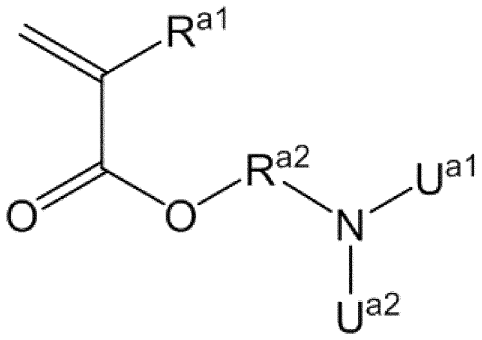
CLAIMS

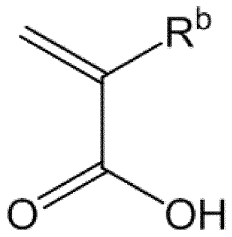
1. A method for producing a base film for producing cell aggregates, comprising:
a step of producing a polymer used as a base film for cell culture, which comprises a preparation step of preparing a mixture containing a monomer represented by the following formula (I):



(I)

wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms,
a radical polymerization initiator and an organic solvent, and a polymerization step of preparing a polymer by raising a temperature of the mixture under stirring to polymerize the monomer,
a step of preparing a base film-forming agent for cell culture, which comprises a step of mixing the polymer obtained by the above and a water-containing solution, and
a step of coating the base film-forming agent for cell culture obtained by the above onto a surface of a container or a substrate and drying the same.

2. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to Claim 1, wherein the mixture further contains a monomer represented by the formula (II):



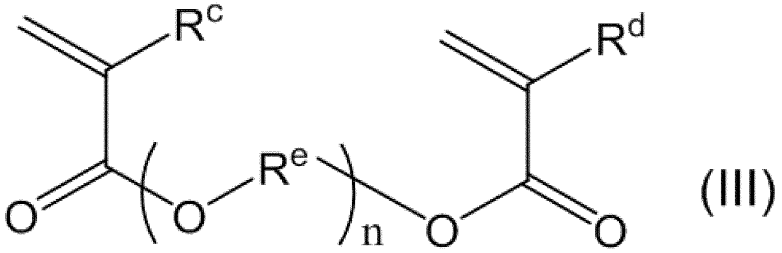
(II)

wherein R^{b} represents a hydrogen atom or a linear or branched alkyl group

having 1 to 5 carbon atoms.

3. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to Claim 1 or 2, wherein the mixture further contains a monomer having two or more carbon-carbon unsaturated bonds.

4. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to Claim 3, wherein the monomer having two or more carbon-carbon unsaturated bonds is a monomer represented by the following formula (III):



(III)

wherein R^c and R^d each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^e represents a linear or branched alkylene group having 1 to 5 carbon atoms, and n represents a number of 1 to 50.

5. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to any one of Claims 1 to 4, wherein a molar ratio of a unit derived from the monomer represented by the formula (I)/a unit derived from a monomer derived from the formula (II) in the polymer is 100/0 to 50/50.

6. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to any one of Claims 1 to 5, wherein a weight average molecular weight (Mn) of the polymer is 20,000 to 1,000,000, and a ratio (Mw/Mn) of the weight average molecular weight (Mw) and the number average molecular weight (Mn) of the polymer is 1.01 to 10.00.

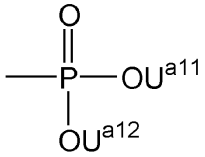
7. The method for producing the base film for producing cell aggregates ~~the polymer~~ according to any one of Claims 1 to 6, which is ~~a polymer used as a base film for cell culture~~ for obtaining cell aggregates by adhering cells and then detaching them.

~~8. A method for producing a base film-forming agent for cell culture, which~~

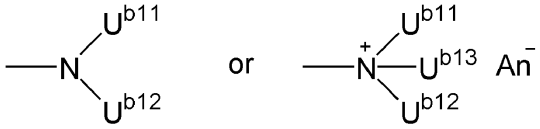
~~comprises a step of mixing the polymer obtained by the producing method according to any one of Claims 1 to 7 and a water-containing solution.~~

~~9. A method for producing a base film for cell culture, which comprises a step of coating the base film-forming agent for cell culture obtained by the producing method according to Claim 8 onto a surface of a container or a substrate and drying the same.~~

8~~10~~. The method for producing the base film for producing cell aggregates ~~a base film for cell culture~~ according to Claim 1~~9~~, which further comprises, before the coating and drying steps, a step of coating a composition for forming a coating film containing a copolymer having a recurring unit containing an organic group represented by the following formula (a) and a recurring unit containing an organic group represented by the following formula (b):



(a)



(b)

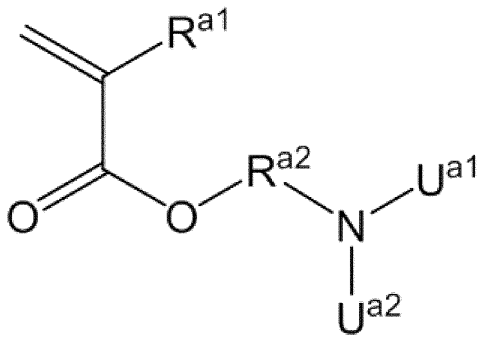
wherein U^{a11}, U^{a12}, U^{b11}, U^{b12} and U^{b13} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and An^- represents an anion selected from the group consisting of a halide ion, an inorganic acid ion, a hydroxide ion and an isothiocyanate ion,

and a solvent onto a surface of a container or a substrate and drying the same.

9~~11~~. The method for producing the base film for producing cell aggregates ~~a base film for cell culture~~ according to any one of Claims 1 to 8~~Claim 9~~, wherein the container or the substrate has a cell-adhesion inhibiting ability.

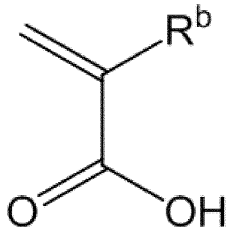
10~~12~~. A method for manufacturing a cell culture container, comprising:~~which comprises~~

a step of producing a polymer used as a base film for cell culture, which comprises a preparation step of preparing a mixture containing a monomer represented by the following formula (I):



(I)

wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms, and further a monomer represented by the formula (II):



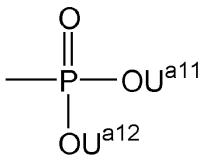
(II)

wherein R^{b} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms,

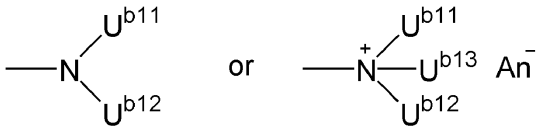
a radical polymerization initiator and an organic solvent, and a polymerization step of preparing a polymer by raising a temperature of the mixture under stirring to polymerize the monomers, and then

a step of coating a~~the~~ base film-forming agent for cell culture containing the polymer obtained by the above~~producing method according to Claim 8~~ onto a surface of a container or a substrate and drying the same.

11~~13~~. The method for manufacturing a cell culture container according to Claim 10~~12~~, which further comprises, before the coating and drying step, a step of coating a composition for forming a coating film containing a copolymer having a recurring unit containing an organic group represented by the following formula (a) and a recurring unit containing an organic group represented by the following formula (b):



(a)



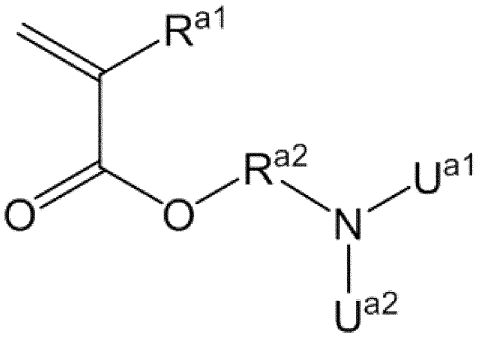
(b)

wherein U^{a11}, U^{a12}, U^{b11}, U^{b12} and U^{b13} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, An^- represents an anion selected from the group consisting of a halide ion, an inorganic acid ion, a hydroxide ion and an isothiocyanate ion,

and a solvent onto a surface of a container or a substrate and drying the same.

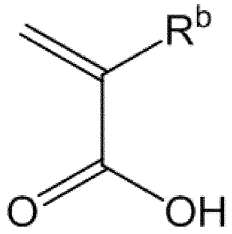
12~~14~~. The method for manufacturing a cell culture container according to Claim 10~~12~~, wherein the container or the substrate has a cell-adhesion inhibiting ability.

13. A method for producing a polymer used as a base film for cell culture which comprises a preparation step of preparing a mixture containing a monomer represented by the following formula (I):



(I)

wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms, and further a monomer represented by the formula (II):

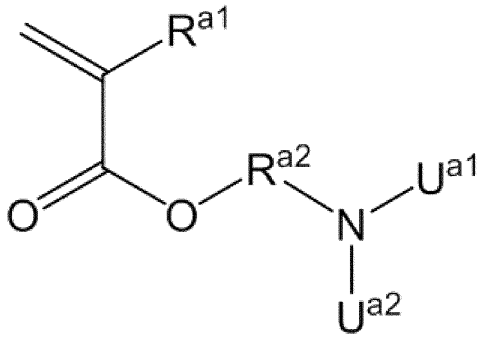


(II)

wherein R^b represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms,

a radical polymerization initiator and an organic solvent, an a polymerization step of preparing a polymer by raising a temperature of the mixture under stirring to polymerize the monomers.

14. A base film for cell culture which comprises a polymer, the polymer consisting of a unit derived from a monomer represented by the following formula (I):



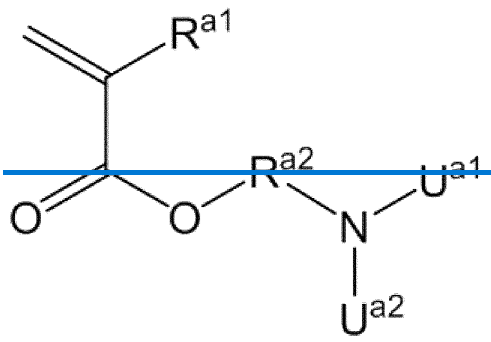
(I)

wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms.

15. The base film according to Claim 14, for producing cell aggregates.

16. A cell culture container, in which the base film according to Claim 14 or 15 is provided on a surface of the container.

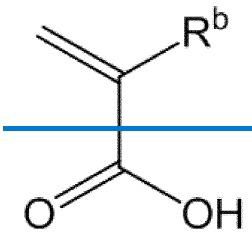
~~15. A method for producing cell aggregates, which comprises using a polymer having a unit derived from a monomer represented by the following formula (I):~~



(I)

~~wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms,~~ ~~as a base film for cell culture.~~

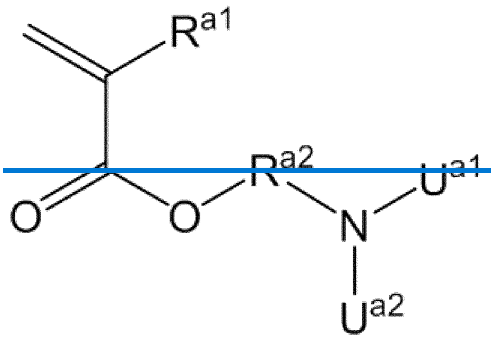
~~16. The method for producing cell aggregates according to Claim 15, wherein the polymer is a copolymer further having a unit derived from a monomer represented by the formula (II):~~



(II)

~~wherein R^b represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms.~~

~~17. Use of a polymer having a unit derived from a monomer represented by the following formula (I):~~

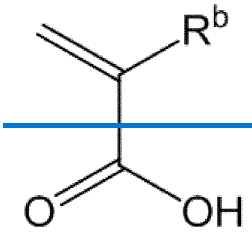


(I)

wherein U^{a1} and U^{a2} each independently represent a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, R^{a1} represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms, and R^{a2} represents a linear or branched alkylene group having 1 to 5 carbon atoms,

as a base film for cell culture for obtaining cell aggregates by adhering cells and then detaching them.

18. Use of the polymer as a base film for cell culture for obtaining cell aggregates by adhering cells and then detaching them according to Claim 17, wherein the polymer is a copolymer having units derived from monomers represented by the formula (I) as mentioned in the above and the formula (II):



(II)

wherein R^b represents a hydrogen atom or a linear or branched alkyl group having 1 to 5 carbon atoms.