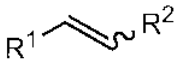
CLAIMS

1. A method of producing a polymer, comprising a polymerization step of obtaining a polymer by controlled radical polymerization of a monomer (Y) in the presence of an organic compound (A) represented by a formula (I) below and a radical generator (B), wherein

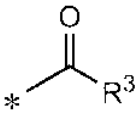
a molar ratio (B/A) of (B) to (A) is from 0.5 to 20, and

a polymerization temperature is from 0°C to 80°C.



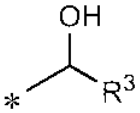
(I)

In the formula (I), R^1 denotes an alkenyl group or an aryl group, R^2 denotes a group represented by a formula (II) or (III) below, and R^1 and R^2 optionally form a ring by coupling with each other.



(II)

In the formula (II), R^3 denotes a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkenyl group, an alkoxy group, an amino group, a nitro group, a cyano group, an acetyl group, a trifluoromethyl group, or a hydroxyl group, and * denotes a bond.



(III)

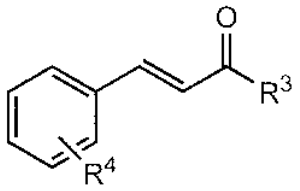
In the formula (III), R^3 is the same as that in the formula (II) above and * denotes a bond.

2. The method of producing a polymer according to Claim 1, wherein R^1 is

an aryl group.

3. The method of producing a polymer according to Claim 1 or 2, wherein the organic compound (A) is an E isomer.

4. The method of producing a polymer according to Claim 3, wherein the organic compound (A) is represented by a formula (IV) below.



(IV)

In the formula (IV), R^3 is the same as that in the formula (II) above and R^4 denotes a hydrogen atom, an alkyl group, an alkoxy group, or a hydroxyl group.

5. The method of producing a polymer according to Claim 4, wherein R^4 is a hydrogen atom.

6. The method of producing a polymer according to any one of Claims 1 through 5, wherein R^3 is a methoxy group or a hydroxyl group.

7. The method of producing a polymer according to any one of Claims 1 through 6, wherein a molar ratio (Y/A) of the monomer (Y) to the organic compound (A) is from 300 to 30000.

8. The method of producing a polymer according to any one of Claims 1 through 7, wherein the monomer (Y) includes an olefin, a vinyl ester, an acrylic

acid, an acrylic ester, an acrylamide-based monomer, a styrenic monomer, an N-vinylamide based monomer, or a dicarboxylic acid-based monomer.

9. The method of producing a polymer according to Claim 8, wherein the method comprises:

a polymerization step of obtaining a vinyl ester-based polymer by controlled radical polymerization of a vinyl ester in the presence of the organic compound (A) and the radical generator (B); and

a saponification step of obtaining a vinyl alcohol-based polymer by saponification of the obtained vinyl ester-based polymer.

10. The method of producing a polymer according to Claim 8, wherein the method comprises

a polymerization step of obtaining a vinyl ester-based block copolymer by sequentially performing, in the presence of the organic compound (A) and the radical generator (B), controlled radical polymerization of a vinyl ester and controlled radical polymerization of a vinyl ester and a monomer other than vinyl esters.

11. The method of producing a polymer according to Claim 10, wherein the method comprises:

a polymerization step of obtaining a vinyl ester-based block copolymer by sequentially performing, in the presence of the organic compound (A) and the radical generator (B), controlled radical polymerization of a vinyl ester and controlled radical polymerization of a vinyl ester and a monomer other than vinyl

esters; and

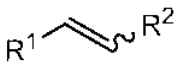
a saponification step of obtaining a vinyl alcohol-based block copolymer by saponification of the obtained vinyl ester-based block copolymer.

12. A composition for radical polymerization, comprising: an organic compound (A) represented by a formula (I) below; a radical generator (B); and a monomer (Y), wherein

a molar ratio (B/A) of (B) to (A) is from 0.5 to 20,

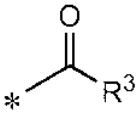
a molar ratio (Y/A) of the monomer (Y) to the organic compound (A) is from 300 to 30000 and

the monomer (Y) includes a vinyl ester or N-vinylpyrrolidone.



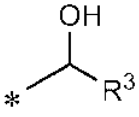
(I)

In the formula (I), R^1 denotes an alkenyl group or an aryl group, R^2 denotes a group represented by a formula (II) or (III) below, and R^1 and R^2 optionally form a ring by coupling with each other.



(II)

In the formula (II), R^3 denotes a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkenyl group, an alkoxy group, an amino group, a nitro group, a cyano group, an acetyl group, a trifluoromethyl group, or a hydroxyl group, and * denotes a bond.



(III)

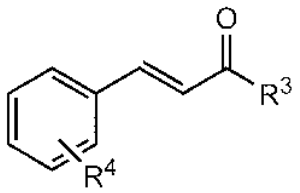
In the formula (III), R^3 is the same as that in the formula (II) above and *

denotes a bond.

13. The composition for radical polymerization according to Claim 12, wherein

the monomer (Y) includes a vinyl ester.

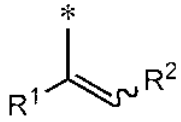
14. A radical polymerization control agent, comprising an organic compound (A) represented by a formula (IV) below.



(IV)

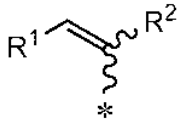
In the formula (IV), R^3 is the same as that in the formula (II) above and R^4 denotes a hydrogen atom, an alkyl group, an alkoxy group, or a hydroxyl group.

15. A polymer, comprising an end structure represented by a formula (V) or (VI) below, and comprising a vinyl ester unit or N-vinylpyrrolidone unit.



(V)

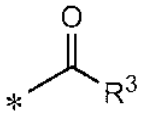
In the formula (V), R^1 denotes an alkenyl group or an aryl group, R^2 denotes a group represented by a formula (II) or (III) below, and R^1 and R^2 optionally form a ring by coupling with each other. * denotes a bond.



(VI)

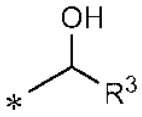
In the formula (VI), R^1 and R^2 are the same as those in the formula (V) above

and * denotes a bond.



(II)

In the formula (II), R^3 denotes a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkenyl group, an alkoxy group, an amino group, a nitro group, a cyano group, an acetyl group, a trifluoromethyl group, or a hydroxyl group, and * denotes a bond.



(III)

In the formula (III), R^3 is the same as that in the formula (II) above and * denotes a bond.