CLAIMS

What is claimed is:

1. A film comprising a substrate and an adhesive layer provided on one surface of the substrate, characterized in that

the storage elastic modulus at 180° C. of the substrate is from 10 to 100 MPa,

the adhesive layer is a reaction cured product of a composition for adhesive layer comprising an acrylic polymer having hydroxy groups, and a polyfunctional isocyanate compound,

the total equivalent amount of hydroxy groups and carboxy groups in the acrylic polymer is at most 2,000 g/mol,

in the composition for adhesive layer, $M_{COOH}/(M_{NCO}-M_{OH})$ is from 0 to 1.0, and $M_{NCO}/(M_{COOH}+M_{OH})$ is from 0.4 to 3.5 (wherein M_{OH} is the number of moles M_{OH} of hydroxy groups derived from the acrylic polymer, M_{COOH} is the number of moles of carboxy groups derived from the acrylic polymer, and M_{NCO} is the number of moles of isocyanate groups derived from the polyfunctional isocyanate compound).

2. The film according to claim 1, wherein the mass average molecular weight of the acrylic polymer is from 100,000 to 1,200,000.

3. The film according to claim 1, wherein the polyfunctional isocyanate compound has an isocyanurate ring.

4. The film according to claim 1, wherein the storage elastic modulus at 180° C. of the adhesive layer is from 2 to 20 MPa.

5. The film according to claim 1, wherein the insolubility degree of the adhesive layer obtainable by the following formula from the basis weight W1 (g/m^2) of the adhesive layer and

the basis weight W2 (g/m^2) of the adhesive layer remaining after subjecting the film to the following dissolution test, is from 40 to 90%:

Insolubility Degree (%)=(*W*2/*W*1)×100

<Dissolution Test>

The film is immersed in methylene chloride at from 20 to 25° C. and stirred for one day; the film after completion of the stirring for one day is immersed and washed for 10 minutes in another methylene chloride at from 20 to 25° C.; and the film after the washing is vacuum-dried at 100° C. for two hours.

6. The film according to claim 1, wherein the substrate contains an ethylene-tetrafluoroethylene copolymer.

7. The film according to claim 1, wherein the thickness of the substrate is from 50 to 100 μm, and the thickness of the adhesive layer is from 0.5 to 15 μm.

8. The film according to claim 1, wherein the composition for adhesive layer further contains an antistatic agent.

9. The film according to claim 1, which has an antistatic layer between the substrate and the adhesive layer.

10. The film according to claim 1, which is a mold release film to be used in a sealing process for producing a semiconductor element sealed with a sealing resin.

11. The film according to claim 10, wherein the semiconductor element sealed with a sealing resin, is a semiconductor element having a part of the surface of a semiconductor chip, a source electrode or a sealing glass exposed from the sealing resin.

12. The film according to claim 10, which is a mold release film to be used so that when the curable resin is cured and formed into the sealing resin in a mold in the sealing process, the

substrate-side surface of the mold release film is in contact with the mold inner surface, and the surface of the adhesive layer of the mold release film is in contact with a part of the surface of a semiconductor chip.

13. The film according to claim 1, which is a mold release film to be used in the following sealing process:

Sealing process: A sealing process comprising a step of disposing the mold release film on the surface of a mold to be in contact with a curable resin so that its substrate side surface is in contact with the mold surface, and disposing, in the mold, a structure having a semiconductor chip, and having a source electrode or a sealing glass,

a step of clamping the mold so that the mold is, via the mold release film, in contact with the surface of the semiconductor chip, the source electrode or the sealing glass,

a step of filling and curing the curable resin in the mold while clamping the mold, to form a resin sealed portion, thereby to obtain a sealed body having said structure and said resin sealed portion and having a part of the surface of the semiconductor chip, source electrode or sealing glass exposed, and

a step of releasing the sealed body from the mold.

14. A method for producing the film as defined in claim 1, characterized by comprising a step of forming the adhesive layer by applying and drying a coating liquid for adhesive layer comprising the composition for adhesive layer and a liquid medium on one surface of a substrate.

15. A method for producing a semiconductor element having a semiconductor chip and a resin sealed portion, and having a source electrode or a sealing glass, and having a part of the surface of the semiconductor chip, source electrode or sealing glass exposed, characterized by comprising

a step of disposing the film as defined in claim 1 on the surface of a mold to be in contact with a curable resin, so that its substrate side surface is in contact with the mold surface, and disposing, in the mold, a structure having a semiconductor chip and having the source electrode or the sealing glass,

a step of clamping the mold, so that the mold is, via the mold release film, in contact with the surface of the semiconductor chip, electrode or sealing glass,

a step of filling and curing the curable resin in the mold, while clamping the mold, to form the resin sealed portion, thereby to obtain a sealed body having said structure and said resin sealed portion, and having a part of the surface of the semiconductor chip, source electrode or sealing glass exposed, and

a step of releasing the sealed body from the mold.