bis(4-hydroxyphenyl)sulfone,

bis(4-hydroxyphenyl)ketone, and the like.

[0056]

In terms of availability of raw materials or usefulness of polycarbonate, as the aromatic dihydroxy compound, bisphenol A or bisphenol AF is preferable and bisphenol A is particularly preferable.

[0057]

(Condensation catalyst)

As the condensation catalyst, basic ester exchange catalysts are exemplified.

Examples of the basic ester exchange catalyst include nitrogen-containing compounds, alkali metal compounds, alkaline earth metal compounds, and the like.

Examples of the nitrogen-containing compound include amines, quaternary ammonium hydroxide, salts of amines, and the like.

Examples of the alkali metal compound or the alkaline earth metal compound include organic acid salts, inorganic salts, oxides, hydroxides, hydrides, alkoxides and the like of alkali metal or alkaline earth metal.

The condensation catalyst may be used one kind alone or used in combination of two or more kinds thereof.

In terms of high polymerization activity and excellent applicability to solution polymerization that produces a prepolymer, amines are preferable as the condensation catalyst.

[0058]

Specific examples of the nitrogen-containing compound include tertiary amines (triethylamine, tripropylamine, tributylamine, triisoamylamine, trihexylamine, triheptylamine, trioctylamine, tridodecylamine, etc.), secondary amines (diethylamine, dibutylamine, etc.), primary amines (propylamine, butylamine, etc.), imidazoles (2-methylimidazole, 2-phenylimidazole, benzoimidazole, etc.), quaternary ammonium hydroxides including alkyl group and/or an aryl group (tetramethyl ammonium hydroxide, tetraethyl ammonium hydroxide, tetrapropyl ammonium hydroxide, tetrabutyl ammonium hydroxide, trimethylbenzylammonium hydroxide, etc.), and the like.

[0059]

Specific examples of the alkali metal compound include sodium hydroxide, potassium hydroxide, cesium hydroxide, lithium hydroxide, sodium hydrogen carbonate, sodium carbonate, potassium carbonate, cesium carbonate, lithium carbonate, sodium acetate, potassium acetate, cesium acetate, lithium acetate, sodium stearate, potassium stearate, cesium stearate, lithium stearate, sodium borohydride, sodium phenylated boron, sodium phenylated boron, sodium benzoate, potassium benzoate, cesium benzoate, lithium benzoate, disodium hydrogen phosphate, dipotassium hydrogen phosphate, disodium

phenyl phosphate, sodium gluconate, and disodium salts, dipotassium salts, dicesium salts, and dilithium salts of bisphenol A, and sodium salts, potassium salts, cesium salts, and lithium salts of phenol, and the like.

[0060]

Specific examples of the alkaline earth metal compound include magnesium hydroxide, calcium hydroxide, strontium hydroxide, barium hydroxide, magnesium hydrogencarbonate, calcium hydrogencarbonate, strontium hydrogencarbonate, barium hydrogencarbonate, magnesium carbonate, calcium carbonate, strontium carbonate, barium carbonate, magnesium acetate, calcium acetate, strontium acetate, barium acetate, magnesium stearate, calcium stearate, calcium benzoate, magnesium phenyl phosphate, and the like.

[0061]

(Step (a))

A fluorine-containing carbonate and an aromatic dihydroxy compound are reacted with each other in the presence of a condensation catalyst, to obtain a prepolymer.

Specifically, for example, a fluorine-containing carbonate and an aromatic dihydroxy compound are reacted in a solvent in the presence of a condensation catalyst and then the solvent and a fluorine-containing alcohol which is produced as a by-product are distilled away, thereby obtaining a solid prepolymer. It is preferable that the prepolymer is dried at a temperature lower than the glass transition temperature of the prepolymer.

[0062]

The molar ratio of the fluorine-containing carbonate to the aromatic dihydroxy compound (fluorine-containing carbonate/aromatic dihydroxy compound) in the step (a) is preferably from 1/1 to 2/1, more preferably from 1/1 to 1.3/1, and particularly preferably from 1.02/1 to 1.2/1. When the molar ratio of the fluorine-containing carbonate to the aromatic dihydroxy compound is in the above-described range, a prepolymer having a constituent unit derived from the fluorine-containing carbonate at the terminal thereof is easily obtained. In the prepolymer having a constituent unit derived from the fluorine-containing carbonate at the terminal thereof, solid phase polymerization easily proceeds without crystallizing the prepolymer as described below. Moreover, the solid phase polymerization proceeds even at a temperature lower than the glass transition temperature of the prepolymer.

[0063]

The mass average molecular weight of the prepolymer is preferably from 1,000 to 10,000, more preferably from 1,000 to 7,000, and particularly preferably from 1,000 to 5,000. When the mass average molecular weight of the prepolymer is in the above-described range, the prepolymer is in a powder state and solid phase polymerization in the step (b) easily proceeds.

bis(4-hydroxyphenyl)sulfone,

bis(4-hydroxyphenyl)ketone, and the like.

[0056]

In terms of availability of raw materials or usefulness of polycarbonate, as the aromatic dihydroxy compound, bisphenol A or bisphenol AF is preferable and bisphenol A is particularly preferable.

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(Condensation catalyst)

As the condensation catalyst, basic ester exchange catalysts are exemplified.

Examples of the basic ester exchange catalyst include nitrogen-containing compounds, alkali metal compounds, alkaline earth metal compounds, and the like.

Examples of the nitrogen-containing compound include amines, quaternary ammonium hydroxide, salts of amines, and the like.

Examples of the alkali metal compound or the alkaline earth metal compound include organic acid salts, inorganic salts, oxides, hydroxides, hydrides, alkoxides and the like of alkali metal or alkaline earth metal.

The condensation catalyst may be used one kind alone or used in combination of two or more kinds thereof.

In terms of high polymerization activity and excellent applicability to solution polymerization that produces a prepolymer, amines are preferable as the condensation catalyst.

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Specific examples of the nitrogen-containing compound include tertiary amines (triethylamine, tripropylamine, tributylamine, triisoamylamine, trihexylamine, triheptylamine, trioctylamine, tridodecylamine, etc.), secondary amines (diethylamine, dibutylamine, etc.), primary amines (propylamine, butylamine, etc.), imidazoles (2-methylimidazole, 2-phenylimidazole, benzoimidazole, etc.), quaternary ammonium hydroxides including alkyl group and/or an aryl group (tetramethyl ammonium hydroxide, tetraethyl ammonium hydroxide, tetrapropyl ammonium hydroxide, tetrabutyl ammonium hydroxide, trimethylbenzylammonium hydroxide, etc.), and the like.

[0059]

Specific examples of the alkali metal compound include sodium hydroxide, potassium hydroxide, cesium hydroxide, lithium hydroxide, sodium hydrogen carbonate, sodium carbonate, potassium carbonate, cesium carbonate, lithium carbonate, sodium acetate, potassium acetate, cesium acetate, lithium acetate, sodium stearate, potassium stearate, cesium stearate, lithium stearate, sodium borohydride, sodium phenylated boron, sodium benzoate, potassium benzoate, cesium benzoate, lithium benzoate, disodium hydrogen phosphate, dipotassium hydrogen phosphate, disodium phenyl phosphate,

sodium gluconate, and disodium salts, dipotassium salts, dicesium salts, and dilithium salts of bisphenol A, and sodium salts, potassium salts, cesium salts, and lithium salts of phenol, and the like.

[0060]

Specific examples of the alkaline earth metal compound include magnesium hydroxide, calcium hydroxide, strontium hydroxide, barium hydroxide, magnesium hydrogencarbonate, calcium hydrogencarbonate, strontium hydrogencarbonate, barium hydrogencarbonate, magnesium carbonate, calcium carbonate, strontium carbonate, barium carbonate, magnesium acetate, calcium acetate, strontium acetate, barium acetate, magnesium stearate, calcium stearate, calcium benzoate, magnesium phenyl phosphate, and the like.

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The mass average molecular weight of the prepolymer is preferably from 1,000 to 10,000, more preferably from 1,000 to 7,000, and particularly preferably from 1,000 to 5,000. When the mass average molecular weight of the prepolymer is in the above-described range, the prepolymer is in a powder state and solid phase polymerization in the step (b) easily proceeds.