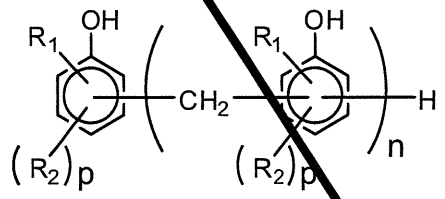
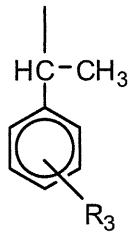
Claims

[Claim 1]

A polyhydric hydroxy resin represented by the following general formula (1) wherein a monohydric hydroxy compound represented by the following general formula (2) accounts for 3% or less by area when detected by gel permeation chromatography (GPC, RI detector);

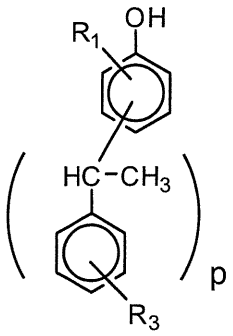


(1)



(a)

Here, R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by the following formula (a); n is a number of 0 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;

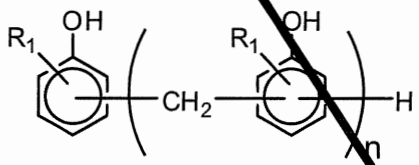


(2)

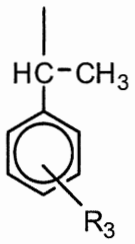
Here, p is a number of 0 to 3 and each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

[Claim 2]

A method for producing a polyhydric hydroxy resin that comprises reacting a polyhydric hydroxy compound represented by the following general formula (3) with a styrene in the presence of 10 to 400 wt ppm of an acid catalyst at a reaction temperature of 40 to 120℃ to introduce a substituent represented by the aforementioned formula (a) to the benzene rings of the polyhydric hydroxy compound;



(3)



(a)

Here, each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms and n is a number of 1 to 20.

[Claim 3]

A method for producing a polyhydric hydroxy resin described in claim 2 that comprises reacting 1 mole of the hydroxyl group of a polyhydric hydroxy compound represented by general formula (3) with 0.1 to 1.0 mole of a styrene.

[Claim 4]

An epoxy resin composition comprising an epoxy resin and a curing agent wherein a polyhydric hydroxy resin described in claim 1 is an essential component constituting a part or

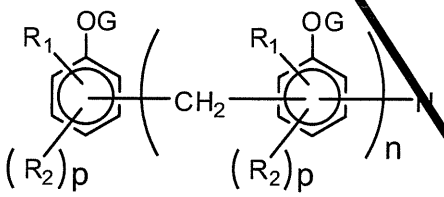
the whole of the curing agent.

[Claim 5]

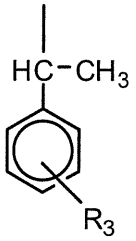
A cured product of epoxy resin produced by curing an epoxy resin composition described in claim 4.

[Claim 6]

An epoxy resin represented by the following general formula (4) wherein a monofunctional epoxy resin represented by the following general formula (5) accounts for 3% or less by area when detected by gel permeation chromatography;

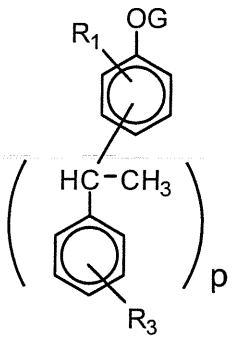


(4)



(a)

Here, G is a glycidyl group; R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 0 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;



(5)

Here, G is a glycidyl group; p is a number of 0 to 3: and each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

[Claim 7]

A method for producing an epoxy resin that comprises reacting a polyhydric hydroxy resin described in claim 1 with epichlorohyrin to convert the hydroxyl group of the polyhydric hydroxy resin to a glycidyl ether group.

[Claim 8]

An epoxy resin composition comprising an epoxy resin and a curing agent wherein an epoxy resin described in claim 6 is incorporated as an essential component.

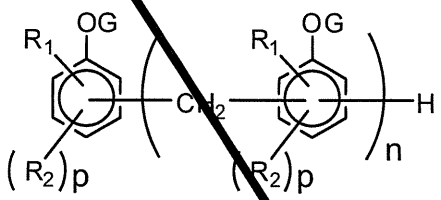
[Claim 9]

A cured product of epoxy resin produced by curing an epoxy resin composition described in claim 8.

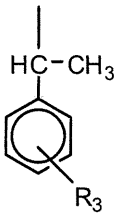
Claims

[Claim 1] (As amended)

An epoxy resin represented by the following general formula (4) wherein a monofunctional epoxy resin represented by the following general formula (5) accounts for 3% or less by area when detected by gel permeation chromatography;

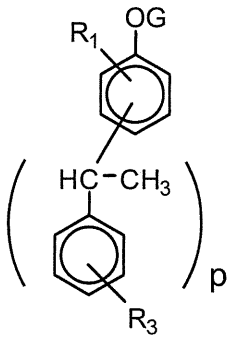


(4)



(a)

Here, G is a glycidyl group; R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 1 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;

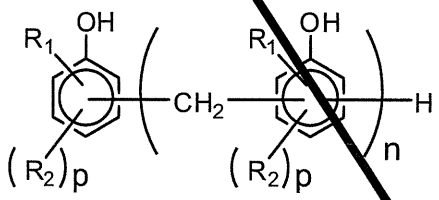


(5)

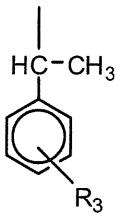
Here, G is a glycidyl group; p is a number of 0 to 3; each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

[Claim 2] (As amended)

A method for producing an epoxy resin that comprises reacting a polyhydric hydroxy resin wherein a monohydric hydroxy compound represented by the following general formula (2) accounts for 3% or less by area when detected by gel permeation chromatography (GPC, RI detector) with epichlorohydrin to convert the hydroxyl group of the polyhydric hydroxy resin to a glycidyl ether group;

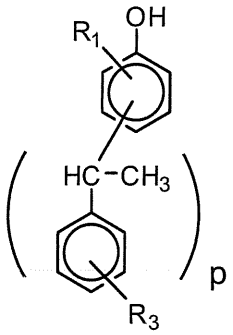


(1)



(a)

Here, R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 1 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;



(2)

Here, p is a number of 0 to 3 and each of R_1 and R_3 is a hydrogen atom or a hydrocarbon

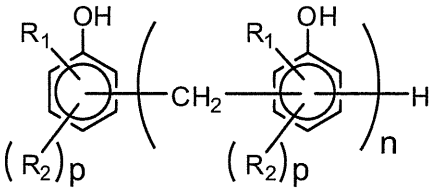
group of 1 to 6 carbon atoms.

[Claim 3] (As amended)

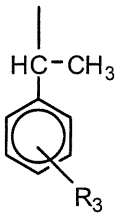
An epoxy resin composition comprising an epoxy resin and a curing agent wherein an epoxy resin described in claim 1 is incorporated as an essential component.

[Claim 4] (As amended)

An epoxy resin composition comprising an epoxy resin and a curing agent wherein a polyhydric hydroxy resin represented by the following general formula (1) is an essential component constituting a part or the whole of the curing agent and a monohydric hydroxy compound represented by the following general formula (2) in the said polyhydric hydroxy resin accounts for 3% or less by area when detected by gel permeation chromatography (GPC, RI detector);

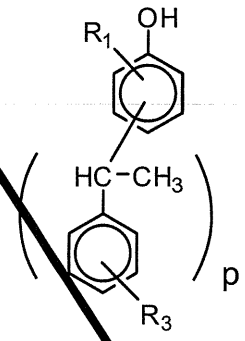


(1)



(a)

Here, R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 1 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;



(2)

Here, p is a number of 0 to 3 and each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

[Claim 5] (As amended)

A cured product of epoxy resin produced by curing an epoxy resin composition described in claim 3.

[Claim 6] (As amended)

A cured product of epoxy resin produced by curing an epoxy resin composition described in claim 4.

[Claim 7] (Deleted)

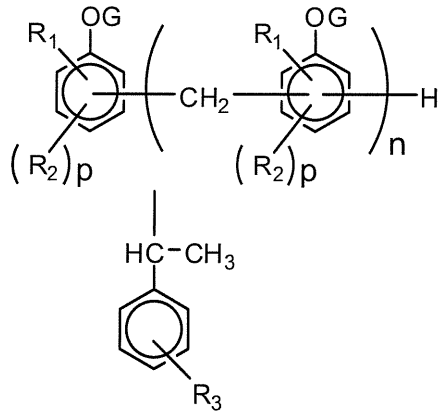
[Claim 8] (Deleted)

[Claim 9] (Deleted)

Claims

[Claim 1]

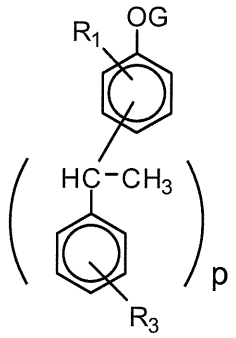
An epoxy resin represented by the following general formula (4) wherein a monofunctional epoxy resin represented by the following general formula (5) accounts for 3% or less by area when detected by gel permeation chromatography;



(4)

(a)

Here, G is a glycidyl group; R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 1 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;



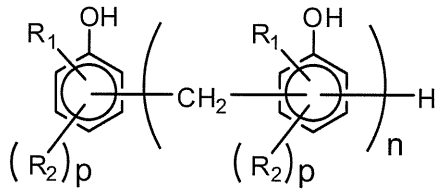
(5)

Here, G is a glycidyl group; p is a number of 0 to 3; each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

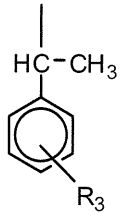
[Claim 2]

A method for producing an epoxy resin that comprises reacting a polyhydric hydroxy resin wherein a monohydric hydroxy compound represented by the following general formula (2) accounts for 3% or less by area when detected by gel

permeation chromatography (GPC, RI detector) with epichlorohydrin to convert the hydroxyl group of the polyhydric hydroxy resin to a glycidyl ether group;

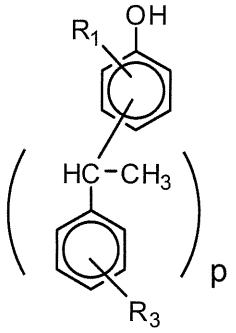


(1)



(a)

Here, R_1 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms; R_2 is a substituent represented by formula (a); n is a number of 1 to 20; p is a number of 0.1 to 2.5; and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms;



(2)

Here, p is a number of 0 to 3 and each of R_1 and R_3 is a hydrogen atom or a hydrocarbon group of 1 to 6 carbon atoms.

[Claim 3]

An epoxy resin composition comprising an epoxy resin and a curing agent wherein an epoxy resin described in claim 1 is incorporated as an essential component.

[Claim 4]

A cured product of epoxy resin produced by curing an epoxy resin composition described in claim 3.