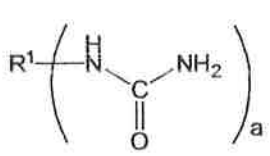
[Claims]

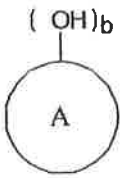
[Claim 1]

A method for producing at least one N-substituted carbamic acid-O-aryl ester (wherein the N-substituted carbamic acid-O-aryl ester referrs to an N-substituted carbamic acid ester in which oxygen atoms of the carbamic acid group (-NHCOO-) are bonded to an aromatic ring) derived from a compound having an ureido group represented by the following formula (1) and an aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2), the method comprising the step of carrying out esterification or esterification and transesterification from the compound having the ureido group and the aromatic hydroxy composition:

[Chemical Formula 1]



(1)



(2)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number a of ureido group(s), and the a represents an integer of from 1 to 10, and

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain

aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, wherein if the ring A is substituted by said other substituents, said other substitutents are at least one substitutent selected from groups (iv) and (v) below,

(iv) a halogen atom, and

(v) a group composed of atoms selected from carbon atoms, hydrogen atoms, oxygen atoms, nitrogen atoms, sulfur atoms and halogen atoms (but excluding a carbonyl group, an ester group, a terminal methine group and an alcoholic OH group, a carboxyl group, a NH_2 group, a NH group, a NOH group, a SH group, a SO_3H group and a SOH group),

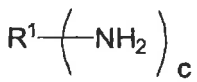
and the b represents an integer of from 1 to 6).

[Claim 2]

The production method according to Claim 1, wherein the compound having the ureido group is a compound having an ureido group obtained by a process comprising the following step A:

step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction:

[Chemical Formula 2]



(3)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of from 1 to 10).

[Claim 3]

The production method according to Claim 2, wherein the organic primary amine is an organic primary monoamine or an organic primary diamine.

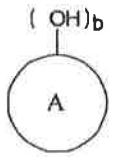
[Claim 4]

The production method according to Claim 2, wherein the step (A) is carried out in the presence of water and/or alcohol and/or an aromatic hydroxyl composition containing at least one type of aromatic hydroxyl compound.

[Claim 5]

The production method according to Claim 2, wherein the step (A) is carried out in the presence of an aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2):

[Chemical Formula 3]



(2)

(wherein

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at an arbitrary location(s) that maintain aromatic properties, which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of from 1 to 6).

[Claim 6]

The production method according to Claim 2, wherein the step (A) is carried out in the presence of an alcohol represented by the following formula (4):

[Chemical Formula 4]

$$R^2OH \quad (4)$$

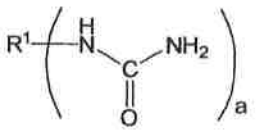
(wherein

R^2 represents an aliphatic group, or an aliphatic group in which an aromatic group is bonded, which contains an integral number of carbon atoms within a range of from 1 to 14, and the OH group of the alcohol represented by formula (4) is an OH group that is not bonded to an aromatic ring).

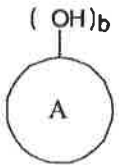
[Claim 7]

A composition for transfer and storage of a compound having an ureido group, wherein the number of molecules of at least one type of aromatic hydroxy compound represented by the following formula (2) in an aromatic hydroxy composition that contains the aromatic hydroxy compound, based on the number of the ureido group contained in the compound having the ureido group represented by the following formula (1) in the composition, is an integer of from 1 to 100:

[Chemical Formula 5]



(1)



(2)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number a of ureido group(s), and the a represents an integer of from 1 to 10), and

ring A represents an organic group, which contains an aromatic group

substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, wherein if the ring A is substituted by said other substituents, said other substitutents are at least one substitutent selected from groups (iv) and (v) below,

(iv) a halogen atom, and

(v) a group composed of atoms selected from carbon atoms, hydrogen atoms, oxygen atoms, nitrogen atoms, sulfur atoms and halogen atoms (but excluding a carbonyl group, an ester group, a terminal methine group and an alcoholic OH group, a carboxyl group, a NH_2 group, a NH group, a NOH group, a SH group, a SO_3H group and a SOH group),

and the b represents an integer of from 1 to 6).

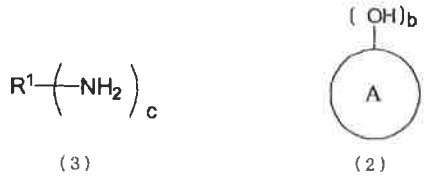
[Claim 8]

The production method according to Claim 1, further comprising the following steps (A) and (B):

step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction, and

step (B): a step of obtaining N-substituted carbamic acid-O-aryl ester by reacting the at least one type of compound having the ureido group and the aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2) in a liquid phase, and extracting ammonia formed as a by-product to a gaseous phase:

[Chemical Formula 6]



(3) (2)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of 1 to 10, and

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of 1 to 6).

[Claim 9]

The production method according to Claim 1, further comprising the following steps (A), (R) and (P):

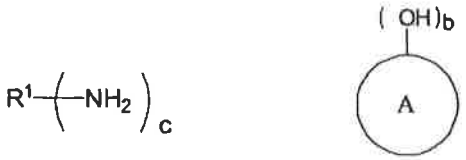
step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction,

step (R): a step of obtaining N-substituted carbamic acid-O-R^2 ester by reacting the at least one type of compound having the ureido group and an alcohol represented by the following formula (4) in a liquid phase and extracting ammonia formed as a by-product to a gaseous phase (wherein the N-substituted carbamic acid-O-R^2 ester represents an N-substituted carbamic acid ester in which oxygen

atoms of the carbamic acid group (-NHCOO-) are bonded to an R^2 group derived from an alcohol), and

step (P): a step of obtaining N-substituted carbamic acid-O-aryl ester by reacting the N-substituted carbamic acid-O-R^2 ester and the aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2) in a liquid phase and extracting alcohol formed as a by-product to a gaseous phase:

[Chemical Formula 7]



(3)

(2)

R^2OH (4)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of from 1 to 10,

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of from 1 to 6, and

R^2 represents an aliphatic group, or an aliphatic group in which an aromatic group is bonded, which contains an integral number of carbon atoms within a range of from 1 to 14, and the OH group of the alcohol represented by formula (4) is an OH group that is not bonded to an aromatic ring).

[Claim 10]

The production method according to Claim 8 or 9, wherein the organic primary amine is at least one aromatic organic primary monoamine selected from the group consisting of aniline, aminotoluene (including isomers), dimethylaniline (including isomers), diethylaniline (including isomers), dipropylaniline (including isomers), aminonaphthalene (including isomers), aminomethylnaphthalene (including isomers), dimethylnaphthylamine (including isomers) and trimethylnaphthylamine (including isomers), the following step (C) is carried out after the step (B), after the step (R) or after the step (P), and N-substituted carbamic acid-O-(R^2 or aryl) ester, in which at least two molecules of the N-substituted carbamic acid-O-(R^2 or aryl) ester are crosslinked with a methylene group ($-CH_2-$), is obtained from the N-substituted carbamic acid-O-(R^2 or aryl) ester obtained in the step (B), the step (R) or the step (P):

step (C): a step of obtaining N-substituted carbamic acid-O-(R^2 or aryl) ester, in which at least two molecules of the N-substituted carbamic acid-O-(R^2 or aryl) ester are crosslinked with a methylene group ($-CH_2-$), by reacting the N-substituted carbamic acid-O-(R^2 or aryl) ester with formaldehyde or a methylenating crosslinking agent and crosslinking aromatic groups derived from the aromatic organic primary monoamine contained in the N-substituted carbamic acid-O-(R^2 or aryl) ester with the methylene group ($-CH_2-$) (wherein the N-substituted carbamic acid-O-(R^2 or aryl) ester represents an N-substituted carbamic acid-O-R^2 ester or an N-substituted carbamic acid-O-aryl ester).

[Claim 11]

The production method according to Claim 8 or 9, comprising the step of recovering urea by carrying out the following step (D) before the step (B) or the step (P) and/or simultaneous to the step (B) or the step (P):

step (D): a step of removing urea by distillation or sublimation.

[Claim 12]

The production method according to Claim 8 or 9, comprising the following step (E) of recycling the recovered urea to the step (A):

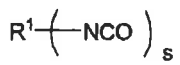
step (E): a step of recycling urea recovered in step (D) to step (A).

[Claim 13]

The production method according to Claim 1, comprising the step of obtaining an isocyanate represented by the following formula (6), which is derived from the N-substituted carbamic acid-O-aryl ester, and an aromatic hydroxy composition by carrying out thermal decomposition on the N-substituted carbamic acid-O-aryl ester in the following step (F):

step (F): a step of obtaining an isocyanate and an aromatic hydroxy composition from the N-substituted carbamic acid-O-aryl ester:

[Chemical Formula 9]



(6)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number s of NCO group(s), and the s represents an integer of from 1 to 10).

[Claim 14]

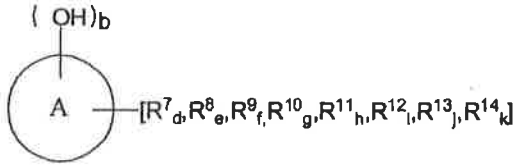
The production method according to Claim 8 or 9, comprising the step of separating the aromatic hydroxy composition obtained in the step (F) from the isocyanate, and recycling the aromatic hydroxy composition to the step (A) and/or the step (B), or to the step (A) and/or the step (R) and/or the step (P).

[Claim 15]

The production method according to any one of Claims 1, 8 and 9, wherein an

aromatic hydroxy compound that composes the aromatic hydroxy composition is at least one type of aromatic hydroxy compound represented by the following formula (7):

[Chemical Formula 10]



(7)

(wherein

ring A represents an aromatic ring selected from a benzene ring, a naphthalene ring and an anthracene ring, the OH groups and groups R^7 to R^{14} respectively represent groups substituted at arbitrary location(s) that maintain aromatic properties of ring A, groups R^7 to R^{14} may respectively and independently substitute ring A, groups R^7 to R^{14} may bond together to form a ring with an aromatic ring by bonding to ring A, groups R^7 to R^{14} respectively and independently represent a hydrogen atom, a halogen atom or a group selected from the group consisting of an alkyl group, an cycloalkyl group, an aryl group, an aryl group having a hydroxy group, an aralkyl group and an ether group (substituted and/or unsubstituted alkyl ether and/or substituted and/or unsubstituted aryl ether and/or substituted and/or unsubstituted aralkyl ether group), and ring A and groups R^7 to R^{14} are composed of an integral total number of carbon atoms within a range of from 6 to 50,

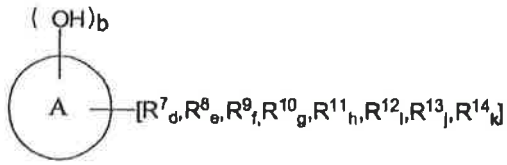
b represents an integer of from 1 to 6, d, e, f, g, h, i, j and k represent integers of from 0 to 5, the value of d + e + f + g + h + i + j + k represents an integer equal to 6-b in the case ring A is the benzene ring, represents an integer equal to 8-b in the case ring A is the naphthalene ring, or represents an integer equal to 10-b in the case ring A is the anthracene ring, and a group selected from groups R^7 to R^{14} as described above

may be cyclically bonded to ring A by carbon-carbon bonds and/or ether bonds).

[Claim 16]

The composition for transfer and storage of the compound having the ureido group according to Claim 7, wherein the aromatic hydroxy compound that composes the aromatic hydroxy composition is at least one type of aromatic hydroxy compound represented by the following formula (7):

[Chemical Formula 11]



(7)

(wherein

ring A represents an aromatic ring selected from a benzene ring, a naphthalene ring and an anthracene ring, the OH groups and groups R^7 to R^{14} respectively represent groups substituted at arbitrary location(s) that maintain aromatic properties of ring A, groups R^7 to R^{14} may respectively and independently substitute ring A, groups R^7 to R^{14} may bond together to form a ring with an aromatic ring by bonding to ring A, groups R^7 to R^{14} respectively and independently represent a hydrogen atom, halogen atom or group selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group, an aryl group having a hydroxy group, an aralkyl group and an ether group (substituted and/or unsubstituted alkyl ether and/or substituted and/or unsubstituted aryl ether and/or substituted and/or unsubstituted aralkyl ether group), and ring A and groups R^7 to R^{14} are composed of an integral total number of carbon atoms within a range of from 6 to 50,

b represents an integer of from 1 to 6, d, e, f, g, h, i, j and k represent integers of from 0 to 5, the value of d + e + f + g + h + i + j + k represents an integer equal to 6-b in

the case ring A is the benzene ring, represents an integer equal to 8-b in the case ring A is the naphthalene ring, or represents an integer equal to 10-b in the case ring A is the anthracene ring, and a group selected from groups R^7 to R^{14} as described above may be cyclically bonded to ring A by carbon-carbon bonds and/or ether bonds).

[Claim 17]

The production method according to any one of Claims 2, 8 and 9, wherein the aromatic hydroxy compound that composes the aromatic hydroxy composition has a standard boiling point that differs by 10°C or more from the standard boiling point of an isocyanate having a structure in which all amino groups of the organic primary amine (primary amino groups) are converted to isocyanate groups.

[Claim 18]

The production method according to any one of Claims 1, 8 and 9, wherein the aromatic hydroxy compound contained in the aromatic hydroxy composition is a monovalent and/or divalent aromatic hydroxy compound (namely, that in which b is 1 and/or 2).

[Claim 19]

The composition for transfer and storage of the compound having the ureido group according to Claim 7, wherein the aromatic hydroxy compound contained in the aromatic hydroxy composition is a monovalent and/or divalent aromatic hydroxy compound (namely, that in which b is 1 and/or 2).

[Claim 20]

The production method according to Claim 18, comprising recycling unreacted N-substituted carbamic acid-O-aryl ester that has not been thermally decomposed in the step (F), to the step (A) and/or the step (B) and/or the step (R) and/or the step (P) and/or the step (F).

[Claim 21]

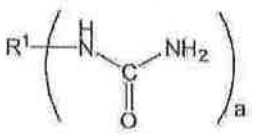
The production method according to Claim 8 or 9, further comprising the following step (G) of recovering ammonia formed as a by-product in the step (A) and/or the step (B) and/or the step (R); regenerating urea by reacting the ammonia with carbon dioxide; and recycling the urea to the step (A):

step (G): a step of recovering ammonia formed as a by-product, regenerating urea by reacting the ammonia with carbon dioxide, and recycling the urea to step (A).

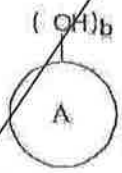
CLAIMS

I (We) claim:

1. A method for producing at least one N-substituted carbamic acid-O-aryl ester (wherein the N-substituted carbamic acid-O-aryl ester referrs to an N-substituted carbamic acid ester in which oxygen atoms of the carbamic acid group (-NHCOO-) are bonded to an aromatic ring) derived from a compound having an ureido group represented by the following formula (1) and an aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2), the method comprising the step of carrying out esterification or esterification and transesterification from the compound having the ureido group and the aromatic hydroxy composition:



(1)



(2)

(wherein

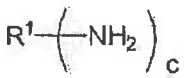
R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number a of ureido group(s), and the a represents an integer of from 1 to 10, and

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the the b represents an integer of from 1 to 6).

2. The production method according to Claim 1, wherein the compound

having the ureido group is a compound having an ureido group obtained by a process comprising the following step A:

step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction:



(3)

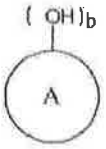
(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of from 1 to 10).

3. The production method according to Claim 2, wherein the organic primary amine is an organic primary monoamine or an organic primary diamine.

4. The production method according to Claim 2, wherein the step (A) is carried out in the presence of water and/or alcohol and/or an aromatic hydroxyl composition containing at least one type of aromatic hydroxyl compound.

5. The production method according to Claim 2, wherein the step (A) is carried out in the presence of an aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2):



(2)

(wherein

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at an arbitrary location(s) that maintain aromatic properties, which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of from 1 to 6).

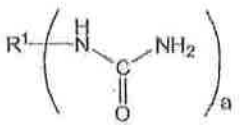
6. The production method according to Claim 2, wherein the step (A) is carried out in the presence of an alcohol represented by the following formula (4):

R^2OH (4)

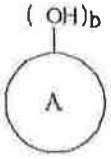
(wherein

R^2 represents an aliphatic group, or an aliphatic group in which an aromatic group is bonded, which contains an integral number of carbon atoms within a range of from 1 to 14, and the OH group of the alcohol represented by formula (4) is an OH group that is not bonded to an aromatic ring).

7. A composition for transfer and storage of a compound having an ureido group, wherein the number of molecules of at least one type of aromatic hydroxy compound represented by the following formula (2) in an aromatic hydroxy composition that contains the aromatic hydroxy compound, based on the number of the ureido group contained in the compound having the ureido group represented by the following formula (1) in the composition, is an integer of from 1 to 100:



(1)



(2)

(wherein

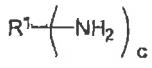
R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number a of ureido group(s), and the a represents an integer of from 1 to 10), and

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of from 1 to 6).

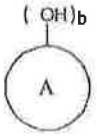
8. The production method according to Claim 1, further comprising the following steps (A) and (B):

step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction, and

step (B): a step of obtaining N-substituted carbamic acid-O-aryl ester by reacting the at least one type of compound having the ureido group and the aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2) in a liquid phase, and extracting ammonia formed as a by-product to a gaseous phase:



(3)



(2)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of 1 to 10, and

ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of 1 to 6).

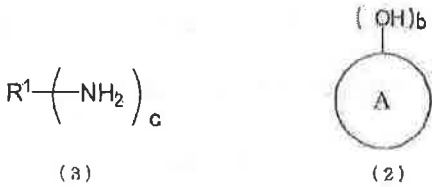
9. The production method according to Claim 1, further comprising the following steps (A), (R) and (P):

step (A): a step of obtaining at least one type of compound having an ureido group derived from an organic primary amine represented by the following formula (3) and urea by ureidating the organic primary amine and the urea in a liquid phase and eliminating or extracting to a gaseous phase ammonia formed as a by-product in the ureidation reaction,

step (R): a step of obtaining N-substituted carbamic acid-O-R^2 ester by reacting the at least one type of compound having the ureido group and an alcohol represented by the following formula (4) in a liquid phase and extracting ammonia formed as a by-product to a gaseous phase (wherein the N-substituted carbamic acid-O-R^2 ester represents an N-substituted carbamic acid ester in which oxygen atoms of the carbamic acid group (-NHCOO-) are bonded to an R^2 group derived from

an alcohol), and

step (P): a step of obtaining N-substituted carbamic acid-O-aryl ester by reacting the N-substituted carbamic acid-O-R^2 ester and the aromatic hydroxy composition containing at least one type of aromatic hydroxy compound represented by the following formula (2) in a liquid phase and extracting alcohol formed as a by-product to a gaseous phase:



(3) (2)

R^2OH (4)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number c of NH_2 group(s), and the c represents an integer of from 1 to 10,

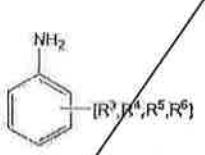
ring A represents an organic group, which contains an aromatic group substituted by number b of hydroxy group(s) at arbitrary location(s) that maintain aromatic properties, and which contains an integral number of carbon atoms within a range of from 6 to 50, may be a single or multiple heterocyclic ring, and may be substituted by other substituents, and the b represents an integer of from 1 to 6, and

R^2 represents an aliphatic group, or an aliphatic group in which an aromatic group is bonded, which contains an integral number of carbon atoms within a range of from 1 to 14, and the OH group of the alcohol represented by formula (4) is an OH group that is not bonded to an aromatic ring).

10. The production method according to Claim 8 or 9, wherein the organic

primary amine is an aromatic organic primary monoamine represented by the following formula (5), the following step (C) is carried out after the step (B), after the step (R) or after the step (P), and N-substituted carbamic acid-O-(R^2 or aryl) ester, in which at least two molecules of the N-substituted carbamic acid-O-(R^2 or aryl) ester are crosslinked with a methylene group ($-CH_2-$), is obtained from the N-substituted carbamic acid-O-(R^2 or aryl) ester obtained in the step (B), the step (R) or the step (P):

step (C): a step of obtaining N-substituted carbamic acid-O-(R^2 or aryl) ester, in which at least two molecules of the N-substituted carbamic acid-O-(R^2 or aryl) ester are crosslinked with a methylene group ($-CH_2-$), by reacting the N-substituted carbamic acid-O-(R^2 or aryl) ester with formaldehyde or a methylenating crosslinking agent and crosslinking aromatic groups derived from the aromatic organic primary monoamine contained in the N-substituted carbamic acid-O-(R^2 or aryl) ester with the methylene group ($-CH_2-$) (wherein the N-substituted carbamic acid-O-(R^2 or aryl) ester represents an N-substituted carbamic acid-O-R^2 ester or an N-substituted carbamic acid-O-aryl ester):



(5)

(wherein

at least one location at the ortho position and/or para position of the NH_2 group of an aromatic organic primary monoamine represented by formula (5) is not substituted, groups R^3 to R^6 respectively represent a group substituted at an arbitrary location that maintains aromatic properties of the ring, groups R^3 to R^6 may respectively and independently substitute an aromatic ring or groups R^3 to R^6 may together bond to form a ring with an aromatic ring, groups R^3 to R^6 are hydrogen atoms or groups selected from the group consisting of groups in which a group

selected from the group consisting of an alkyl group, an cycloalkyl group, an aryl group and an aryl group having a hydroxy group is bonded by saturated aliphatic bonds and/or ether bonds, the number of carbon atoms of groups R^3 to R^6 is an integral number within a range of 0 to 7, and a total number of carbon atoms that compose the aromatic organic primary monoamine represented by formula (5) is an integer of from 6 to 13).

11. The production method according to Claim 8 or 9, comprising the step of recovering urea by carrying out the following step (D) before the step (B) or the step (P) and/or simultaneous to the step (B) or the step (P):

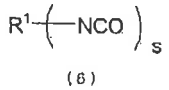
step (D): a step of removing urea by distillation or sublimation.

12. The production method according to Claim 8 or 9, comprising the following step (E) of recycling the recovered urea to the step (A):

step (E): a step of recycling urea recovered in step (D) to step (A).

13. The production method according to Claim 1, comprising the step of obtaining an isocyanate represented by the following formula (6), which is derived from the N-substituted carbamic acid-O-aryl ester, and an aromatic hydroxy composition by carrying out thermal decomposition on the N-substituted carbamic acid-O-aryl ester in the following step (F):

step (F): a step of obtaining an isocyanate and an aromatic hydroxy composition from the N-substituted carbamic acid-O-aryl ester:



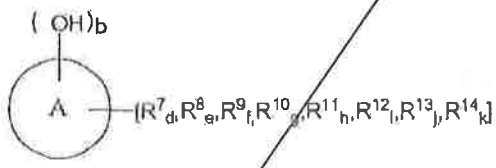
(6)

(wherein

R^1 represents an organic group containing an integral number of carbon atoms within a range of from 1 to 85, that is substituted by number s of NCO group(s), and the s represents an integer of from 1 to 10).

14. The production method according to Claim 8 or 9, comprising the step of separating the aromatic hydroxy composition obtained in the step (F) from the isocyanate, and recycling the aromatic hydroxy composition to the step (A) and/or the step (B), or to the step (A) and/or the step (R) and/or the step (P).

15. The production method according to any one of Claims 1, 8 and 9, wherein an aromatic hydroxy compound that composes the aromatic hydroxy composition is at least one type of aromatic hydroxy compound represented by the following formula (7):



(7)

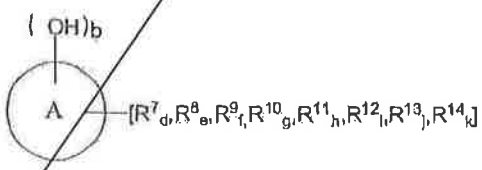
(wherein

ring A represents an aromatic ring selected from a benzene ring, a naphthalene ring and an anthracene ring, the OH groups and groups R^7 to R^{14} respectively represent groups substituted at arbitrary location(s) that maintain aromatic properties of ring A, groups R^7 to R^{14} may respectively and independently substitute ring A, groups R^7 to R^{14} may bond together to form a ring with an aromatic ring by bonding to ring A, groups R^7 to R^{14} respectively and independently represent a hydrogen atom, a halogen atom or a group selected from the group consisting of an alkyl group, an cycloalkyl group, an aryl group, an aryl group having a hydroxy group, an aralkyl

group and an ether group (substituted and/or unsubstituted alkyl ether and/or substituted and/or unsubstituted aryl ether and/or substituted and/or unsubstituted aralkyl ether group), and/or a group to which one or more types of groups selected from the group are bonded, and/or a group to which one or more types of groups selected from the group are bonded by saturated aliphatic bonds and/or ether bonds, and ring A and groups R^7 to R^{14} are composed of an integral total number of carbon atoms within a range of from 6 to 50,

b represents an integer of from 1 to 6, d, e, f, g, h, i, j and k represent integers of from 0 to 5, the value of d + e + f + g + h + i + j + k represents an integer equal to 6-b in the case ring A is the benzene ring, represents an integer equal to 8-b in the case ring A is the naphthalene ring, or represents an integer equal to 10-b in the case ring A is the anthracene ring, and a group selected from groups R^7 to R^{14} as described above may be cyclically bonded to ring A by carbon-carbon bonds and/or ether bonds).

16. The composition for transfer and storage of the compound having the ureido group according to Claim 7, wherein the aromatic hydroxy compound that composes the aromatic hydroxy composition is at least one type of aromatic hydroxy compound represented by the following formula (7):



(7)

(wherein

ring A represents an aromatic ring selected from a benzene ring, a naphthalene ring and an anthracene ring, the OH groups and groups R^7 to R^{14} respectively represent groups substituted at arbitrary location(s) that maintain aromatic properties

of ring A, groups R^7 to R^{14} may respectively and independently substitute ring A, groups R^7 to R^{14} may bond together to form a ring with an aromatic ring by bonding to ring A, groups R^7 to R^{14} respectively and independently represent a hydrogen atom, halogen atom or group selected from the group consisting of an alkyl group, a cycloalkyl group, an aryl group, an aryl group having a hydroxy group, an aralkyl group and an ether group (substituted and/or unsubstituted alkyl ether and/or substituted and/or unsubstituted aryl ether and/or substituted and/or unsubstituted aralkyl ether group), and/or a group to which one or more types of groups selected from the group are bonded, and/or a group to which one or more types of groups selected from the group are bonded by saturated aliphatic bonds and/or ether bonds, and ring A and groups R^7 to R^{14} are composed of an integral total number of carbon atoms within a range of from 6 to 50,

b represents an integer of from 1 to 6, d, e, f, g, h, i, j and k represent integers of from 0 to 5, the value of d + e + f + g + h + i + j + k represents an integer equal to 6-b in the case ring A is the benzene ring, represents an integer equal to 8-b in the case ring A is the naphthalene ring, or represents an integer equal to 10-b in the case ring A is the anthracene ring, and a group selected from groups R^7 to R^{14} as described above may be cyclically bonded to ring A by carbon-carbon bonds and/or ether bonds).

17. The production method according to any one of Claims 2, 8 and 9, wherein the aromatic hydroxy compound that composes the aromatic hydroxy composition has a standard boiling point that differs by 10°C or more from the standard boiling point of an isocyanate having a structure in which all amino groups of the organic primary amine (primary amino groups) are converted to isocyanate groups.

18. The production method according to any one of Claims 1, 8 and 9, wherein

the aromatic hydroxy compound contained in the aromatic hydroxy composition is a monovalent and/or divalent aromatic hydroxy compound (namely, that in which b is 1 and/or 2).

19. The composition for transfer and storage of the compound having the ureido group according to Claim 7, wherein the aromatic hydroxy compound contained in the aromatic hydroxy composition is a monovalent and/or divalent aromatic hydroxy compound (namely, that in which b is 1 and/or 2).

20. The production method according to Claim 18, comprising recycling unreacted N-substituted carbamic acid-O-aryl ester that has not been thermally decomposed in the step (F), to the step (A) and/or the step (B) and/or the step (R) and/or the step (P) and/or the step (F).

21. The production method according to Claim 8 or 9, further comprising the following step (G) of recovering ammonia formed as a by-product in the step (A) and/or the step (B) and/or the step (R); regenerating urea by reacting the ammonia with carbon dioxide; and recycling the urea to the step (A):

step (G): a step of recovering ammonia formed as a by-product, regenerating urea by reacting the ammonia with carbon dioxide, and recycling the urea to step (A).