIMS

1. A method of producing a semiconductor substrate comprising causing a semiconductor layer to grow on surface of a graphite layer that forms a surface of a substrate, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetramine, wherein the method further comprises forming the graphite layer so that the graphite layer has a coefficient of thermal expansion corresponding to a coefficient of thermal expansion of the layer that is grown on the surface of the graphite layer.

2. A method of producing a semiconductor growth substrate comprising forming a graphite layer on a base, the graphite layer being formed of a heterocyclic polymer obtained by condensing an aromatic tetracarboxylic acid and an aromatic tetraamine, and the base being formed of an organic compound that differs from the heterocyclic polymer, wherein the method further comprises forming the graphite layer so that the graphite layer has a coefficient of thermal expansion corresponding to a coefficient of thermal expansion of a layer that is grown on a surface of the graphite layer.