Claims

[Claim 1]

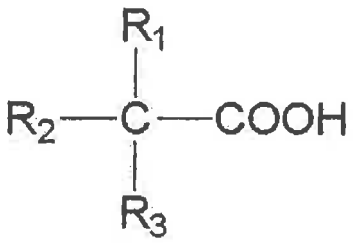
A method for producing a polymer, comprising:

step 1 of preparing a polymer solution comprising at least titanium, or at least lithium and titanium;

step 2 of adding and mixing water in a volume 0.1 to 20 times a volume of the polymer solution and an acid compound selected from compounds represented by the following formula (1) to the polymer solution to thereby obtain a mixed liquid; and

step 3 of removing a water phase from the mixed liquid to thereby obtain a refined polymer solution:

[Formula 1]



(1)

wherein R_1, R_2 and R_3 are each independently a substituent constituted of an element selected from C, H, O and N, and

wherein the acid compound comprises 4 or more oxygen atoms in the molecule,

wherein in step (2), the mixing is carried out by using a rotary dispersing machine having a meshing

structure, and in the operation of the rotary dispersing machine, the P/V value is $3x10^4$ (kW/m^3) or more.

[Claim 2]

The method for producing the polymer according to claim 1, wherein the acid compound has number of a hydroxyl group (provided that -OH of a carboxyl group is excluded) of 0 or 1.

[Claim 3]

The method for producing the polymer according to claim 1 or 2, wherein the polymer solution further comprises aluminum.

[Claim 4]

The method for producing the polymer according to any one of claims 1 to 3, wherein the acid compound has a total number of oxygen atoms of 5 or more.

[Claim 5]

The method for producing the polymer according to any one of claims 1 to 4, wherein the acid compound has a total number of oxygen atoms of 7 or more.

[Claim 6]

The method for producing the polymer according to any one of claims 1 to 5, wherein the acid compound has a total number of carbon atoms of 20 or less.

[Claim 7]

The method for producing the polymer according to any one of claims 1 to 6, wherein the acid compound is a polyvalent carboxylic acid.

[Claim 8]

The method for producing the polymer according to any one of claims 1 to 7, wherein the acid compound comprises 3 or more carboxyl groups.

[Claim 9]

The method for producing the polymer according to any one of claims 1 to 8, wherein in the step 2, an oxidizing agent is further added and mixed.

[Claim 10]

The method for producing the polymer according to claim 9, wherein the oxidizing agent is hydrogen peroxide.

[Claim 11]

The method for producing the polymer according to any one of claims 1 to 10, wherein R_1, R_2 and R_3 in the formula (1) are the substituent constituted of an element selected from C, H and O.

[Claim 12]

The method for producing the polymer according to any one of claims 1 to 11, wherein in the step 3, the water phase comprises lithium and/or titanium.

[Claim 13]

The method for producing the polymer according to any one of claims 1 to 12, wherein in the step 2, the mixed liquid has an alcohol concentration of 500 ppm or less.

Claims

[Claim 1]

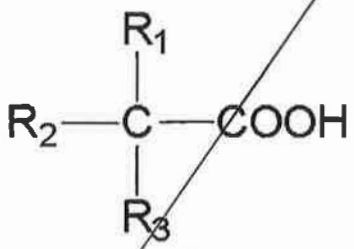
A method for producing a polymer, comprising:

step 1 of preparing a polymer solution comprising at least lithium and/or titanium;

step 2 of adding and mixing water in a volume 0.1 to 20 times a volume of the polymer solution and an acid compound selected from compounds represented by the following formula (1) to the polymer solution to thereby obtain a mixed liquid; and

step 3 of removing a water phase from the mixed liquid to thereby obtain a refined polymer solution:

[Formula 1]



(1)

wherein R_1, R_2 and R_3 are each independently a substituent constituted of an element selected from C, H, O and N, and

wherein the acid compound comprises 4 or more oxygen atoms in the molecule.

[Claim 2]

The method for producing the polymer according to claim 1, wherein the polymer solution comprises at least titanium.

[Claim 3]

The method for producing the polymer according to claim 1 or 2, wherein the acid compound has number of a hydroxyl group (provided that -OH of a carboxyl group is excluded) of 0 or 1.

[Claim 4]

The method for producing the polymer according to any one of claims 1 to 3, wherein the polymer solution further comprises aluminum.

[Claim 5]

The method for producing the polymer according to any one of claims 1 to 4, wherein the acid compound has a total number of oxygen atoms of 5 or more.

[Claim 6]

The method for producing the polymer according to any one of claims 1 to 5, wherein the acid compound has a total number of oxygen atoms of 7 or more.

[Claim 7]

The method for producing the polymer according to any one of claims 1 to 6, wherein the acid compound has a total number of carbon atoms of 20 or less.

[Claim 8]

The method for producing the polymer according to any one of claims 1 to 7, wherein the acid compound is a polyvalent carboxylic acid.

[Claim 9]

The method for producing the polymer according to any one of claims 1 to 8, wherein the acid compound comprises 3 or more carboxyl groups.

[Claim 10]

The method for producing the polymer according to any one of claims 1 to 9, wherein in the step 2, an oxidizing agent is further added and mixed.

[Claim 11]

The method for producing the polymer according to claim 10, wherein the oxidizing agent is hydrogen peroxide.

[Claim 12]

The method for producing the polymer according to any one of claims 1 to 11, wherein R_1, R_2 and R_3 in the formula (1) are the substituent constituted of an element selected from C, H and O.

[Claim 13]

The method for producing the polymer according to any one of claims 1 to 12, wherein in the step 2, the mixing is carried out by using a rotary dispersing machine having a meshing structure.

[Claim 14]

The method for producing the polymer according to any one of claims 1 to 13, wherein in the step 3, the water phase comprises lithium and/or titanium.

[Calim 15]

The method for producing the polymer according to any one of claims 1 to 14, wherein in the step 2, the mixed liquid has an alcohol concentration of 500 ppm or less.