Claims

[Claim 1] An aqueous coating composition, comprising:

(A) an aqueous epoxy-based polyamine resin having one or more primary amino groups and/or secondary amino groups in a molecule;

(B) a compound having one or more (meth)acryloyl groups in a molecule; and

(C) an alkoxysilane compound;

wherein:

an equivalent ratio of an amino group of the aqueous epoxy-based polyamine resin (A) and a (meth)acryloyl group of the compound (B) ((meth)acryloyl group/amino group) is 0.7 to 2.5; and

a content of the alkoxysilane compound (C) in a solid content of the aqueous coating composition is 0.2 mass% to 5 mass%.

[Claim 2] An aqueous coating composition according to claim 1, wherein

the aqueous coating composition is a two-component aqueous coating composition comprising a base resin liquid for a coating material and a curing agent,

the base resin liquid for a coating material comprising the aqueous epoxy-based polyamine resin (A) and

the curing agent comprising the compound (B) and the alkoxysilane compound (C).

[Claim 3] An aqueous coating composition according to claim 1 or 2, wherein the aqueous epoxy-based polyamine resin (A) is

~~water-dispersible.~~

[Claim 4] An aqueous coating composition according to any one of claims 1 to 3, wherein the aqueous epoxy-based polyamine resin (A) has an amino group equivalent of 100 to 3,000.

[Claim 5] An aqueous coating composition according to any one of claims 1 to 4, wherein the aqueous epoxy-based polyamine resin (A) is obtained by amine-modification of an epoxy resin, and the epoxy resin has an epoxy equivalent of 180 to 3,800.

[Claim 6] An aqueous coating composition according to any one of claims 1 to 4, wherein the aqueous epoxy-based polyamine resin (A) comprises:

an aqueous epoxy-based polyamine resin (A1) obtained by amine-modification of an epoxy resin (a1) having an epoxy equivalent of 400 to 1,500; and

an aqueous epoxy-based polyamine resin (A2) obtained by amine-modification of an epoxy resin (a2) having an epoxy equivalent of 2,000 to 3,200.

[Claim 7] An aqueous coating composition according to claim 6, wherein a mass ratio of the epoxy resin (a1) and the epoxy resin (a2) (a1/a2) is 8/2 to 2/8.

~~[Claim 8] An aqueous coating composition according to any one of~~ claims 1 to 7, wherein the aqueous epoxy-based polyamine resin (A) is obtained by neutralization of an amino group of an epoxy-based polyamine resin with an acid, and a neutralization ratio in the neutralization is 10% to 70%.

[Claim 9] An aqueous coating composition according to any one of claims 1 to 8, wherein the compound (B) has a viscosity at 25°C of 3,000 mPa·s or less.

[Claim 10] An aqueous coating composition according to any one of claims 1 to 9, further comprising a pigment, wherein the pigment has a pigment volume concentration of 20% to 50%.

[Claim 11] A method of forming a coating film, comprising applying the aqueous coating composition according to any one of claims 1 to 10 onto a substrate surface to form a coating film.

[Claim 12] A method of forming a coating film according to claim 11, further comprising applying a top coating material on the coating film to form a top coating layer.

Claims

[Claim 1] An aqueous coating composition, comprising:

(A) an aqueous epoxy-based polyamine resin having one or more primary amino groups and/or secondary amino groups in a molecule;

(B) a compound having one or more (meth)acryloyl groups in a molecule; and

(C) an alkoxysilane compound;

wherein an equivalent ratio of an amino group of the aqueous epoxy-based polyamine resin (A) and a (meth)acryloyl group of the compound (B) ((meth)acryloyl group/amino group) is 0.7 to 2.5; and a content of the alkoxysilane compound (C) in a solid content of the aqueous coating composition is 0.2 mass% to 5 mass%;

wherein the aqueous coating composition is a two-component aqueous coating composition comprising a base resin liquid for a coating material and a curing agent,

the base resin liquid for a coating material comprising the aqueous epoxy-based polyamine resin (A) and

the curing agent comprising the compound (B) and the alkoxysilane compound (C);

wherein the aqueous epoxy-based polyamine resin (A) has an amino group equivalent of 100 to 3,000; and

wherein the aqueous epoxy-based polyamine resin (A) is obtained by amine-modification of an epoxy resin, and the epoxy resin has an epoxy equivalent of 180 to 3,800.

[Claim 2] An aqueous coating composition according to claim 1, wherein the aqueous epoxy-based polyamine resin (A) is water-dispersible.

[Claim 3] An aqueous coating composition according to any one of claims 1 to 2, wherein the aqueous epoxy-based polyamine resin (A) comprises:

an aqueous epoxy-based polyamine resin (A1) obtained by amine-modification of an epoxy resin (a1) having an epoxy equivalent of 400 to 1,500; and

an aqueous epoxy-based polyamine resin (A2) obtained by amine-modification of an epoxy resin (a2) having an epoxy equivalent of 2,000 to 3,200.

[Claim 4] An aqueous coating composition according to claim 3, wherein a mass ratio of the epoxy resin (a1) and the epoxy resin (a2) (a1/a2) is 8/2 to 2/8.

[Claim 5] An aqueous coating composition according to any one of claims 1 to 4, wherein the aqueous epoxy-based polyamine resin (A) is obtained by neutralization of an amino group of an epoxy-based polyamine resin with an acid, and a neutralization ratio in the neutralization is 10% to 70%.

[Claim 6] An aqueous coating composition according to any one of claims 1 to 7, wherein the compound (B) has a viscosity at 25°C of 3,000 mPa·s or less.

[Claim 7] An aqueous coating composition according to any one of claims 1 to 6, further comprising a pigment, wherein the pigment has a pigment volume concentration of 20% to 50%.

[Claim 8] A method of forming a coating film, comprising applying the aqueous coating composition according to any one of claims 1 to 7 onto a substrate surface to form a coating film.

[Claim 9] A method of forming a coating film according to claim 8, further comprising applying a top coating material on the coating film to form a top coating layer.