Prior Art Document

Patent Document

[0004] [PTL 1] JP 11-166153 A

Summary ~~of Invention~~

[0004a] In a first aspect of the present disclosure, there is provided a method of forming a coating film, comprising coating a substrate with an aqueous coating composition and air drying the aqueous coating composition to form a coating film, 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 comprises an aqueous epoxy-based polyamine resin (A) having one or more primary amino groups and/or secondary amino groups in a molecule, the curing agent comprises a compound (B) having one or more (meth)acryloyl groups in a molecule.

Problem to be solved by the Invention

[0005] The present invention has been made to solve the conventional problem, and an object of the present invention is to provide a method for forming a coating film which is excellent in low-temperature curability.

Means for solving the Problems

[0006] A method of forming a coating film according to an

embodiment of the present invention includes coating a substrate with an aqueous coating composition to form a coating film, wherein the aqueous coating composition includes: an aqueous epoxy-based polyamine resin (A) having one or more primary amino groups and/or secondary amino groups in a molecule; and a compound (B) having one or more (meth)acryloyl groups in a molecule.

In a preferred embodiment of the invention, the aqueous coating composition is a two-component aqueous coating composition including a base resin liquid for a coating material and a curing agent, the base resin liquid for a coating material comprising the aqueous

Claims

[Claim 1] A method of forming a coating film, comprising coating a substrate with an aqueous coating composition and air drying the aqueous coating composition to form a coating film, 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 comprises~~:~~ an aqueous epoxy-based polyamine resin (A) having one or more primary amino groups and/or secondary amino groups in a molecule~~; and a compound (B) having one or more (meth)acryloyl groups in a molecule~~,

the curing agent comprises a compound (B) having one or more (meth)acryloyl groups in a molecule.

~~[Claim 2] A method of forming a coating film 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).~~

[Claim ~~3~~2] A method of forming a coating film according to claim 1 ~~or 2~~, wherein the aqueous epoxy-based polyamine resin (A) is water-dispersible.

[Claim ~~4~~3] A method of forming a coating film according to ~~any one of~~ claim~~s~~ 1 or~~to~~ 2~~3~~, wherein the aqueous epoxy-based polyamine resin (A) has an amino group equivalent of 100 to 3,000.

[Claim ~~5~~4] A method of forming a coating film according to any one

of claims 1 to ~~4~~3, 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~~5] A method of forming a coating film according to any one of claims 1 to ~~4~~3, wherein the aqueous epoxy-based polyamine resin (A) in the aqueous coating composition 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~~6] A method of forming a coating film according to claim ~~6~~5, wherein a mass ratio of the epoxy resin (a1) and the epoxy resin (a2) (a1/a2) is 8/2 to 2/8.

[Claim ~~8~~7] A method of forming a coating film according to any one of claims 1 to ~~7~~6, 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~~8] A method of forming a coating film according to any one of

claims 1 to ~~8~~7, wherein the compound (B) has a viscosity at 25°C of 3,000 mPa·s or less.

[Claim ~~10~~9] A method of forming a coating film according to any one of claims 1 to ~~9~~8, wherein the compound (B) has a molecular weight of 150 or more and 2,000 or less.

[Claim ~~11~~10] A method of forming a coating film according to any one of claims 1 to ~~10~~9, further comprising forming a top coating layer on the coating film after the forming of the coating film with the aqueous coating composition.

[Claim 11~~2~~] A method of forming a coating film according to claim 10~~1~~, further comprising forming an intermediate coating layer after the forming of the coating film with the aqueous coating composition and before the forming of the top coating layer.

[Claim 12~~3~~] A method of forming a coating film according to any one of claims 1 to 11~~2~~, further comprising forming a undercoating layer on substrate before the forming of the coating film with the aqueous coating composition.