

In the present specification, the "C₃₋₁₀ cycloalkenyl (group)" means, for example, cyclopropenyl (e.g., 2-cyclopropen-1-yl), cyclobutenyl (e.g., 2-cyclobuten-1-yl), cyclopentenyl (e.g., 2-cyclopenten-1-yl, 3-cyclopenten-1-yl), cyclohexenyl (e.g., 1-cyclohexen-1-yl, 2-cyclohexen-1-yl, 3-cyclohexen-1-yl), cycloheptenyl (e.g., 1-cyclohepten-1-yl, 2-cyclohepten-1-yl, 2-cyclohepten-1-yl), cyclooctenyl (e.g., 1-cycloocten-1-yl, 2-cycloocten-1-yl, 3-cycloocten-1-yl), cyclononenyl (e.g., 1-cyclononen-1-yl, 2-cyclononen-1-yl, 3-cyclononen-1-yl) or the like. Among them, a C₃₋₈ cycloalkenyl group is preferable.

In the present specification, the "C₃₋₈ cycloalkenyl (group)" means, for example, cyclopropenyl (e.g., 2-cyclopropen-1-yl), cyclobutenyl (e.g., 2-cyclobuten-1-yl), cyclopentenyl (e.g., 2-cyclopenten-1-yl, 3-cyclopenten-1-yl), cyclohexenyl (e.g., 2-cyclohexen-1-yl, 3-cyclohexen-1-yl) or the like.

In the present specification, the "C₃₋₈ cycloalkenyloxy (group)" means, for example, cyclopropenyloxy (e.g., 2-cyclopropen-1-yloxy), cyclobutenyloxy (e.g., 2-cyclobuten-1-yloxy), cyclopentenyloxy (e.g., 2-cyclopenten-1-yloxy, 3-cyclopenten-1-yloxy), cyclohexenyloxy (e.g., 2-cyclohexen-1-yloxy, 3-cyclohexen-1-yloxy) or the like.

In the present specification, the "C₄₋₁₀ cycloalkadienyl group" means, for example, 1,3-cyclobutadien-1-yl, 1,3-cyclopentadien-1-yl, 1,4-cyclopentadien-1-yl, 2,4-cyclopentadien-1-yl, 1,3-cyclohexadien-1-yl, 1,4-cyclohexadien-1-yl, 1,5-cyclohexadien-1-yl, 2,4-cyclohexadien-1-yl, 2,5-cyclohexadien-1-yl, 1,3-cyclooctadien-1-yl, 1,4-cyclooctadien-1-yl, 1,5-cyclooctadien-1-yl, 1,6-cyclooctadien-1-yl, 1,7-cyclooctadien-1-yl, 2,4-cyclooctadien-1-yl, 2,5-cyclooctadien-1-yl, 2,6-cyclooctadien-1-yl, 2,7-cyclooctadien-1-yl, 3,5-cyclooctadien-1-yl, 3,6-cyclooctadien-1-yl or the like. Among them, a C₄₋₆ cycloalkadienyl group is preferable.

In the present specification, the "C₄₋₆ cycloalkadienyl

- (69) a carboxy group;
- (70) a C₁₋₆ alkoxy-carbonyl group;
- (71) a C₂₋₆ alkenyloxy-carbonyl group (e.g., vinyloxycarbonyl, propenyloxycarbonyl, butenyloxycarbonyl, pentenyloxycarbonyl, hexenyloxycarbonyl);
- (72) a C₂₋₆ alkynyloxy-carbonyl group (e.g., ethynyloxycarbonyl, propynyloxycarbonyl, butynyloxycarbonyl, pentynyloxycarbonyl, hexynyloxycarbonyl);
- (73) a C₃₋₈ cycloalkyloxy-carbonyl group (e.g., cyclopropyloxycarbonyl, cyclobutyloxycarbonyl, cyclopentyloxycarbonyl, cyclohexyloxycarbonyl);
- (74) a C₃₋₈ cycloalkenyloxy-carbonyl group (e.g., cyclopropenyloxycarbonyl, cyclobutenyloxycarbonyl, cyclopentenylloxycarbonyl, cyclohexenyloxycarbonyl);
- (75) a C₆₋₁₄ aryloxy-carbonyl group (e.g., phenoxy-carbonyl, 1-naphthyloxycarbonyl, 2-naphthyloxycarbonyl);
- (76) a C₃₋₈ cycloalkyl-C₁₋₆ alkoxy-carbonyl group (e.g., cyclopropylmethyloxycarbonyl, cyclopropylethyloxycarbonyl, cyclobutylmethyloxycarbonyl, cyclopentylmethyloxycarbonyl, cyclohexylmethyloxycarbonyl, cyclohexylethyloxycarbonyl);
- (77) a C₃₋₈ cycloalkenyl-C₁₋₆ alkoxy-carbonyl group (e.g., cyclopentenylmethyloxycarbonyl, cyclohexenylmethyloxycarbonyl, cyclohexenylethyloxycarbonyl, cyclohexenylpropyloxycarbonyl);
- (78) a C₇₋₁₄ aralkyloxy-carbonyl group (e.g., benzyloxycarbonyl, phenethyloxycarbonyl);
- (79) a mono-C₁₋₆ alkylthio-carbamoyl group (e.g., methylthiocarbamoyl, ethylthiocarbamoyl, propylthiocarbamoyl);
- (80) a di-C₁₋₆ alkylthio-carbamoyl group (e.g., dimethylthiocarbamoyl, diethylthiocarbamoyl, dipropylthiocarbamoyl);
- (81) a C₁₋₆ alkyl-carbonyloxy group (e.g., acetyloxy, propanoyloxy, butanoyloxy, 2-methylpropanoyloxy);
- (82) an imino group optionally substituted by a hydroxy group; and
- (83) a C₁₋₆ alkylenedioxy group (e.g., methylenedioxy,

substituents selected from

- (a) a halogen atom,
- (b) a hydroxy group,
- (c) a C₁₋₆ alkoxy group, and

- 5 (d) a C₁₋₆ alkyl group optionally substituted by 1 to 3
halogen atoms; and
(5) an oxo group .

[0099]

10 The C₆₋₁₄ aryl group, C₇₋₁₄ aralkyl group, C₈₋₁₃ arylalkenyl
group and aromatic heterocyclic group have 1 to 5 (preferably 1
to 3) substituents at substitutable position(s). Examples of
the substituent include substituents selected from the above-
mentioned Substituent Group B excluding oxo. When the number
of the substituents is plural, the respective substituents may
15 be the same or different.

[0100]

Examples of the ~~"amino group"~~ of the "optionally
substituted amino group" for R¹ include an amino group
optionally mono- or di-substituted by substituent(s) selected
20 from a C₁₋₁₀ alkyl group, a C₂₋₁₀ alkenyl group, a C₃₋₁₀ cycloalkyl
group, a C₃₋₁₀ cycloalkenyl group, a C₆₋₁₄ aryl group, a C₇₋₁₄
aralkyl group, a C₈₋₁₃ arylalkenyl group, a heterocyclic group
(e.g., an aromatic heterocyclic group, a non-aromatic
heterocyclic group) and the like, each of which is optionally
25 substituted; and an acyl group. When the amino group is di-
substituted, the two substituent in combination optionally form
an optionally substituted heterocyclic group.

[0101]

The C₁₋₁₀ alkyl group and C₂₋₁₀ alkenyl group optionally have
30 1 to 5 (preferably 1 to 3) substituents at substitutable
position(s). Examples of the substituent include substituents
selected from the above-mentioned Substituent Group A. When
the number of the substituents is plural, the respective
substituents may be the same or different.

35 [0102]

- (c) a carbamoyl group,
- (d) a C₁₋₆ alkyl group (e.g., methyl), and
- (e) a C₁₋₆ alkoxy group (e.g., methoxy).

[0128]

5 R¹ is still more preferably a 3- to 8-membered monocyclic non-aromatic heterocyclic group (e.g., pyrrolidinyl) optionally substituted by 1 to 5 substituents selected from

- (a) a halogen atom (e.g., a fluorine atom), and
- (b) a cyano group.

10 [0129]

 In the formula (I), R² is an optionally substituted C₆₋₁₄ aryl group, or an optionally substituted aromatic heterocyclic group.

[0130]

15 The "C₆₋₁₄ aryl group" of the "optionally substituted C₆₋₁₄ aryl group" for R² optionally has 1 to 5 (preferably 1 to 3) substituents at substitutable position(s). Examples of the substituent include substituents selected from the above-mentioned Substituent Group B excluding an oxo group. When the
20 number of the substituents is plural, the respective substituents may be the same or different.

[0131]

 The "aromatic heterocyclic group" of the "optionally substituted aromatic heterocyclic group" for R² optionally has
25 1 to 5 (preferably 1 to 3) substituents at substitutable position(s). Examples of the substituent include substituents selected from the above-mentioned Substituent Group B excluding an oxo group. When the number of the substituents is plural, the respective substituents may be the same or different.

30 [0132]

 R² is preferably

(1) a C₆₋₁₄ aryl group (e.g., phenyl) optionally substituted by 1 to 3 substituents selected from

- (a) a halogen atom (e.g., a fluorine atom, a chlorine atom),

(1) a C₆₋₁₄ aryl group (e.g., phenyl) optionally substituted by 1 to 3 substituents selected from

(a) a halogen atom (e.g., a fluorine atom, a chlorine atom), and

5 (b) a C₁₋₆ alkyl group (e.g., methyl) optionally substituted by 1 to 3 halogen atoms (e.g., a fluorine atom), or

(2) a 5- to 12-membered aromatic heterocyclic group (preferably a 5- or 6-membered monocyclic aromatic

10 heterocyclic group (e.g., pyrazolyl, oxazolyl, thiazolyl, thiadiazolyl, pyridyl), a 8- to 12-membered fused aromatic heterocyclic group (e.g., indazolyl, benzothiazolyl)) optionally substituted by 1 to 3 substituents selected from

15 (a) a halogen atom (e.g., a chlorine atom, a bromine atom),

(b) a cyano group,

(c) a C₁₋₆ alkyl group (e.g., methyl, ethyl) optionally substituted by 1 to 3 halogen atoms (e.g., a fluorine atom), and

20 (d) a C₃₋₈ cycloalkyl group (e.g., cyclopropyl);

X¹ is a carbon atom or a nitrogen atom;

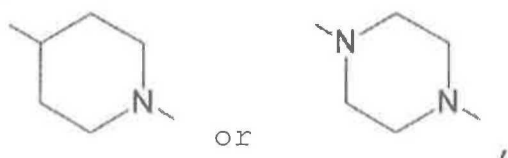
R³ is

(1) a hydrogen atom, or

(2) a halogen atom (e.g., a fluorine atom); and

25 Ring A is

[0194]



[0195]

each ~~of~~ which is optionally bridged (e.g., the ring

30 represented by the above-mentioned formula, 8-azabicyclo[3.2.1]octane, 2,5-diazabicyclo[2.2.1]heptane, 3-azabicyclo[3.1.0]hexane), each of which is optionally further substituted by 1 to 5 (preferably 1 to 3) substituents selected from

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