CLAIMS

Claim 1.

A mold release film to be disposed on a surface of a mold which is to be in contact with a curable resin, in the production of a semiconductor package by disposing a semiconductor element in the mold, and sealing it with the curable resin to form a resin sealed portion, characterized by comprising

a resin-side release layer to be in contact with the curable resin at the time of forming the resin sealed portion, and a gas barrier layer, wherein

the gas barrier layer comprises at least one polymer (I) selected from the group consisting of a polymer having vinyl alcohol units and a polymer having vinylidene chloride units, and

the thickness of the gas barrier layer is from 0.1 to 5 μm,

wherein the polymer (I) contains the polymer having vinyl alcohol units,

the polymer having vinyl alcohol units, has a crosslinked structure, and

the insolubility degree of the gas barrier layer obtainable by the following formula from the basis weight W1 (g/m^2) of the gas barrier layer and the basis weight W2 (g/m^2) of the gas barrier layer remaining after subjecting the mold release film to the following dissolution test, is from 10 to 80%:

Insolubility degree (%) = (W2/W1) × 100

(Dissolution test)

the mold release film is heated for 1 hour by immersing it in ion-exchanged water of 80°C, during which stirring for 1 minute is repeated at 30 minutes intervals; the mold release film after completion of the heating for 1 hour, is washed by immersing it in another ion-exchanged water of 80°C for 10 minutes; the mold release film after the washing, is immersed in ion-exchanged water of from 20 to 25°C for 10 minutes to carry out washing and cooling; and the mold release film after the washing and cooling, is vacuum-dried at 100°C for 2 hours.

Claim 2.

The mold release film according to Claim 1, wherein the polymer having vinyl alcohol units is a polyvinyl alcohol, or a polymer comprising vinyl alcohol units and vinyl

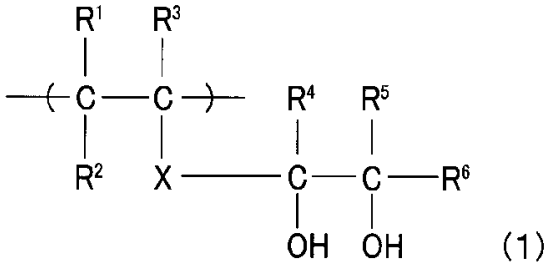
acetate units.

Claim 3.

The mold release film according to Claim 2, wherein the polymer having vinyl alcohol units is a polymer which further contains units other than vinyl alcohol units and vinyl acetate units.

Claim 4.

The mold release film according to Claim 3, wherein the units other than vinyl alcohol units and vinyl acetate units, are units represented by the following formula (1):



(1)

wherein R^1 to R^6 are each independently a hydrogen atom or a monovalent organic group, and X is a single bond or a bonding chain.

Claim 5.

The mold release film according to any one of Claims 1 to 4, wherein the thickness of the resin-side release layer is from 12 to 100 μm.

Claim 6.

The mold release film according to any one of Claims 1 to 5, wherein the resin side release layer contains a fluororesin.

Claim 7.

The mold release film according to Claim 6, wherein the fluororesin is an ethylene-tetrafluoroethylene copolymer.

Claim 8.

The mold release film according to any one of Claims 1 to 7, wherein the mold release film is a film having a two-layer structure of the resin-side release layer and the gas barrier layer.

Claim 9.

A process for producing the mold release film as defined in any one of Claims 1 to 8, characterized by comprising a step of forming the gas barrier layer on one surface of a substrate containing a resin-side release layer, wherein

the step of forming a gas barrier layer includes a step of forming a coating film by applying a gas barrier layer-forming coating liquid comprising at least one polymer (II) selected from the group consisting of a polymer having vinyl alcohol units and a polymer having vinylidene chloride units, a liquid medium and a crosslinking agent, followed by drying,

the polymer (II) contains the polymer having vinyl alcohol units, and

the step of forming a gas barrier layer further includes, after the step of forming a coating film, a step of forming a cross-linked structure by crosslinking the polymer (II).

Claim 10.

The process for producing the mold release film according to Claims 9, wherein the content of the crosslinking agent is from 1 to 50 mass% to the polymer (II).

Claim 11.

The process for producing the mold release film according to Claim 9 or 10, wherein the liquid medium is an aqueous medium.

Claim 12.

A process for producing a semiconductor package having a semiconductor element and a resin sealed portion formed from a curable resin to seal the semiconductor element, characterized by comprising

a step of disposing the mold release film as defined in any one of Claims 1 to 8, on a surface of a mold which is to be in contact with a curable resin,

a step of disposing a substrate having a semiconductor element mounted thereon, in the mold, and filling a curable resin in a space in said mold, followed by curing to form a resin sealed portion, thereby to obtain a sealed body having the substrate, the semiconductor element and the resin sealed portion, and

a step of releasing the sealed body from the mold.