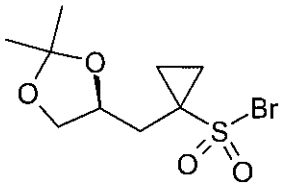
CLAIMS

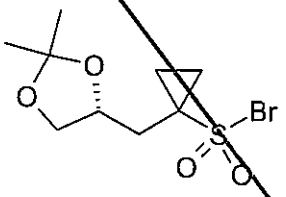
1. A compound selected from :

1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonyl bromide (*S*)-10-Br :



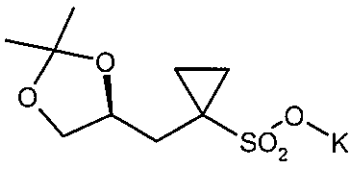
(S)-10-Br ;

1-{[(4*R*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonyl bromide (*R*)-10-Br :



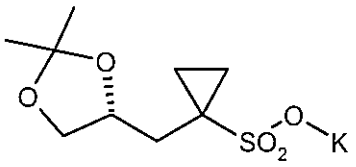
(R)-10-Br ;

potassium 1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropane-sulfonate (*S*)-7' :



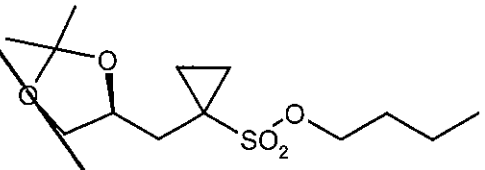
(S)-7' ;

potassium 1-{[(4R)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropane-sulfonate (R)-7' :



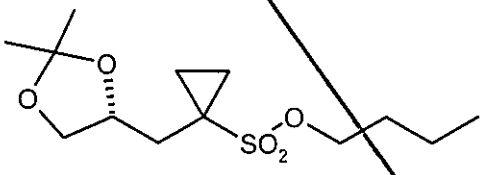
(R)-7' ;

Butyl 1-{[(4S)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonate (S)-6 :



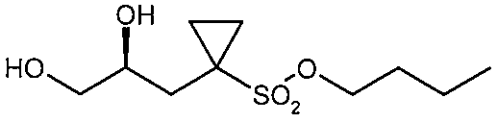
(S)-6 ;

Butyl 1-{[(4R)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonate (R)-6 :



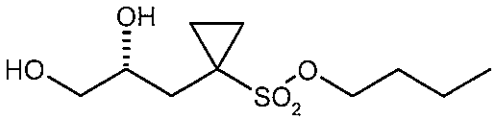
(R)-6 ;

Butyl 1-[(2S)-2,3-dihydroxypropyl]cyclopropanesulfonate (S)-5 :



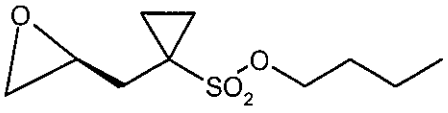
(S)-5 ;

Butyl 1-[(2R)-2,3-dihydroxypropyl]cyclopropanesulfonate (R)-5 :



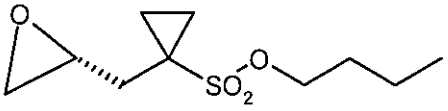
(R)-5 ;

Butyl 1-[(2*S*)-oxiran-2-ylmethyl]cyclopropanesulfonate (*S*)-4 :



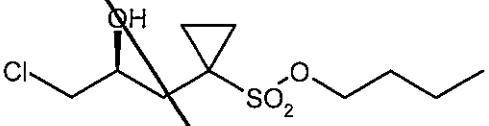
(S)-4 ;

Butyl 1-[(2R)-oxiran-2-ylmethyl]cyclopropanesulfonate (R)-4 :



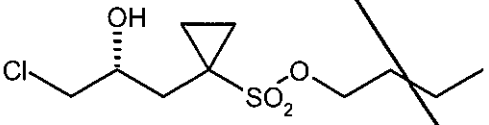
(R)-4 ;

Butyl 1-[(2*S*)-3-chloro-2-hydroxypropyl]cyclopropanesulfonate (*S*)-3 :



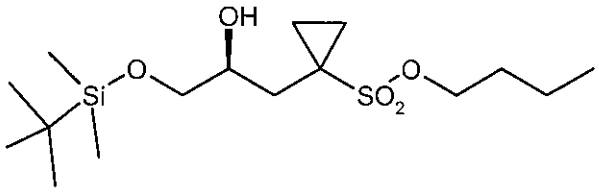
(S)-3 ;

Butyl 1-[(2*R*)-3-chloro-2-hydroxypropyl]cyclopropanesulfonate (*R*)-3 :



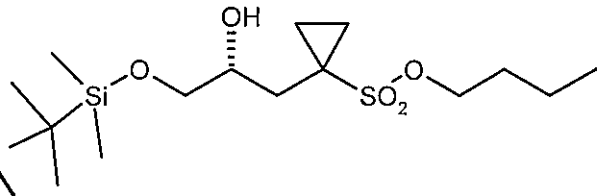
(R)-3 ;

Butyl 1-[(2S)-3-{[tert-butyl(dimethyl)silyl]oxy}-2-hydroxypropyl]cyclopropane-sulfonate (S)-9a :



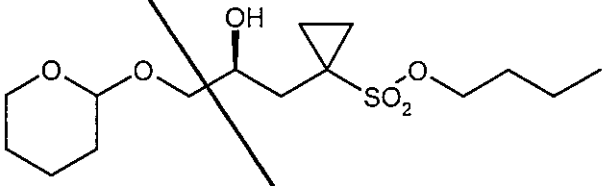
(S)-9a ;

Butyl 1-[(2R)-3-{[tert-butyl(dimethyl)silyl]oxy}-2-hydroxypropyl]cyclopropane-sulfonate (R)-9a :



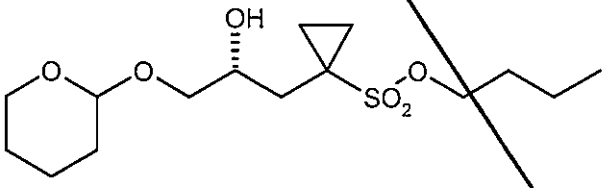
(R)-9a ;

Butyl 1-[(2S)-2-hydroxy-3-(tetrahydro-2H-pyran-2-yloxy)propyl]cyclopropane sulfonate (S)-9b :



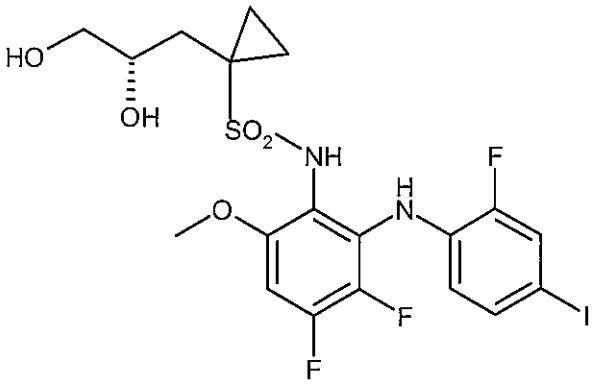
(S)-9b ;

Butyl 1-[(2R)-2-hydroxy-3-(tetrahydro-2H-pyran-2-yloxy)propyl]cyclopropane sulfonate (R)-9b :



(R)-9b.

2. A method of preparing a compound of formula (S)-14 :

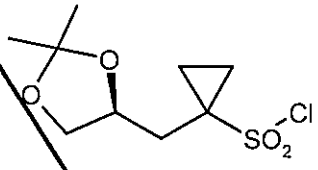


(S)-14 ;

comprising :

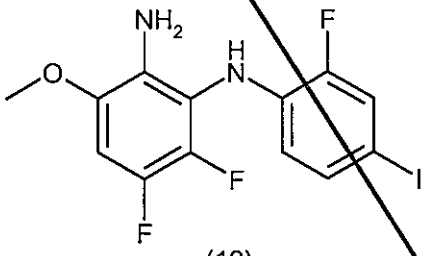
i) the following step J :

wherein a compound of formula (S)-10 :



(S)-10

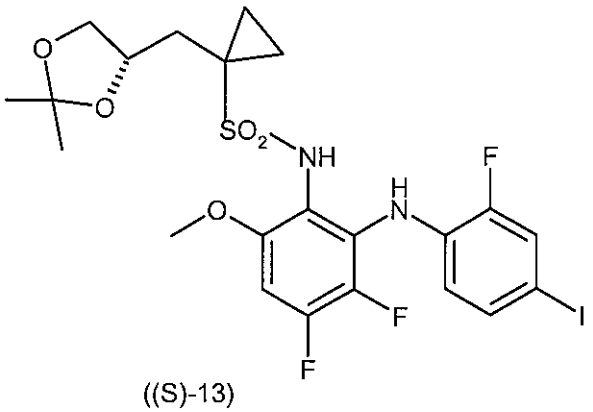
is allowed to react with a compound of formula (12) :



(12)

in the presence of a bromide, such as tetra-n-butylammonium bromide or lithium bromide for example, optionally in the presence of a base, such as pyridine for example, optionally in a solvent, such as sulfolane for example,

thereby providing a reaction mixture containing a compound of formula (S)-13 :



((S)-13) ;

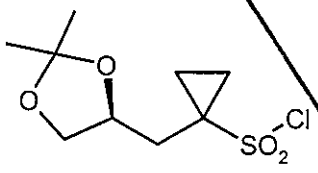
and, then,

ii) the following step K :

wherein an aqueous mineral acid, such as hydrochloric acid for example, is added to said reaction mixture containing a compound of formula (S)-13,

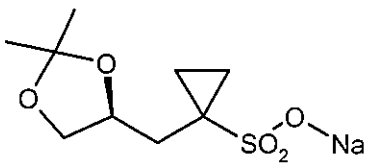
thereby providing a compound of formula (S)-14 ;

said compound of formula (S)-10 :



(S)-10

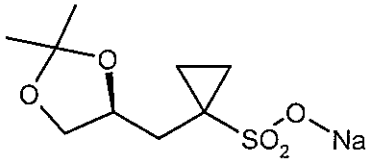
being prepared by allowing a compound of formula (S)-7 :



(S)-7 ,

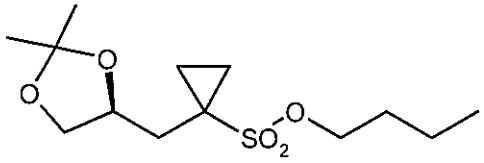
to react with a chlorinating agent, such as $P(O)Cl_3$, PCl_3 or $SOCl_2$ for example, optionally in a solvent, such as pyridine for example, thereby providing a compound of formula (S)-10 ;

said compound of formula (S)-7 :



(S)-7

being prepared by allowing a compound of formula (S)-6 :

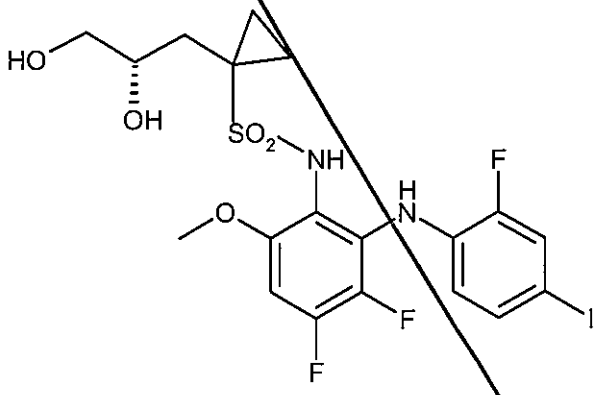


(S)-6

to react with a sodium alkoxide, such as sodium methoxide for example, optionally in a solvent, such as methanol for example,

thereby providing a compound of formula (S)-7.

3. A method of preparing a compound of formula (S)-14 :

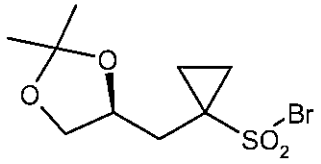


(S)-14 ;

comprising :

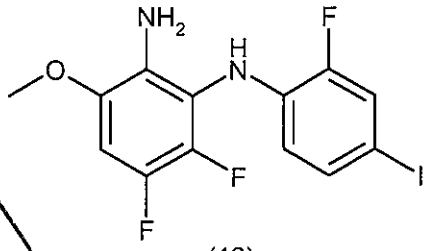
i) the following step J :

wherein a compound of formula (S)-10-Br :



(S)-10-Br

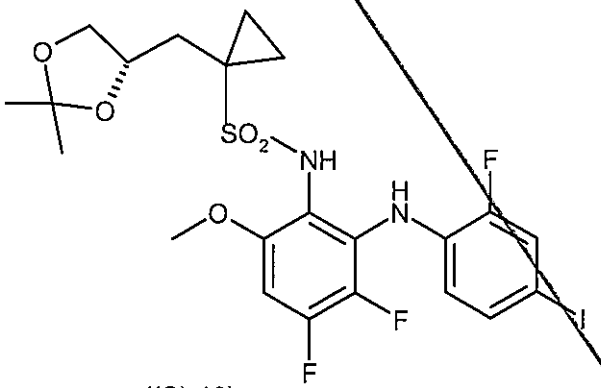
is allowed to react with a compound of formula (12) :



(12)

optionally in the presence of a base, such as pyridine for example, optionally in a solvent, such as sulfolane for example,

thereby providing a reaction mixture containing a compound of formula (S)-13 :



((S)-13) ;

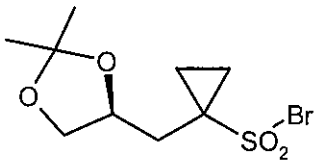
and, then,

ii) the following step K :

wherein an aqueous mineral acid, such as hydrochloric acid for example, is added to said reaction mixture containing a compound of formula (S)-13,

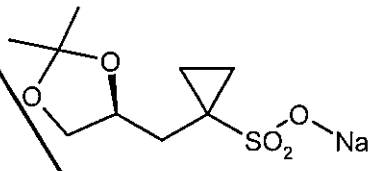
thereby providing a compound of formula (S)-14 ;

said compound of formula (S)-10-Br :



(S)-10-Br

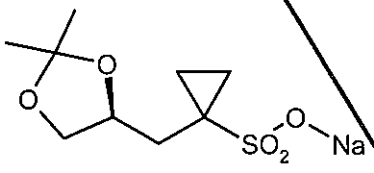
being prepared by allowing a compound of formula (S)-7 :



(S)-7 ,

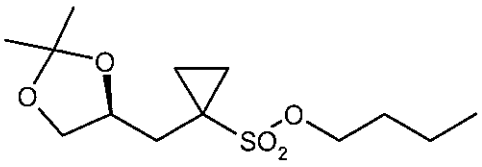
to react with a brominating agent, such as $P(O)Br_3$, PBr_3 or $SOBr_2$ for example, optionally in a solvent, such as pyridine for example, thereby providing a compound of formula (S)-10-Br;

said compound of formula (S)-7 :



(S)-7

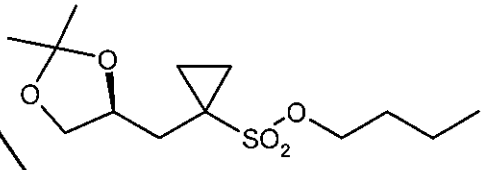
being prepared by allowing a compound of formula (S)-6 :



(S)-6

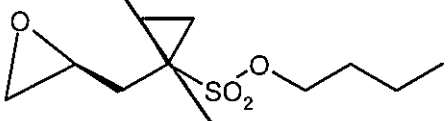
to react with a sodium alkoxide, such as sodium methoxide for example, optionally in a solvent, such as methanol for example,
thereby providing a compound of formula (S)-7.

4. The method of claim 2 or 3, wherein said compound of formula (S)-6 :



(S)-6

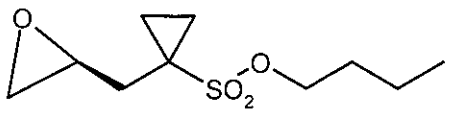
is prepared by allowing a compound of formula (S)-4 :



(S)-4

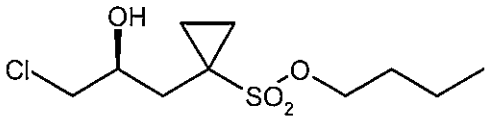
to react with either :
a) boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example, such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example, optionally in a solvent such as acetone for example, or
b) phosphomolybdic acid hydrate, optionally in a solvent such as acetone for example,
thereby providing a compound of formula (S)-6.

5. The method of claim 4, wherein said compound of formula (S)-4 :



(S)-4

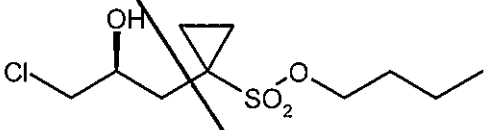
is prepared by allowing a compound of formula (S)-3 :



(S)-3 ;

to react with a base, such as sodium hydroxide for example, optionally in a solvent, such as water for example,
thereby providing a compound of formula (S)-4.

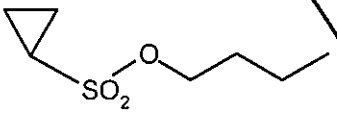
6. The method of claim 5, wherein said compound of formula (S)-3 :



(S)-3 ;

is prepared by :

a) allowing a compound of formula 2 :



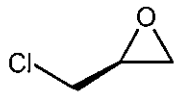
(2)

to react with a base, such as n-butyllithium for example, optionally in a solvent, such as tetrahydrofuran for example,

b) adding a compound of formula (S)-1 and boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example,

such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example ; and

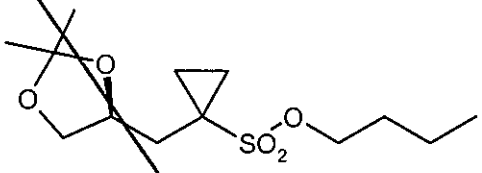
c) allowing the thus-formed deprotonated compound of formula 2 to react with a compound of formula (S)-1 :



(S)-1 ;

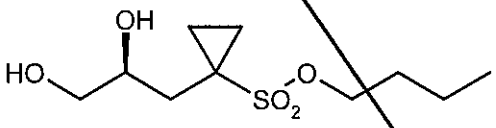
thereby providing a compound of formula (S)-3.

7. The method of claim 2 or 3, wherein said compound of formula (S)-6 :



(S)-6

is prepared by allowing a compound of formula (S)-5 :

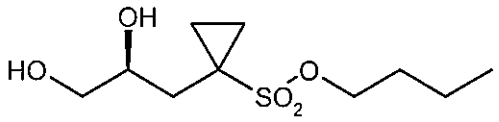


(S)-5

to react with 2,2-dimethoxypropane, optionally in a solvent, such as tetrahydrofuran for example and optionally in the presence of a catalyst, such as pyridinium p-toluenesulfonate for example,

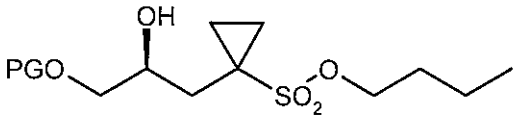
thereby providing a compound of formula (S)-6.

8. The method of claim 7, wherein said compound of formula (S)-5 :



(S)-5

is prepared by allowing a compound of formula (S)-9 :



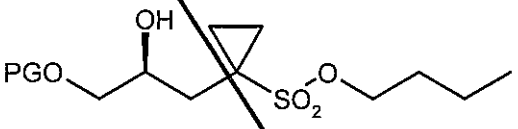
(S)-9 ;

wherein PG represents a protecting group, such as a t-butyldimethylsilyl- group (compound (S)-9a) or a tetrahydropyranyl group (compound (S)-9b), for example,

to react with an acid, such as hydrochloric acid or p-toluene sulfonic acid for example, optionally in a solvent, such as methanol for example,

thereby providing a compound of formula (S)-5.

9. The method of claim 8, wherein said compound of formula (S)-9 :

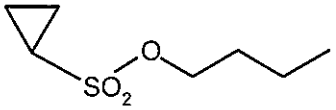


(S)-9 ;

wherein PG represents a t-butyldimethylsilyl- group (compound (S)-9a) or a tetrahydropyranyl group (compound (S)-9b),

is prepared by :

a) allowing a compound of formula 2 :

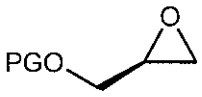


(2)

to react with a base, such as n-butyllithium for example, optionally in a solvent, such as tetrahydrofuran for example,

b) adding a compound of formula (S)-8 and boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example, such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example ; and

c) allowing the thus-formed deprotonated compound of formula 2 to react with a compound of formula (S)-8 :

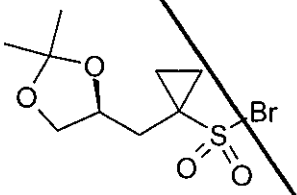


(S)-8,

wherein PG represents a t-butyldimethylsilyl- group (compound (S)-8a) or a tetrahydropyranyl group (compound (S)-8b), respectively,
thereby providing a compound of formula (S)-9.

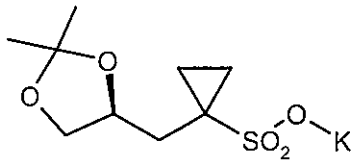
10. Use of a compound selected from :

1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonyl bromide (*S*)-10-Br :



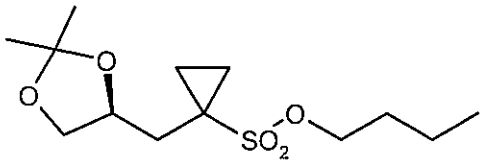
(S)-10-Br ;

potassium 1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropane-sulfonate (*S*)-7' :



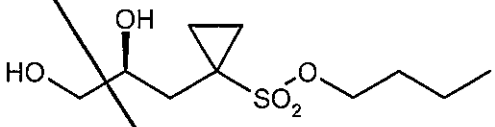
(S)-7' ;

Butyl 1-{[(4S)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonate (S)-6 :



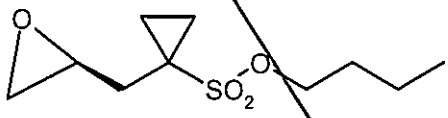
(S)-6 ;

Butyl 1-[(2S)-2,3-dihydroxypropyl]cyclopropanesulfonate (S)-5 :



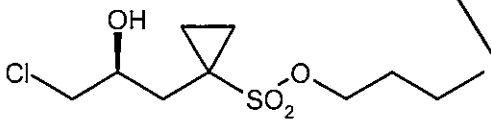
(S)-5 ;

Butyl 1-[(2S)-oxiran-2-ylmethyl]cyclopropanesulfonate (S)-4 :



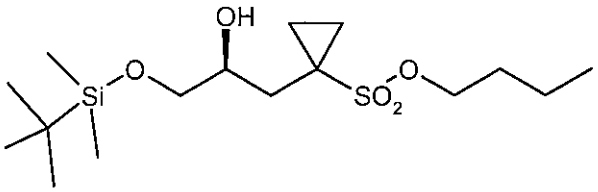
(S)-4 ;

Butyl 1-[(2S)-3-chloro-2-hydroxypropyl]cyclopropanesulfonate (S)-3 :



(S)-3 ;

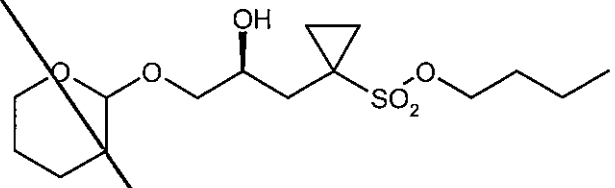
Butyl 1-[(2S)-3-{[tert-butyl(dimethyl)silyl]oxy}-2-hydroxypropyl] cyclopropane-sulfonate (S)-9a :



(S)-9a ;

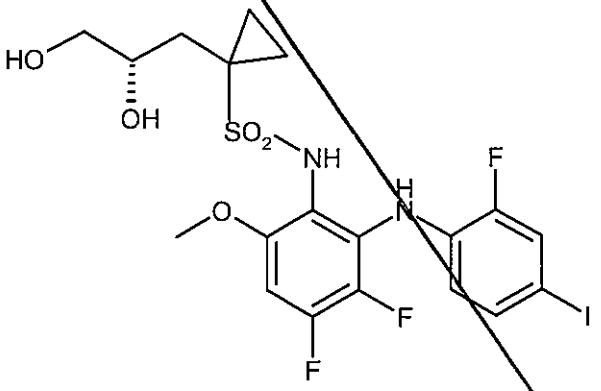
and

Butyl 1-[(2S)-2-hydroxy-3-(tetrahydro-2H-pyran-2-yloxy)propyl]cyclopropane sulfonate (S)-9b :



(S)-9b ;

for preparing a compound of formula (S)-14 :

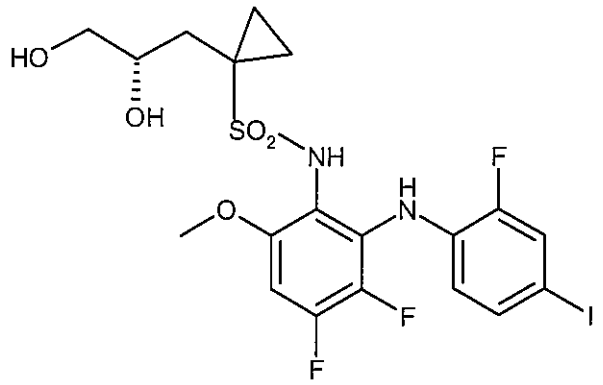


(S)-14.

11. One or more relevant compounds from claim 1 used in any one of the method steps of claims 2-9.

CLAIMS

1. A method of preparing a compound of formula (S)-14 :

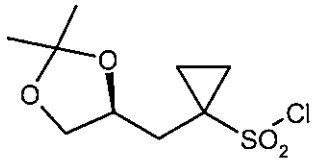


(S)-14 ;

comprising :

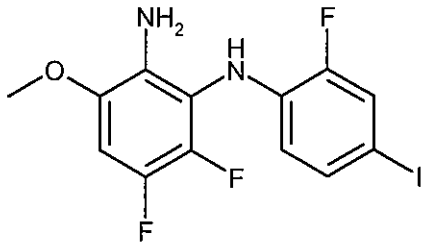
i) the following step J :

wherein a compound of formula (S)-10 :



(S)-10

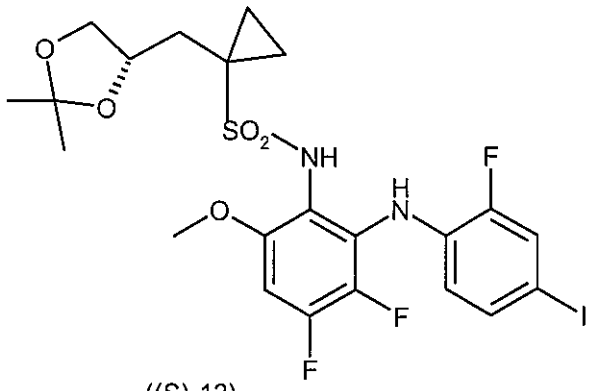
is allowed to react with a compound of formula (12) :



(12)

in the presence of a bromide, such as tetra-n-butylammonium bromide or lithium bromide for example, optionally in the presence of a base, such as pyridine for example, optionally in a solvent, such as sulfolane for example,

thereby providing a reaction mixture containing a compound of formula (S)-13 :



((S)-13) ;

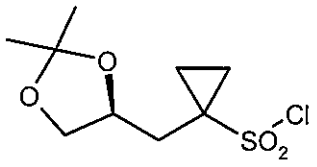
and, then,

ii) the following step K :

wherein an aqueous mineral acid, such as hydrochloric acid for example, is added to said reaction mixture containing a compound of formula (S)-13,

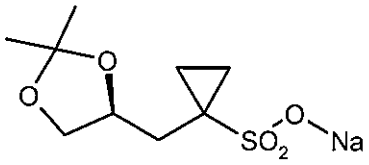
thereby providing a compound of formula (S)-14 ;

said compound of formula (S)-10 :



(S)-10

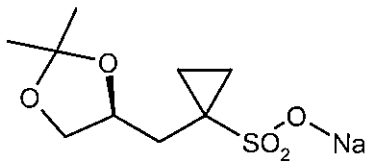
being prepared by allowing a compound of formula (S)-7 :



(S)-7 ,

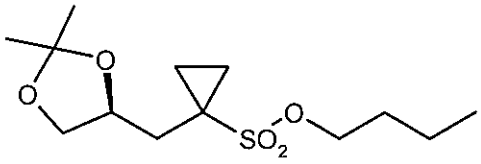
to react with a chlorinating agent, such as $P(O)Cl_3$, PCl_3 or $SOCl_2$ for example, optionally in a solvent, such as pyridine for example, thereby providing a compound of formula (S)-10 ;

said compound of formula (S)-7 :



(S)-7

being prepared by allowing a compound of formula (S)-6 :

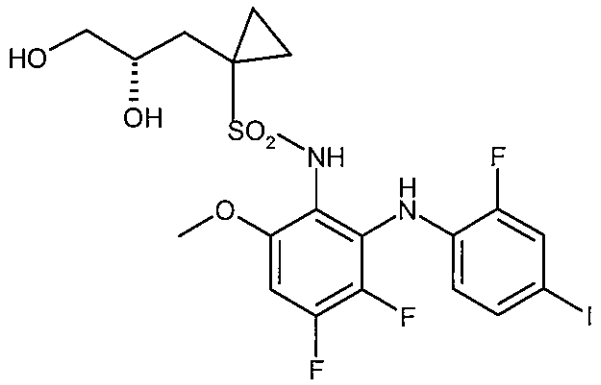


(S)-6

to react with a sodium alkoxide, such as sodium methoxide for example, optionally in a solvent, such as methanol for example,

thereby providing a compound of formula (S)-7.

2. A method of preparing a compound of formula (S)-14 :

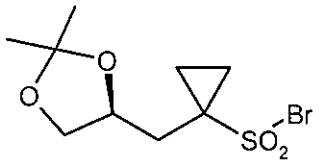


(S)-14 ;

comprising :

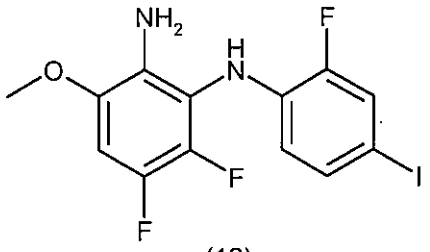
i) the following step J :

wherein a compound of formula (S)-10-Br :



(S)-10-Br

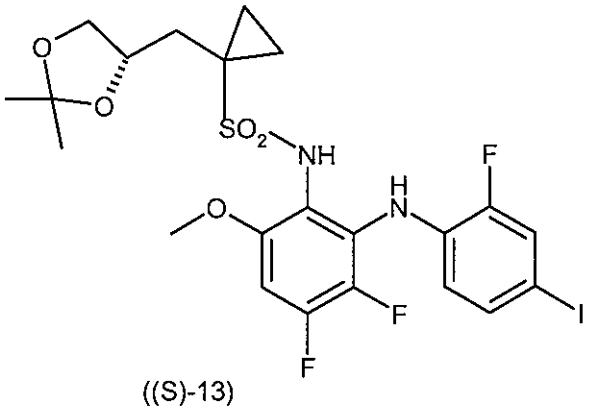
is allowed to react with a compound of formula (12) :



(12)

optionally in the presence of a base, such as pyridine for example, optionally in a solvent, such as sulfolane for example,

thereby providing a reaction mixture containing a compound of formula (S)-13 :



((S)-13) ;

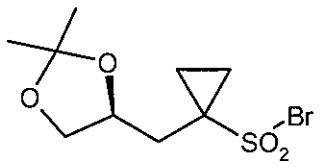
and, then,

ii) the following step K :

wherein an aqueous mineral acid, such as hydrochloric acid for example, is added to said reaction mixture containing a compound of formula (S)-13,

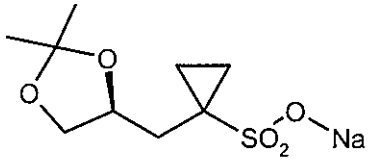
thereby providing a compound of formula (S)-14 ;

said compound of formula (S)-10-Br :



(S)-10-Br

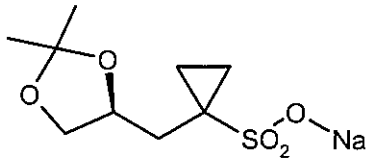
being prepared by allowing a compound of formula (S)-7 :



(S)-7 ,

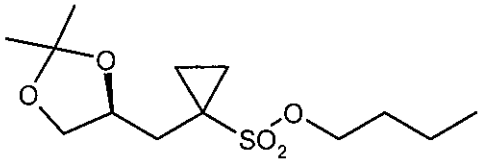
to react with a brominating agent, such as $P(O)Br_3$, PBr_3 or $SOBr_2$ for example, optionally in a solvent, such as pyridine for example, thereby providing a compound of formula (S)-10-Br;

said compound of formula (S)-7 :



(S)-7

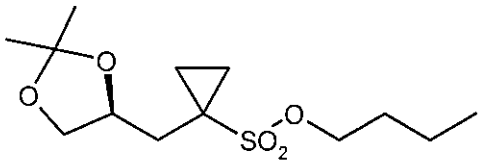
being prepared by allowing a compound of formula (S)-6 :



(S)-6

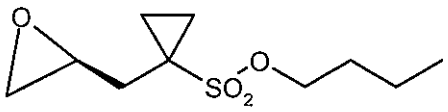
to react with a sodium alkoxide, such as sodium methoxide for example, optionally in a solvent, such as methanol for example,
thereby providing a compound of formula (S)-7.

3. The method of claim 1 or 2, wherein said compound of formula (S)-6 :



(S)-6

is prepared by allowing a compound of formula (S)-4 :



(S)-4

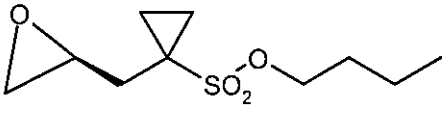
to react with either :

a) boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example, such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example, optionally in a solvent such as acetone for example, or

b) phosphomolybdic acid hydrate, optionally in a solvent such as acetone for example,

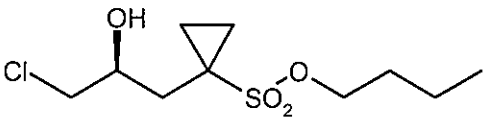
thereby providing a compound of formula (S)-6.

4. The method of claim 3, wherein said compound of formula (S)-4 :



(S)-4

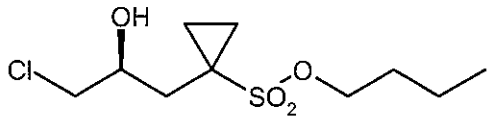
is prepared by allowing a compound of formula (S)-3 :



(S)-3 ;

to react with a base, such as sodium hydroxide for example, optionally in a solvent, such as water for example,
thereby providing a compound of formula (S)-4.

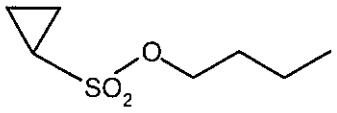
5. The method of claim 4, wherein said compound of formula (S)-3 :



(S)-3 ;

is prepared by :

a) allowing a compound of formula 2 :

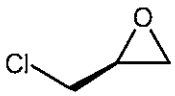


(2)

to react with a base, such as n-butyllithium for example, optionally in a solvent, such as tetrahydrofuran for example,

b) adding a compound of formula (S)-1 and boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example, such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example ; and

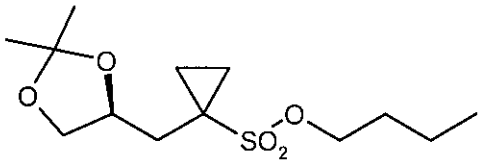
c) allowing the thus-formed deprotonated compound of formula 2 to react with a compound of formula (S)-1 :



(S)-1 ;

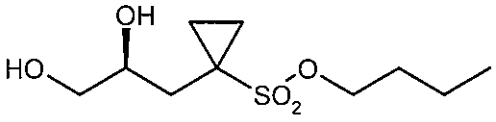
thereby providing a compound of formula (S)-3.

6. The method of claim 1 or 2, wherein said compound of formula (S)-6 :



(S)-6

is prepared by allowing a compound of formula (S)-5 :

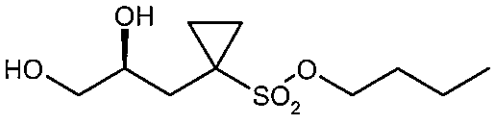


(S)-5

to react with 2,2-dimethoxypropane, optionally in a solvent, such as tetrahydrofuran for example and optionally in the presence of a catalyst, such as pyridinium p-toluenesulfonate for example,

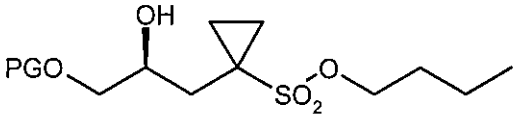
thereby providing a compound of formula (S)-6.

7. The method of claim 6, wherein said compound of formula (S)-5 :



(S)-5

is prepared by allowing a compound of formula (S)-9 :



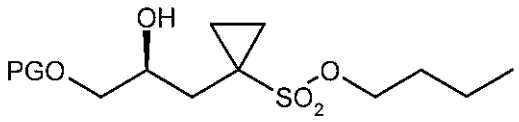
(S)-9 ;

wherein PG represents a protecting group, such as a t-butyldimethylsilyl-group (compound (S)-9a) or a tetrahydropyranyl group (compound (S)-9b), for example,

to react with an acid, such as hydrochloric acid or p-toluene sulfonic acid for example, optionally in a solvent, such as methanol for example,

thereby providing a compound of formula (S)-5.

8. The method of claim 7, wherein said compound of formula (S)-9 :

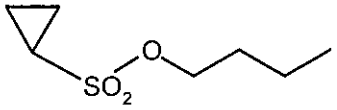


(S)-9 ;

wherein PG represents a t-butyldimethylsilyl- group (compound (S)-9a) or a tetrahydropyranyl group (compound (S)-9b),

is prepared by :

a) allowing a compound of formula 2 :

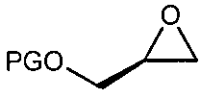


(2)

to react with a base, such as n-butyllithium for example, optionally in a solvent, such as tetrahydrofuran for example,

b) adding a compound of formula (S)-8 and boron trifluoride, optionally in the form of a complex, such as a boron trifluoride etherate complex for example, such as a boron trifluoride tetrahydrofuran complex, or a boron trifluoride diethylether complex for example ; and

c) allowing the thus-formed deprotonated compound of formula 2 to react with a compound of formula (S)-8 :



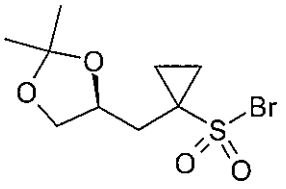
(S)-8,

wherein PG represents a t-butyldimethylsilyl- group (compound (S)-8a) or a tetrahydropyranyl group (compound (S)-8b), respectively,

thereby providing a compound of formula (S)-9.

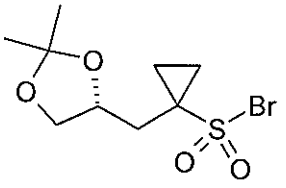
9. One or more relevant compounds selected from :

1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonyl bromide (*S*)-10-Br :



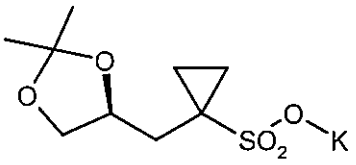
(S)-10-Br ;

1-{[(4*R*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonyl bromide (*R*)-10-Br :



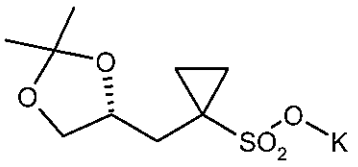
(R)-10-Br ;

potassium 1-{[(4*S*)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropane-sulfonate (*S*)-7' :



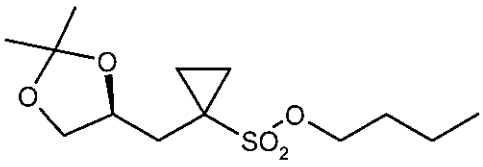
(S)-7' ;

potassium 1-{[(4R)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropane-sulfonate (R)-7' :



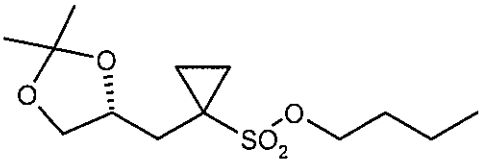
(R)-7' ;

Butyl 1-{[(4S)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonate (S)-6 :



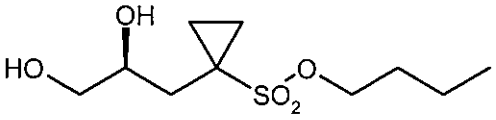
(S)-6 ;

Butyl 1-{[(4R)-2,2-dimethyl-1,3-dioxolan-4-yl]methyl}cyclopropanesulfonate (R)-6 :



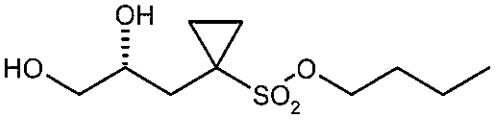
(R)-6 ;

Butyl 1-[(2S)-2,3-dihydroxypropyl]cyclopropanesulfonate (S)-5 :



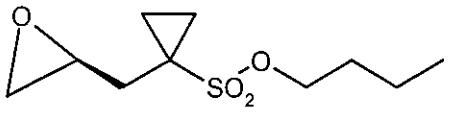
(S)-5 ;

Butyl 1-[(2R)-2,3-dihydroxypropyl]cyclopropanesulfonate (R)-5 :



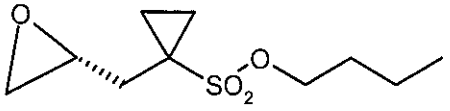
(R)-5 ;

Butyl 1-[(2S)-oxiran-2-ylmethyl]cyclopropanesulfonate (S)-4 :



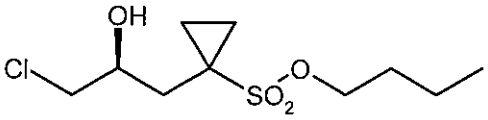
(S)-4 ;

Butyl 1-[(2R)-oxiran-2-ylmethyl]cyclopropanesulfonate (R)-4 :



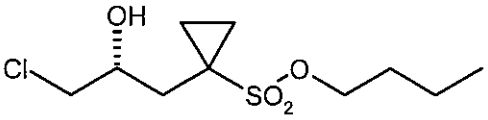
(R)-4 ;

Butyl 1-[(2*S*)-3-chloro-2-hydroxypropyl]cyclopropanesulfonate (*S*)-3 :



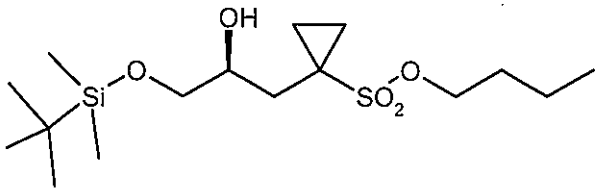
(S)-3 ;

Butyl 1-[(2*R*)-3-chloro-2-hydroxypropyl]cyclopropanesulfonate (*R*)-3 :



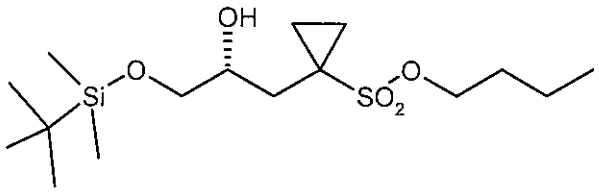
(R)-3 ;

Butyl 1-[(2S)-3-{[tert-butyl(dimethyl)silyl]oxy}-2-hydroxypropyl]cyclopropane-sulfonate (S)-9a :



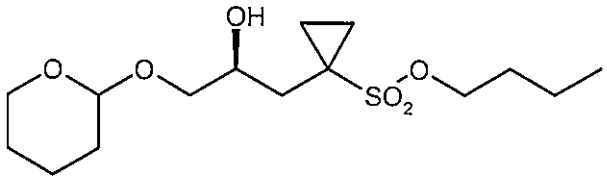
(S)-9a ;

Butyl 1-[(2R)-3-{[tert-butyl(dimethyl)silyl]oxy}-2-hydroxypropyl]cyclopropane-sulfonate (R)-9a :



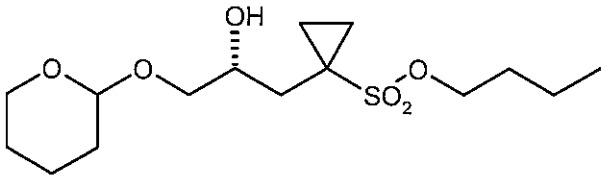
(R)-9a ;

Butyl 1-[(2S)-2-hydroxy-3-(tetrahydro-2H-pyran-2-yloxy)propyl]cyclopropane sulfonate (S)-9b :



(S)-9b ;

Butyl 1-[(2R)-2-hydroxy-3-(tetrahydro-2H-pyran-2-yloxy)propyl]cyclopropane sulfonate (R)-9b :



(R)-9b;

used in any one of the method steps of claims 1-8.