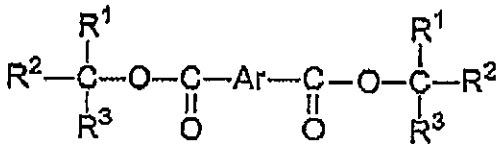
CLAIMS

1. A method for producing a polyester, comprising conducting a transesterification reaction of at least one compound selected from the group consisting of a compound represented by the following formula (1), a compound represented by the following formula (2) and a compound represented by the following formula (3) with a diol compound in the presence of a catalyst:

[Chem. 1]



(1)

wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group,

R^1 is a group represented by $CX^1Y^1R^4$, and two R^1s may be the same or different from each other,

R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$, and two R^2s may be the same or different from each other,

R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$, and two R^3s may be the same or different from each other,

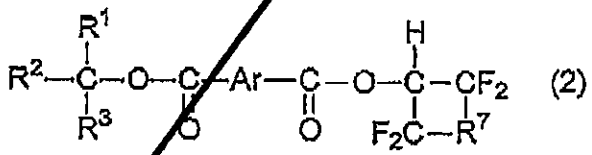
X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,

Y^1 to Y^3 are each independently a fluorine atom or R^f,

R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and

R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms;

[Chem. 2]



(2)

wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group,

R^1 is a group represented by $CX^1Y^1R^4$,

R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$,

R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$,

R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms,

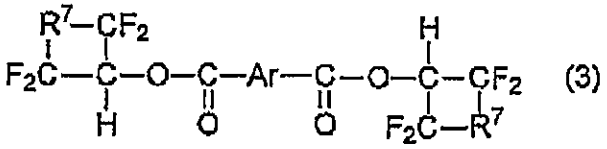
X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,

Y^1 to Y^3 are each independently a fluorine atom or R^f,

R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and

R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms; and

[Chem. 3]



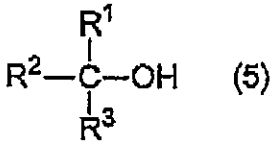
(3)

wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group, and

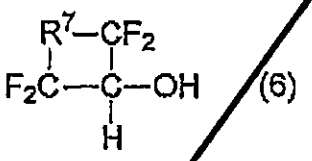
R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms, and two R^7s may be the same or different from each other.

2. The method for producing a polyester according to claim 1, wherein the compound represented by the above formula (1) to (3) is obtained by a reaction using as a starting material at least one fluorine-containing alcohol selected from the group consisting of a compound represented by the following formula (5) and a compound represented by the following formula (6):

[Chem. 4]



(5)



(6)

wherein R^1 is a group represented by $CX^1Y^1R^4$,

R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$,

R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$,

R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms,

X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,

Y^1 to Y^3 are each independently a fluorine atom or R^f,

R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and

R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms.

3. The method for producing a polyester according to claim 2, wherein the fluorine-containing alcohol has 2 to 10 carbon atoms.

4. The method for producing a polyester according to claim 2 or 3, wherein R^2 in formula (5) is a group represented by $CX^2Y^2R^5$.

5. The method for producing a polyester according to any one of claims 2 to 4, wherein the fluorine-containing alcohol has a pKa of less than 15.

6. The method for producing a polyester according to any one of claims 2 to 5, wherein the fluorine-containing alcohol has a pKa of less than 13.

7. The method for producing a polyester according to any one of claims 2 to 6, wherein the fluorine-containing alcohol is at least one selected from the group consisting of 2,2,2-trifluoroethanol, 2,2,3,3-tetrafluoro-1-propanol, 2,2,3,3,3-pentafluoro-1-propanol, 1,1,1,3,3,3-hexafluoro-2-propanol, 2-fluoro-1-propanol, 2,2,3,4,4,4-hexafluoro-1-butanol, 2,2,3,3,4,4,5,5-octafluoro-1-pentanol, 2,2,3,3,4,4,5,5-octafluorocyclopentanol, perfluoro(t-butyl) alcohol, and 2,2,3,3,4,4,5,5,6,6-decafluorocyclohexanol.

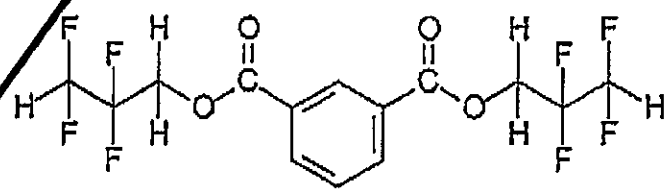
8. The method for producing a polyester according to any one of claims 1 to 7, wherein the diol compound is an aromatic diol compound.

9. The method for producing a polyester according to any one of claims 1 to 8, wherein the diol compound is bisphenol A.

10. The method for producing a polyester according to any one of claims 1 to 9, wherein the catalyst is an alkali metal salt or an alkali earth metal salt.

11. Bis(2,2,3,3-tetrafluoropropyl) isophthalate represented by the following formula (1-1):

[Chem. 5]

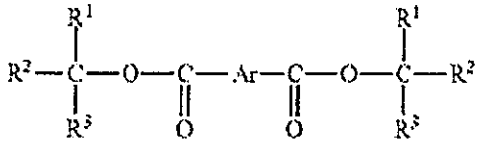


(1-1)

CLAIMS

1. A method for producing a polyester, comprising conducting a transesterification reaction of at least one compound selected from the group consisting of a compound represented by the following formula (1), a compound represented by the following formula (2) and a compound represented by the following formula (3) with a diol compound in the presence of a catalyst:

[Chem. 1]



(1)

wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group,

R^1 is a group represented by $CX^1Y^1R^4$, and two R^1s may be the same or different from each other,

R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$, and two R^2s may be the same or different from each other,

R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$, and two R^3s may be the same or different from each other,

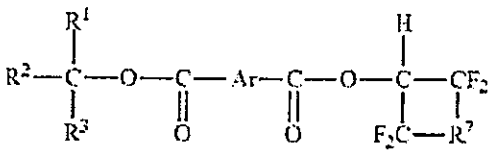
X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,

Y^1 to Y^3 are each independently a fluorine atom or R^f,

R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and

R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms;

[Chem. 2]



(2)

wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group,

R^1 is a group represented by $CX^1Y^1R^4$,

R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$,

R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$,

R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms,

X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,

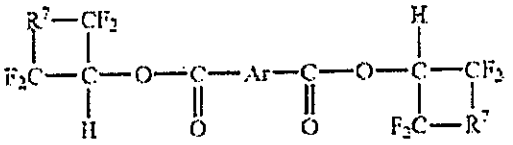
Y^1 to Y^3 are each independently a fluorine atom or R^f,

R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and

R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms; and

[Chem. 3]

(3)



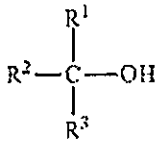
wherein Ar is a divalent aromatic hydrocarbon group or a divalent aromatic heterocyclic group, and

R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms, and two R^7s may be the same or different from each other.

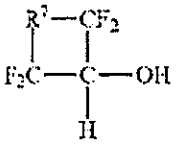
2. The method for producing a polyester according to claim 1, wherein the compound represented by the above formula (1) to (3) is obtained by a reaction using as a starting material at least one fluorine-containing alcohol selected from the group consisting of a compound represented by the following formula (5) and a compound represented by the following formula (6):

[Chem. 4]

(5)



(6)



wherein R^1 is a group represented by $CX^1Y^1R^4$,
R^2 is a hydrogen atom or a group represented by $CX^2Y^2R^5$,
R^3 is a hydrogen atom or a group represented by $CX^3Y^3R^6$,
R^7 is a perfluoroalkylene group (which may contain an etheric oxygen) having 1 to 5 carbon atoms,
X^1 to X^3 are each independently a hydrogen atom, a fluorine atom or R^f,
Y^1 to Y^3 are each independently a fluorine atom or R^f,
R^4 to R^6 are each independently a fluorine atom, R^f, OR^f or an alkyl group having 1 to 6 carbon atoms, and
R^f is independently a fluoroalkyl group (which may contain an etheric oxygen) having 1 to 4 carbon atoms.

3. The method for producing a polyester according to claim 2, wherein the fluorine-containing alcohol has 2 to 10 carbon atoms.

4. The method for producing a polyester according to claim 2, wherein R^2 in formula (5) is a group represented by $CX^2Y^2R^5$.

5. The method for producing a polyester according to claim 2, wherein the fluorine-containing alcohol has a pKa of less than 15.

6. The method for producing a polyester according to claim 2, wherein the fluorine-containing alcohol has a pKa of less than 13.

7. The method for producing a polyester according to claim 2, wherein the fluorine-containing alcohol is at least one selected from the group consisting of 2,2,2-trifluoroethanol, 2,2,3,3-tetrafluoro-1-propanol, 2,2,3,3,3-pentafluoro-1-propanol, 1,1,1,3,3,3-hexafluoro-2-propanol, 2-fluoro-1-propanol, 2,2,3,4,4,4-hexafluoro-1-butanol, 2,2,3,3,4,4,5,5-octafluoro-1-pentanol, 2,2,3,3,4,4,5,5-octafluorocyclopentanol, perfluoro(t-butyl) alcohol, and 2,2,3,3,4,4,5,5,6,6-decafluorocyclohexanol.

8. The method for producing a polyester according to claim 1, wherein the diol compound is an aromatic diol compound.

9. The method for producing a polyester according to claim 1, wherein the diol compound is bisphenol A.

10. The method for producing a polyester according to claim 1, wherein the catalyst is an alkali metal salt or an alkali earth metal salt.

11. Bis(2,2,3,3-tetrafluoropropyl)isophthalate represented by the following formula (1-1):

[Chem. 5]

(1-1)

