storage for a long period of time.

RELATED ART DOCUMENTS

PATENT DOCUMENTS

[0004] Patent Document 1: Japanese Unexamined Patent Application Publication No. H07-145291

SUMMARY

PROBLEM TO BE SOLVED

[0005] The present disclosure has been made in consideration of such circumstances. It is an object of the present disclosure to provide a method for producing an acrylic rubber capable of realizing excellent storage stability while keeping normal physical properties good.

MEANS FOR SOLVING THE PROBLEM

[0006] The present inventors have intensively studied to achieve the above object. As a result, it has been found that, in a method for producing an acrylic rubber, emulsion polymerization is performed by combining particular two emulsifiers, the obtained polymerized emulsion liquid is coagulated using a metallic sulfate, and the obtained hydrous crumb is washed and dried, whereby an acrylic rubber capable of realizing excellent storage stability while keeping normal physical properties good can be produced.

[0007] In addition, the present inventors have found that the object of the present disclosure can be further highly achieved by employing at least one of the following examples: the acrylic rubber comprises a cross-linkable functional group, using two emulsifiers in a specific ratio and using a redox-based polymerization catalyst as a polymerization initiator, in particular combining particular two reducing agents, using a monovalent or divalent metal sulfate as a

coagulant, and contacting a polymerized emulsion liquid with a metal sulfate while being warmed and performing washing comprising acid washing. Thus, the present inventors have accomplished the present disclosure.

[0008] Accordingly, in an aspect, the present disclosure provides a method for producing an acrylic rubber comprising: an emulsion polymerization step of emulsion polymerizing a monomer comprising a (meth)acrylic acid ester and at least one cross-linkable monomer selected from the group consisting of a carboxyl group-containing monomer, an epoxy group-containing monomer and a halogen group-containing monomer in the presence of a nonionic emulsifier and an anionic emulsifier with a polymerization initiator to obtain a polymerized emulsion liquid; a coagulation step of coagulating the polymerized emulsion liquid by contacting with a metal sulfate to obtain a hydrous crumb; a washing step of performing washing on the hydrous crumb; and a drying step of drying the hydrous crumb that is washed.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the use ratio of the nonionic emulsifier and the anionic emulsifier is in the range of 1/99 to 99/1 in terms of a weight ratio of the nonionic emulsifier/the anionic emulsifier.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the use ratio of the nonionic emulsifier and the anionic emulsifier is in the range of 50/50 to 75/25 in terms of a weight ratio of the nonionic emulsifier/the anionic emulsifier.

[0009] In the method for producing the acrylic rubber of the present disclosure, it is preferable that the polymerization initiator is used in combination with a reducing agent.

In the method for producing the acrylic rubber of the present

disclosure, it is preferable that at least two compounds are used as the reducing agent.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the metal ion-containing compound in a reduced state and a reducing agent other than the metal ion-containing compound in the reduced state are used in combination as the reducing agent.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the metal ion-containing compound in the reduced state is ferrous sulfate.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the reducing agent other than the metal ion-containing compound in the reduced state is sodium formaldehyde sulfoxylate, ascorbic acid or ascorbate.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the reducing agent other than the metal ion-containing compound in the reduced state is ascorbate.

[0010] In the method for producing the acrylic rubber of the present disclosure, it is preferable that the polymerization initiator is an organic peroxide or an inorganic peroxide.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that contacting the polymerized emulsion liquid with the metal sulfate is carried out in a manner of adding the metal sulfate to the polymerized emulsion liquid or in a manner of adding the polymerized emulsion liquid into a solution of the metal sulfate or a dispersion of the metal sulfate.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that a contacting temperature of the polymerized emulsion liquid and the metal sulfate is 60 °C or higher.

In the method for producing the acrylic rubber of the present

disclosure, it is preferable that the metal sulfate is a monovalent or divalent metal sulfate.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the anionic emulsifier is a phosphate ester salt.

In the method for producing the acrylic rubber of the present disclosure, it is preferable that the washing comprises acid washing.

[0011] Further, in another aspect, the present disclosure provides an acrylic rubber produced by the method as mentioned above.

In the acrylic rubber of the present disclosure, it is preferable that a monomer composition is 50 to 99.9 wt% of (meth)acrylic acid ester monomer units, 0.01 to 20 wt% of cross-linkable monomer units, and 0 to 49.99 wt% of other copolymerizable monomer units.

In the acrylic rubber of the present disclosure, it is preferable that a Mooney viscosity (ML1+4, 100 °C) is in the range of 10 to 150.

[0012] Further, in another aspect, the present disclosure provides a rubber composition comprising a rubber ingredient and a cross-linking agent, the rubber ingredient comprising the acrylic rubber as mentioned above.

In the rubber composition of the present disclosure, it is preferable that the cross-linking agent is at least one selected from the group consisting of a polyvalent amine compound, a polyvalent epoxy compound, a polyvalent carboxylic acid, an organic carboxylic acid ammonium salt, an organic carboxylic acid metal salt, an isocyanuric acid compound, a triazine compound, and a metal soap/sulfur.

In the rubber composition of the present disclosure, it is preferable that the rubber composition further comprises a cross-

linking accelerator.

In the rubber composition of the present disclosure, it is preferable that the cross-linking accelerator is at least one selected

from the group consisting of a guanidine-based cross-linking accelerator, a diazabicycloalkene-based cross-linking accelerator, an aliphatic secondary amine-based cross-linking accelerator, an aliphatic tertiary amine-based cross-linking accelerator, and a dithiocarbamate-based vulcanizing accelerator.

In the rubber composition of the present disclosure, it is preferable that the rubber composition further comprises a scorch inhibitor.

In the rubber composition of the present disclosure, it is preferable that the rubber composition further comprises an antioxidant.

In the rubber composition of the present disclosure, it is preferable that the rubber composition further comprises a filler.

Further, in a further aspect, the present disclosure provides a cross-linked rubber obtained by cross-linking the rubber composition as mentioned above.

EFFECTS

[0013] According to the present disclosure, it is possible to provide an acrylic rubber capable of realizing excellent storage stability while keeping normal physical properties good, and a rubber composition containing the acrylic rubber, and the cross-linked rubber.

DESCRIPTION OF EMBODIMENTS

[0014] [Production method]

The method for producing an acrylic rubber of the present invention comprises: an emulsion polymerization step of emulsion polymerizing a monomer comprising a (meth)acrylic acid ester and at least one cross-linkable monomer selected from the group consisting of a carboxyl group-containing monomer, an epoxy group-containing monomer and

a halogen group-containing monomer in the presence of a nonionic emulsifier and an anionic emulsifier with a polymerization initiator to