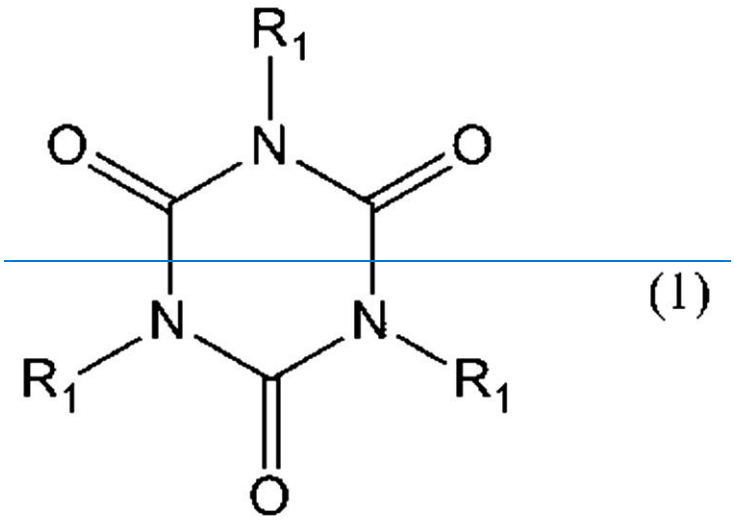
CLAIMS

1. A negative-acting photosensitive resin composition comprising:

(A) a compound having a triazine ring represented by the following formula (1):



(1)

wherein R_1s each independently represent an organic group, with the proviso that at least one R_1 represents an organic group having a glycidyl group or an organic group having an oxetanyl group;

(B) an epoxy resin having a benzene backbone and at least two epoxy groups in one molecule and having an epoxy equivalent weight of 500 g/eq or less; and

(C) a cationic photopolymerization initiator,

the negative-acting photosensitive resin composition being configured such that

the content of the compound (A) represented by formula (1) relative to the epoxy resin (B) is 1 to 50 mass%, and

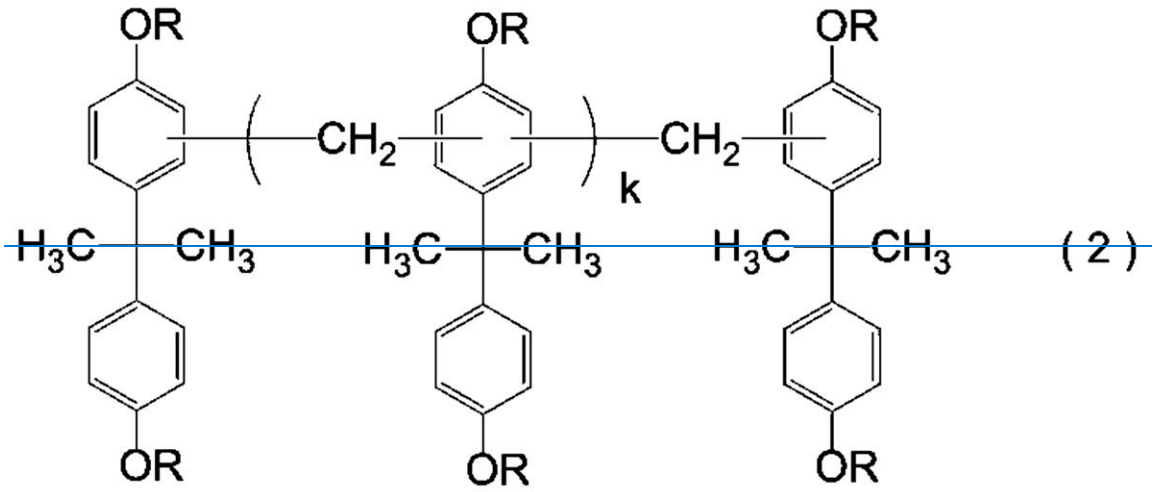
the epoxy resin (B) satisfies at least one of the following conditions (i) and (ii):

condition (i): having a weight-average molecular weight of 500 or more; and

condition (ii): having a softening point of 40°C or more; and

wherein the epoxy resin (B) having a benzene backbone and at least two epoxy groups in one molecule and having an epoxy equivalent weight of 500 g/eq or less is at least one member selected from the group consisting of:

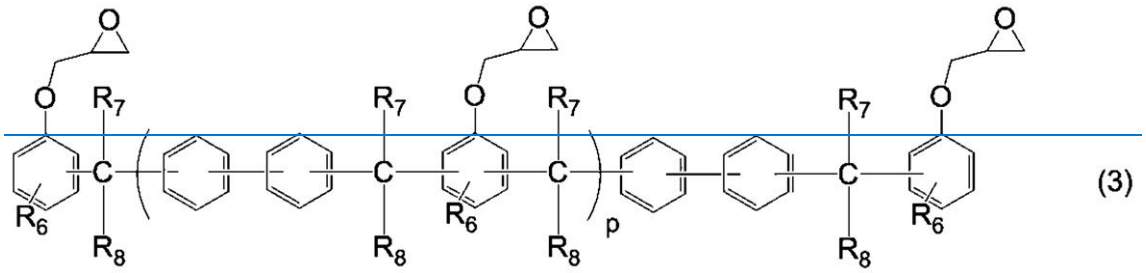
an epoxy resin (B-1) represented by the following formula (2):



(2)

wherein Rs each independently represent a glycidyl group or a hydrogen atom, with the proviso that at least two Rs are glycidyl groups, and k represents an average and is a real number within a range of 0 to 30,

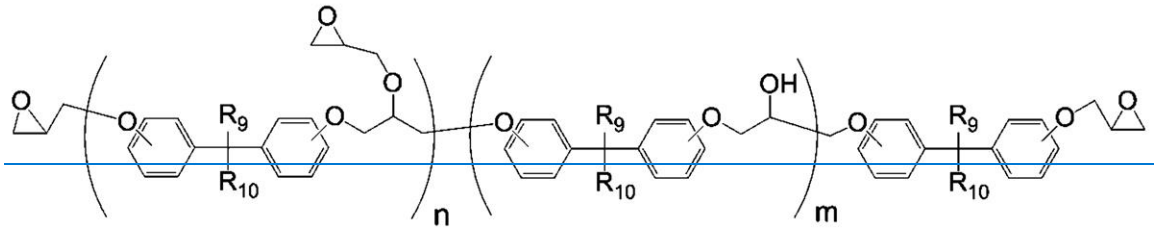
an epoxy resin (B-2) represented by the following formula (3):



(3)

wherein R_6, R_7, and R_8 each independently represent a hydrogen atom or a C_{1-4} alkyl group, and p represents an average and is a real number within a range of 1 to 30,

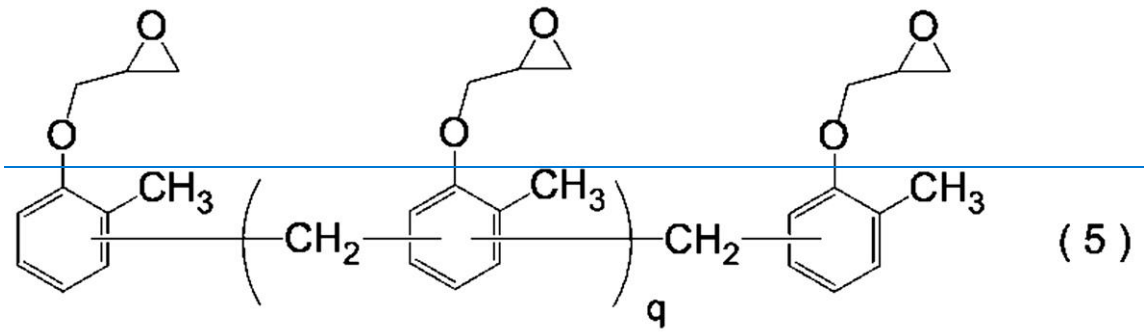
an epoxy resin (B-3) represented by the following formula (4):



(4)

wherein n and m each represent an average, n is a real number within a range of 1 to 30, m is a real number within a range of 0.1 to 30, and R_9 and R_{10} each independently represent a hydrogen atom, a C_{1-4} alkyl group, or a trifluoromethyl group,

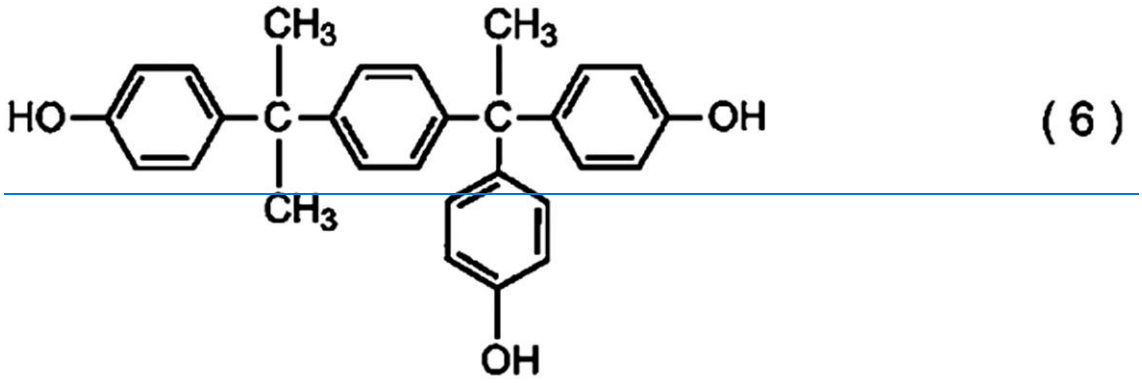
an epoxy resin (B-4) represented by the following formula (5):



(5)

wherein q represents an average and is a real number within a range of 1 to 30,

an epoxy resin (B-5) that is a reaction product between a phenol derivative represented by the following formula (6):

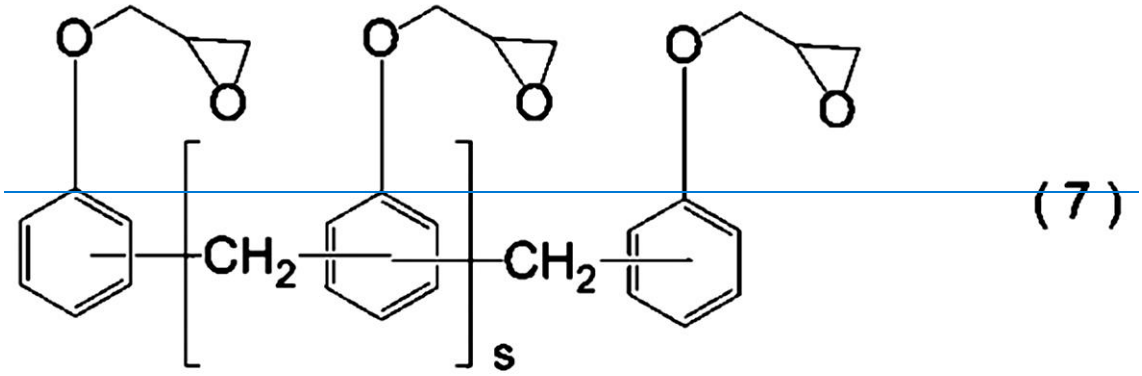


(6)

and an epihalohydrin,

an epoxy resin (B-6) obtained by allowing a polybasic acid anhydride to react with a reaction product between an epoxy compound having at least two epoxy groups in one molecule and a compound having at least one hydroxyl group and one carboxyl group in one molecule,

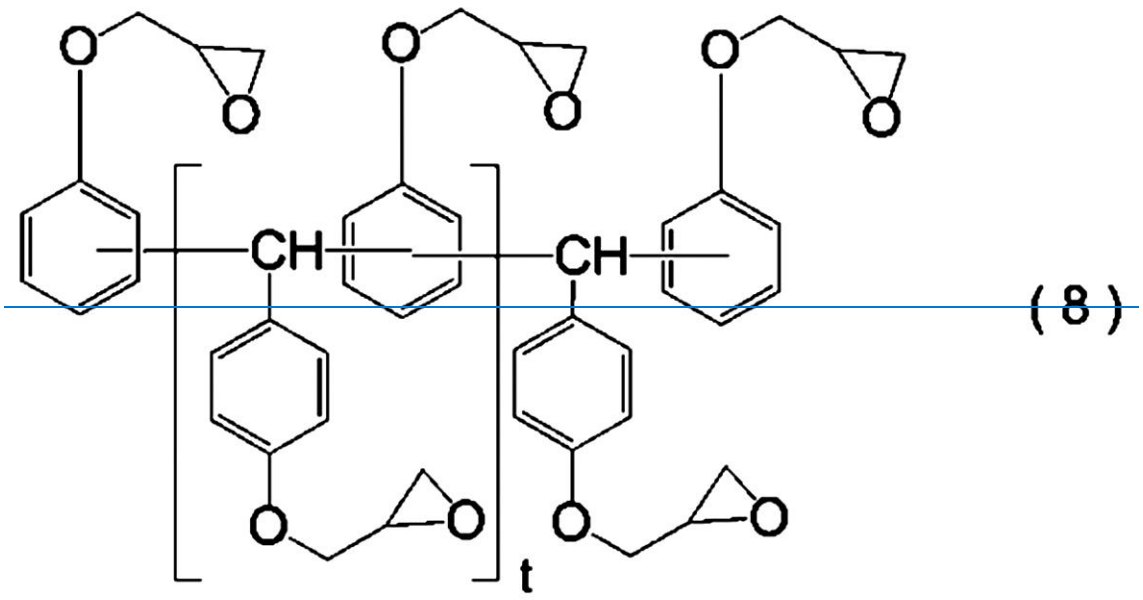
an epoxy resin (B-7) represented by the following formula (7):



(7)

wherein s represents an average and is a real number within a range of 1 to 10,

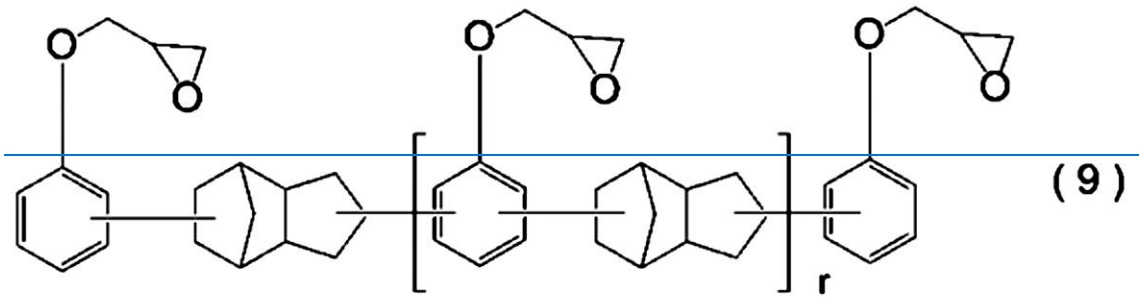
an epoxy resin (B-8) represented by the following formula (8):



(8)

wherein t represents an average and is a real number within a range of 0.1 to 5, and

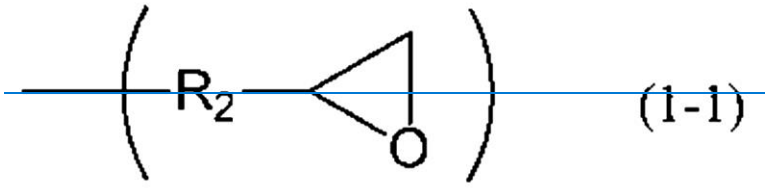
an epoxy resin (B-9) represented by the following formula (9):



(9)

wherein r represents an average and is a real number within a range of 0.1 to 6.

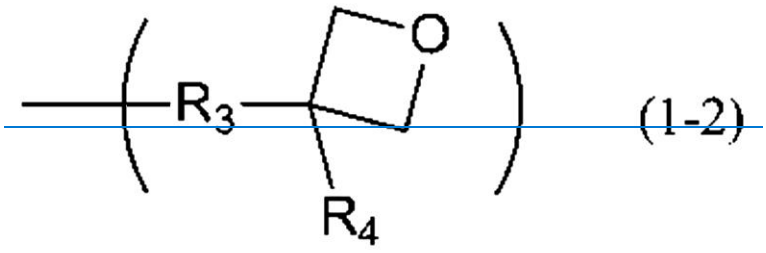
2. The negative-acting photosensitive resin composition according to claim 1, wherein at least one R_1 is an organic group represented by the following formula (1-1):



(1-1)

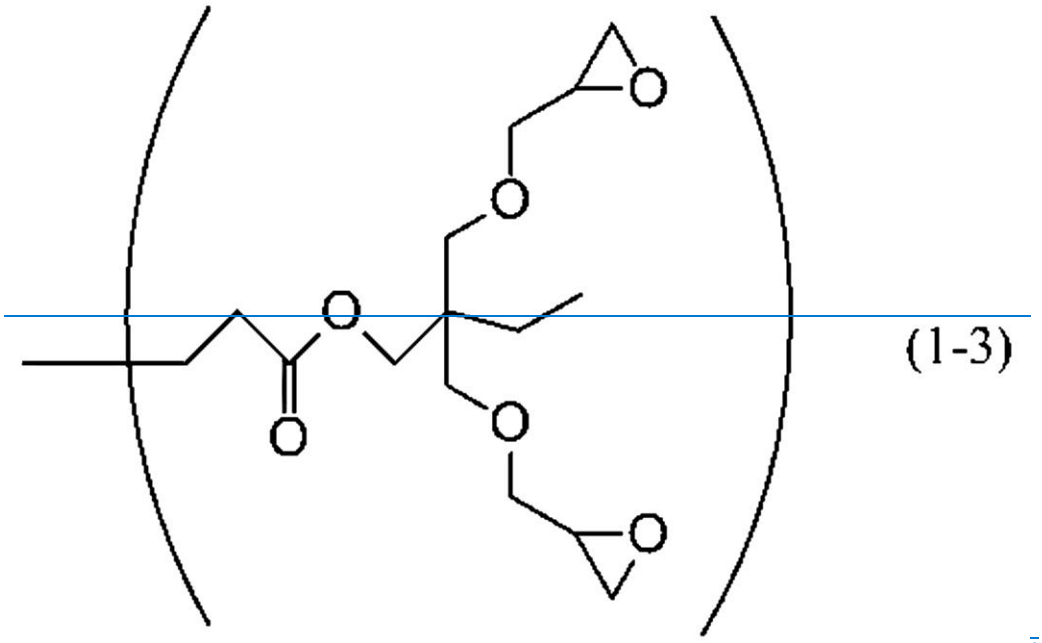
wherein R_2 represents a C_{1-8} alkylene group,

the following formula (1-2):



(1-2)

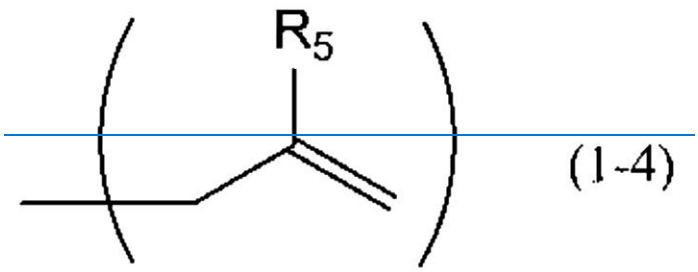
wherein R_3 represents a C_{1-8} alkylene group, and R_4 represents a C_{1-6} alkyl group, or the following formula (1-3):



(1-3)

3. The negative-acting photosensitive resin composition according to claim 2, wherein any of R_1s is an organic group represented by formula (1-1), an organic group represented by formula (1-2), or an organic group represented by formula (1-3).

4. The negative-acting photosensitive resin composition according to claim 2, wherein at least one R_1 is an organic group represented by the following formula (1-4):



(1-4)

wherein R_5 represents a hydrogen atom or a methyl group.

~~5. A dry film resist comprising the negative-acting photosensitive resin composition according to any one of claims 1 to 4.~~

~~6. A cured product of the negative-acting photosensitive resin composition according to any one of claims 1 to 4 or the dry film resist according to claim 5.~~

~~7. A wafer level package comprising the cured product according to claim 6.~~

~~8. An adhesive layer between a substrate and an adherend, comprising the cured product according to claim 6.~~

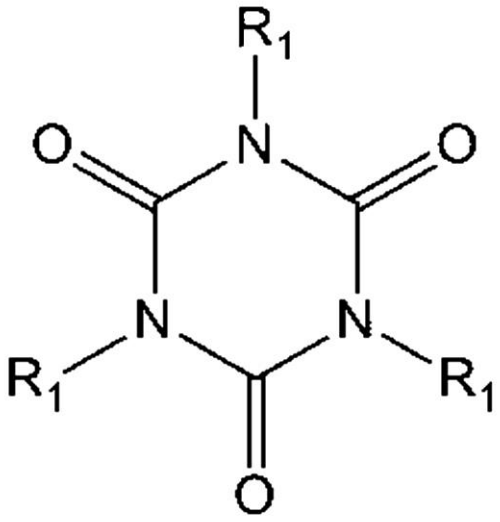
[Claims]

[Claim 1]

A negative-acting photosensitive resin composition comprising:

(A) a compound having a triazine ring represented by the following formula (1):

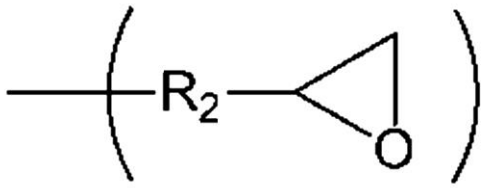
[Chemical Formula 1]



(1)

wherein all of R_1s represent an organic group represented by the following formula (1-1):

[Chemical Formula 2]

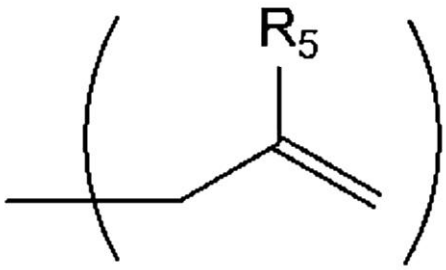


(1-1)

wherein R_2 represents a n-propylene group, or

one of R_1s represents an organic group represented by the above formula (1-1) wherein R_2 represents a methylene group and the other two of R_1s each represent an organic group represented by the following formula (1-4):

[Chemical Formula 3]



(1-4)

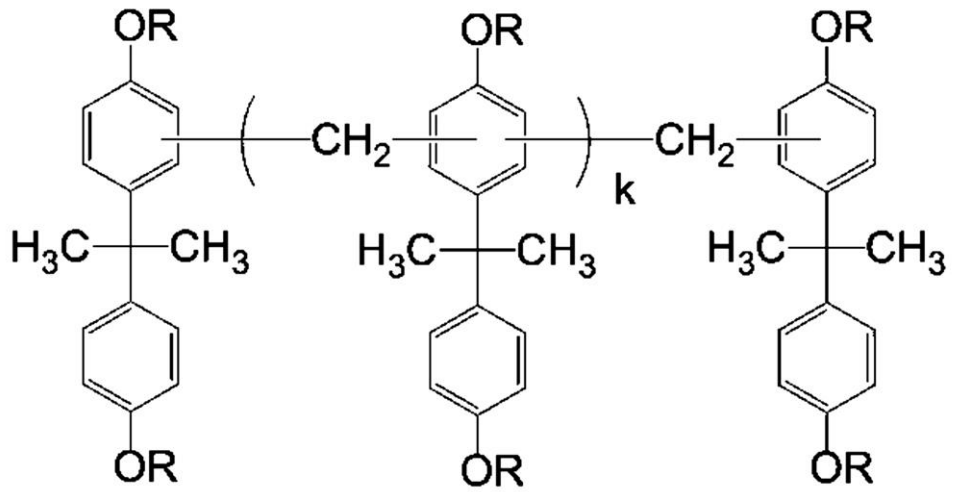
wherein R_5 represents a hydrogen atom;

(B) an epoxy resin having a benzene backbone and at least two epoxy groups in one molecule and having an epoxy equivalent weight of 500 g/eq or less,

wherein the epoxy resin (B) is a combination of:

an epoxy resin (B-1) represented by the following formula (2):

[Chemical Formula 4]

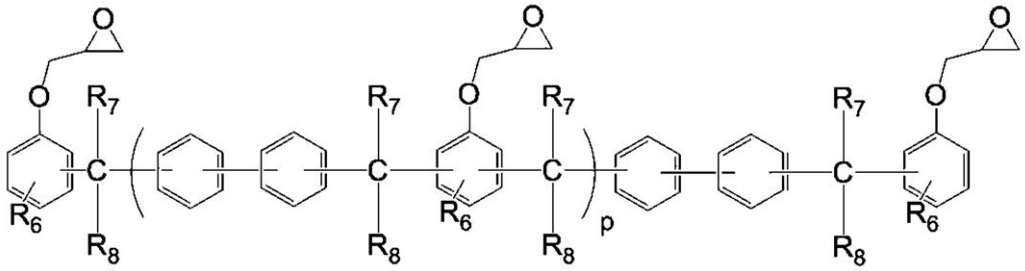


(2)

wherein Rs each independently represent a glycidyl group or a hydrogen atom, with the proviso that at least two Rs are glycidyl groups, and k represents an average and is a real number within a range of 0 to 30,

an epoxy resin (B-2) represented by the following formula (3):

[Chemical Formula 5]

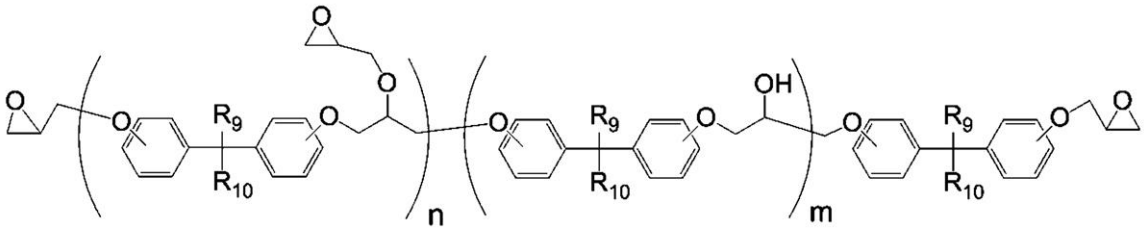


(3)

wherein R_6, R_7, and R_8 each independently represent a hydrogen atom or a C_{1-4} alkyl group, and p represents an average and is a real number within a range of 1 to 30, and

an epoxy resin (B-3) represented by the following formula (4):

[Chemical Formula 6]



(4)

wherein n and m each represent an average, n is a real number within a range of 1 to 30, m is a real number within a range of 0.1 to 30, and R_9 and R_{10} each independently represent a hydrogen atom, a C_{1-4} alkyl group, or a trifluoromethyl group; and

(C) a cationic photopolymerization initiator,

the negative-acting photosensitive resin composition being configured such that

the content of the compound (A) represented by formula (1) relative to the epoxy resin

(B) is 1 to 50 mass%, and
the epoxy resin (B) satisfies the following condition (i):
condition (i): having a weight-average molecular weight of 500 or more.

[Claim 2]
A dry film resist comprising the negative-acting photosensitive resin composition according to claim 1.

[Claim 3]
A cured product of the negative-acting photosensitive resin composition according to claim 1 or the dry film resist according to claim 2.

[Claim 4]
A wafer level package comprising the cured product according to claim 3.

[Claim 5]
An adhesive layer between a substrate and an adherend, comprising the cured product according to claim 3.