【CLAIMS】

Claim 1

A method for preparing a compound of Chemical Formula 9, the method comprising the following steps:

obtaining a compound of Chemical Formula 3 from the compound of Chemical Formula 2;

obtaining a compound of Chemical Formula 4 from the compound of Chemical Formula 3;

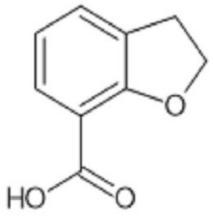
obtaining a compound of Chemical Formula 5 from the compound of Chemical Formula 4;

obtaining a compound of Chemical Formula 6 from a compound of Chemical Formula 5;

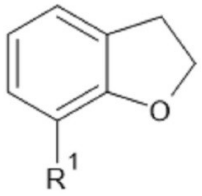
obtaining a compound of Chemical Formula 8 by reacting the compound of Chemical Formula 6 with a compound of Chemical Formula 7; and

obtaining a compound of Chemical Formula 9 from the compound of Chemical Formula 8

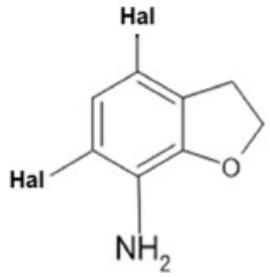
[Chemical Formula 2]



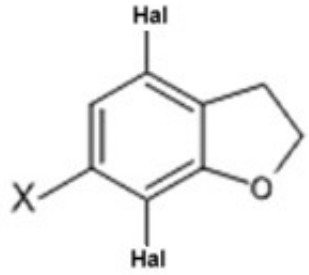
[Chemical Formula 3]



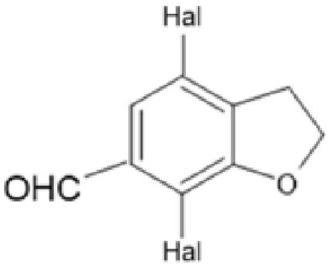
[Chemical Formula 4]



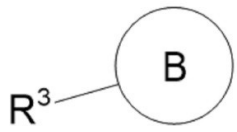
[Chemical Formula 5]



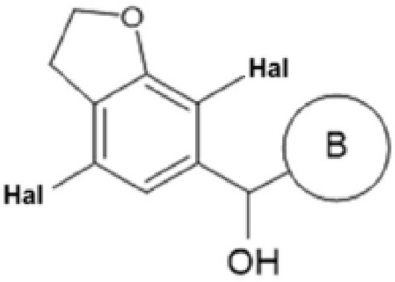
[Chemical Formula 6]



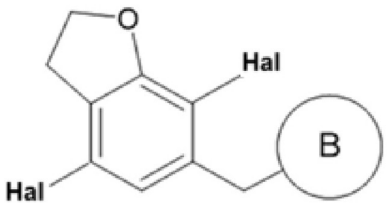
[Chemical Formula 7]



[Chemical Formula 8]



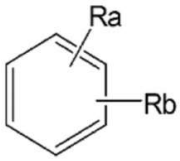
[Chemical Formula 9]

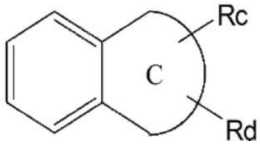


wherein, in the formulae,

R^1 is NH_2,

Hal, R^3 and X are each independently a halogen,

B is 

(B-1) or 

(B-2),

in this case, Ra, Rb, Rc, and Rd are each independently hydrogen, a halogen, hydroxy, mercapto, cyano, nitro, amino, carboxy, oxo, C1-7 alkyl, C1-7 alkylthio, C2-7 alkenyl, C2-7 alkynyl, C1-7 alkoxy, C1-7 alkoxy-C1-7 alkyl, C2-7 alkenyl-C1-7 alkyloxy, C2-7 alkynyl-C1-7 alkyloxy, C3-10 cycloalkyl, C3-7 cycloalkylthio, C5-10 cycloalkenyl, C3-10 cycloalkyloxy, C3-10 cycloalkyloxy-C1-7 alkoxy, phenyl-C1-7 alkyl, C1-7 alkylthio-phenyl, phenyl-C1-7 alkoxy, mono- or di-C1-7 alkylamino, mono- or di-C1-7 alkylamino-C1-7 alkyl, C1-7 alkanoyl, C1-7 alkanoylamino, C1-7 alkylcarbonyl, C1-7 alkoxycarbonyl, carbamoyl, mono- or di-C1-7 alkylcarbamoyl, C1-7 alkylsulfonylamino, phenylsulfonylamino, C1-7 alkylsulfinyl, C6-14 arylsulfanyl, C6-14 arylsulfonyl, C6-14 aryl, 5-13-membered heteroaryl, 5-10-membered heterocycloalkyl, 5-10-membered heterocycloalkyl-C1-7 alkyl, or 5-10-membered heterocycloalkyl-C1-7 alkoxy;

Ring C is C3-10 cycloalkyl, C5-10 cycloalkenyl, C6-14 aryl, 5-13-membered heteroaryl, or 5-10-membered heterocycloalkyl;

the alkyl, alkenyl, alkynyl and alkoxy are each independently unsubstituted or have one or more substituents selected from the group consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-7 alkyl, and C2-7 alkynyl;

the cycloalkyl, cycloalkenyl, aryl, heteroaryl and heterocycloalkyl are each independently unsubstituted or have one or more substituents selected from the group

consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-4 alkyl, and C1-4 alkoxy;

the heteroaryl and heterocycloalkyl each independently contain one or more heteroatoms selected from the group consisting of N, S and O.

Claim 2

The method of claim 1, wherein the obtaining of the compound of Chemical Formula 6 from the compound of Chemical Formula 5 comprises selectively converting an X substituent of the compound of Chemical Formula 5 into an aldehyde group using an organomagnesium reagent and dimethylformamide (DMF) as a reaction reagent.

Claim 3

The method of claim 2, wherein the organomagnesium reagent is used in an amount of 1 to 2 equivalents relative to 1 equivalent of the compound of Chemical Formula 5, and dimethylformamide is used in an amount of 3 to 6 equivalents relative to 1 equivalent of the compound of Chemical Formula 5.

Claim 4

The method of claim 2, wherein in the reaction, tetrahydrofuran (THF), diethyl ether, 2-methyl tetrahydrofuran or a mixture thereof are used as a reaction solvent, and the reaction solvent is used in an amount of 5-fold to 15-fold (w/v) of the compound of Chemical Formula 5.

Claim 5

The method of claim 2, wherein the reaction is performed at -10°C to 50°C.

Claim 6

The method of claim 1, wherein the obtaining of the compound of Chemical Formula 8 by reacting the compound of Chemical Formula 6 with the compound of Chemical Formula 7 comprises lithiating halogen position of the compound of Chemical Formula 7 and then coupling it with the compound of Chemical Formula 6.

Claim 7

The method of claim 6, wherein the lithiation is performed by 1 to 1.3 equivalents of an organolithium reagent relative to 1 equivalent of the compound of Chemical Formula 7.

Claim 8

The method of claim 6, wherein butyl magnesium chloride or tert-butyl magnesium chloride is added to the compound of Chemical Formula 7 in the solvent before the lithiation reaction.

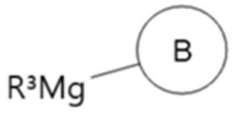
Claim 9

The method of claim 8, wherein the butyl magnesium chloride or tert-butyl magnesium chloride is used in an amount of 0.2 to 1 equivalent relative to 1 equivalent of the compound of Chemical Formula 7.

Claim 10

The method of claim 1, wherein the obtaining of the compound of Chemical Formula 8 by reacting the compound of Chemical Formula 6 with the compound of Chemical Formula 7 comprises obtaining a compound of Chemical Formula 7' from the compound of Chemical Formula 7 and coupling the compound of Chemical Formula 7' with the compound of Chemical Formula 6

[Chemical Formula 7']

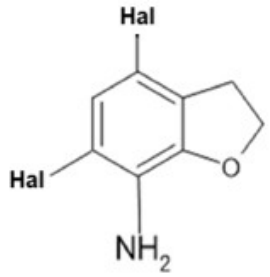


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Claim 11

The method of claim 1, wherein the compound of Chemical Formula 5 is obtained by halogenating the amine of a compound of Chemical Formula 4 through a Sandmeyer reaction

[Chemical Formula 4]



in the formula,

Hal represents independently a halogen.

Claim 12

The method of claim 11, wherein the Sandmeyer reaction comprises forming diazonium salts of the compound of Chemical Formula 4 by reacting the compound of Chemical Formula 4 with $NaNO_2$, and obtaining a compound of Chemical Formula 5 by reacting the diazonium salt of the compound of Chemical Formula 4 with a transition metal salt.

Claim 13

The method of claim 12, wherein $NaNO_2$ is used in an amount of 1 to 2 equivalents relative to 1 equivalent of the compound of Chemical Formula 4, and the reaction of the diazonium salt of the compound of Chemical Formula 4 with the transition metal salt is performed at 30°C to 80°C.

Claim 14

A method for preparing a compound of Chemical Formula 9, the method comprising the following steps:

obtaining a compound of Chemical Formula 11 from a compound of Chemical Formula 10;

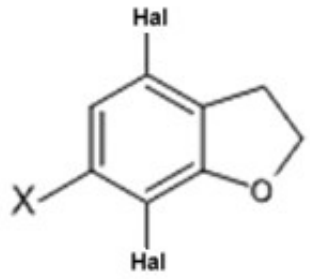
obtaining a compound of Chemical Formula 13 by reacting the compound of Chemical Formula 11 with a compound of Chemical Formula 12; and

obtaining a compound of Chemical Formula 9 from the compound of Chemical Formula 13,

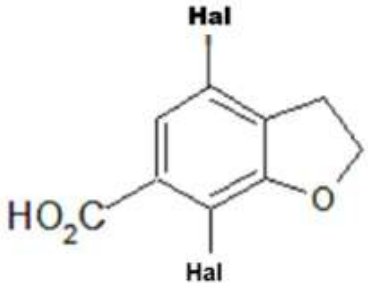
wherein the compound of Chemical Formula 10 is obtained by carboxylating a

compound of Chemical Formula 5:

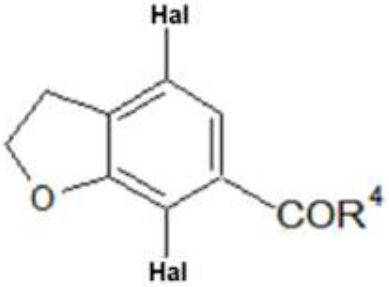
[Chemical Formula 5]



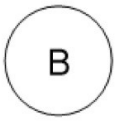
[Chemical Formula 10]



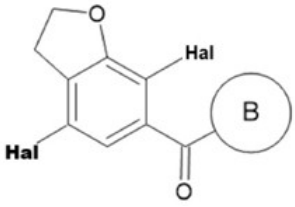
[Chemical Formula 11]



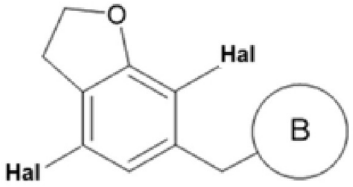
[Chemical Formula 12]



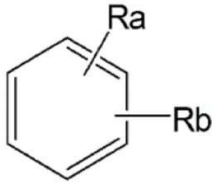
[Chemical Formula 13]

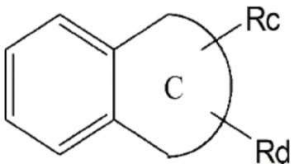


[Chemical Formula 9]



in the formulae,
Hal, X, and R^4 are each independently a halogen,

B is 

(B-1) or 

(B-2),

in this case, Ra, Rb, Rc, and Rd are each independently hydrogen, a halogen, hydroxy, mercapto, cyano, nitro, amino, carboxy, oxo, C1-7 alkyl, C1-7 alkylthio, C2-7 alkenyl, C2-7 alkynyl, C1-7 alkoxy, C1-7 alkoxy-C1-7 alkyl, C2-7 alkenyl-C1-7 alkyloxy, C2-7 alkynyl-C1-7 alkyloxy, C3-10 cycloalkyl, C3-7 cycloalkylthio, C5-10 cycloalkenyl, C3-10 cycloalkyloxy, C3-10 cycloalkyloxy-C1-7 alkoxy, phenyl-C1-7 alkyl, C1-7 alkylthio-phenyl, phenyl-C1-7 alkoxy, mono- or di-C1-7 alkylamino, mono- or di-C1-7 alkylamino-C1-7 alkyl, C1-7 alkanoyl, C1-7 alkanoylamino, C1-7 alkylcarbonyl, C1-7 alkoxycarbonyl, carbamoyl, mono- or di-C1-7 alkylcarbamoyl, C1-7 alkylsulfonylamino, phenylsulfonylamino, C1-7 alkylsulfinyl, C6-14 arylsulfanyl, C6-14 arylsulfonyl, C6-14 aryl, 5-13-membered heteroaryl, 5-10-membered heterocycloalkyl, 5-10-membered heterocycloalkyl-C1-7 alkyl, or 5-10-membered heterocycloalkyl-C1-7 alkoxy;

Ring C is C3-10 cycloalkyl, C5-10 cycloalkenyl, C6-14 aryl, 5-13-membered heteroaryl, or 5-10-membered heterocycloalkyl;

the alkyl, alkenyl, alkynyl and alkoxy are each independently unsubstituted or have one or more substituents selected from the group consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-7 alkyl, and C2-7 alkynyl;

the cycloalkyl, cycloalkenyl, aryl, heteroaryl and heterocycloalkyl are each independently unsubstituted or have one or more substituents selected from the group consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-4 alkyl, and C1-4 alkoxy;

the heteroaryl and heterocycloalkyl each independently contain one or more heteroatoms selected from the group consisting of N, S and O.

Claim 15

A method for preparing a compound of Chemical Formula 9, the method comprising the following steps:

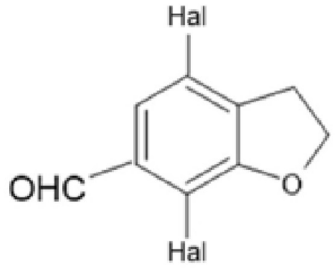
obtaining a compound of Chemical Formula 11 from a compound of Chemical Formula 10;

obtaining a compound of Chemical Formula 13 by reacting the compound of Chemical Formula 11 with a compound of Chemical Formula 12; and

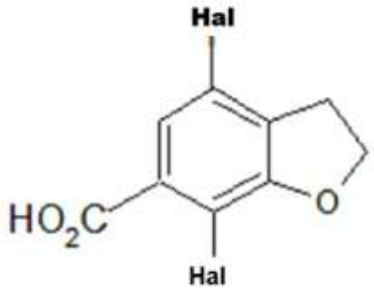
obtaining a compound of Chemical Formula 9 from the compound of Chemical Formula 13,

wherein the compound of Chemical Formula 10 is obtained by converting an aldehyde group of a compound of Chemical Formula 6 into a carboxyl group

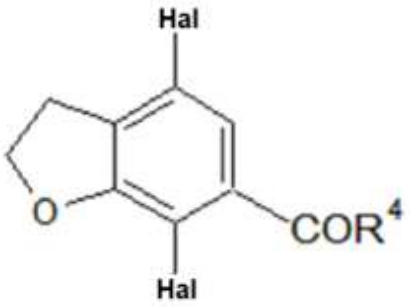
[Chemical Formula 6]



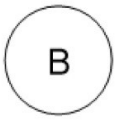
[Chemical Formula 10]



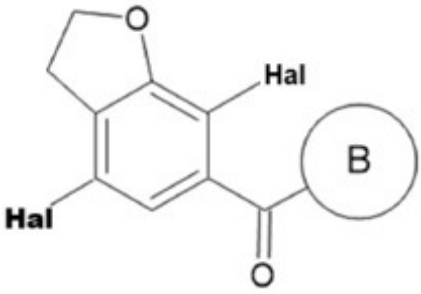
[Chemical Formula 11]



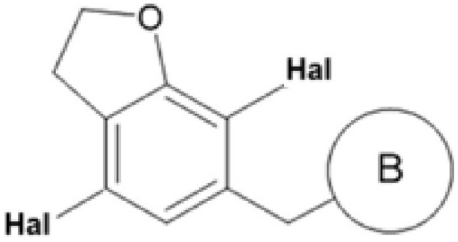
[Chemical Formula 12]



[Chemical Formula 13]

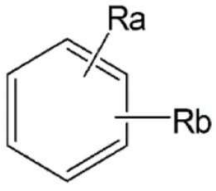


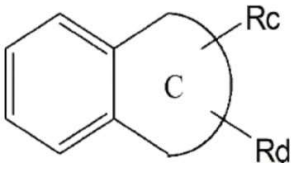
[Chemical Formula 9]



in the formula,

Hal and R^4 are each independently a halogen,

B is 

(B-1) or 

(B-2),

in this case, Ra, Rb, Rc, and Rd are each independently hydrogen, a halogen, hydroxy,

mercapto, cyano, nitro, amino, carboxy, oxo, C1-7 alkyl, C1-7 alkylthio, C2-7 alkenyl, C2-7 alkynyl, C1-7 alkoxy, C1-7 alkoxy-C1-7 alkyl, C2-7 alkenyl-C1-7 alkyloxy, C2-7 alkynyl-C1-7 alkyloxy, C3-10 cycloalkyl, C3-7 cycloalkylthio, C5-10 cycloalkenyl, C3-10 cycloalkyloxy, C3-10 cycloalkyloxy-C1-7 alkoxy, phenyl-C1-7 alkyl, C1-7 alkylthio-phenyl, phenyl-C1-7 alkoxy, mono- or di-C1-7 alkylamino, mono- or di-C1-7 alkylamino-C1-7 alkyl, C1-7 alkanoyl, C1-7 alkanoylamino, C1-7 alkylcarbonyl, C1-7 alkoxycarbonyl, carbamoyl, mono- or di-C1-7 alkylcarbamoyl, C1-7 alkylsulfonylamino, phenylsulfonylamino, C1-7 alkylsulfinyl, C6-14 arylsulfanyl, C6-14 arylsulfonyl, C6-14 aryl, 5-13-membered heteroaryl, 5-10-membered heterocycloalkyl, 5-10-membered heterocycloalkyl-C1-7 alkyl, or 5-10-membered heterocycloalkyl-C1-7 alkoxy;

Ring C is C3-10 cycloalkyl, C5-10 cycloalkenyl, C6-14 aryl, 5-13-membered heteroaryl, or 5-10-membered heterocycloalkyl;

the alkyl, alkenyl, alkynyl and alkoxy are each independently unsubstituted or have one or more substituents selected from the group consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-7 alkyl, and C2-7 alkynyl;

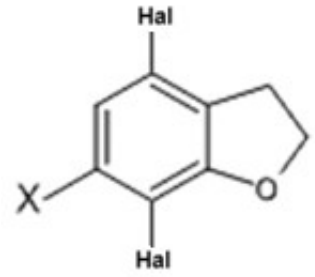
the cycloalkyl, cycloalkenyl, aryl, heteroaryl and heterocycloalkyl are each independently unsubstituted or have one or more substituents selected from the group consisting of a halogen, hydroxy, cyano, nitro, amino, mercapto, C1-4 alkyl, and C1-4 alkoxy;

the heteroaryl and heterocycloalkyl each independently contain one or more heteroatoms selected from the group consisting of N, S and O.

Claim 16

The method of claim 15, wherein the compound of Chemical Formula 6 is obtained by selectively converting an X substituent of the compound of Chemical Formula 5 into an aldehyde group.

[Chemical Formula 5]



in the formula,

Hal and X are each independently a halogen.

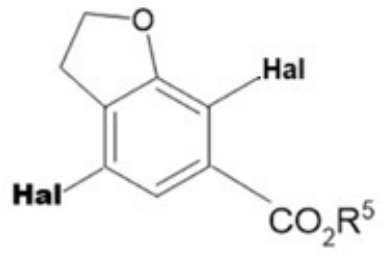
Claim 17

The method of claim 15, wherein the compound of Chemical Formula 6 is obtained by:

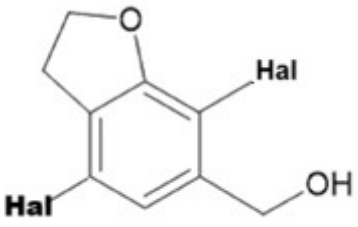
obtaining a compound of Chemical Formula 15 from the compound of Chemical Formula 14, and

obtaining the compound of Chemical Formula 6 from the compound of Chemical Formula 15:

[Chemical Formula 14]



[Chemical Formula 15]



in the formulae,

Hal represents independently a halogen, and

R^5 is a C_{1-4} alkyl.