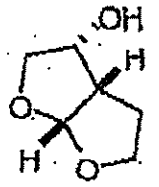
What is claimed is:

1. A process for preparing a bisfuran alcohol of Formula 0:

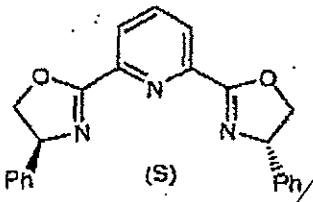


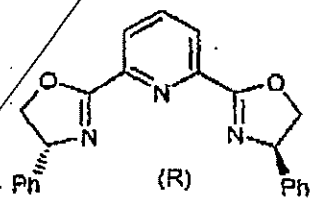
Formula 0,

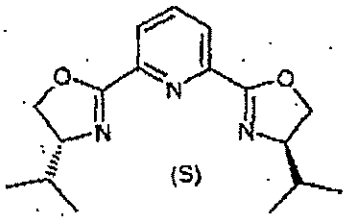
comprising,

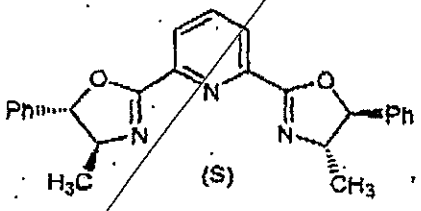
reacting 2,3-dihydrofuran and a glycoaldehyde or glycoaldehyde dimer in the presence of a lanthanide or transition metal catalyst to form the bisfuran alcohol of Formula 0.

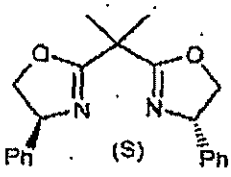
2. The process of claim 1, where the catalyst comprises Yb, Pr, Cu, Eu or Sc complexed to a ligand selected from:











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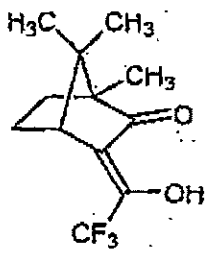
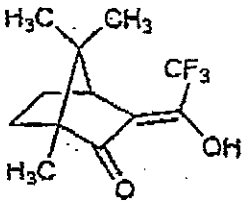
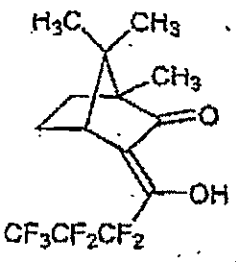
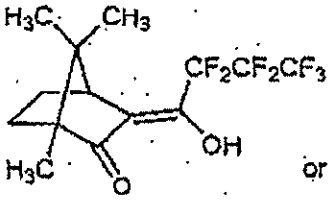
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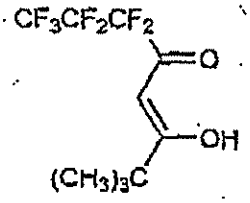
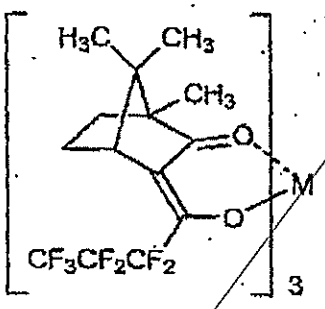
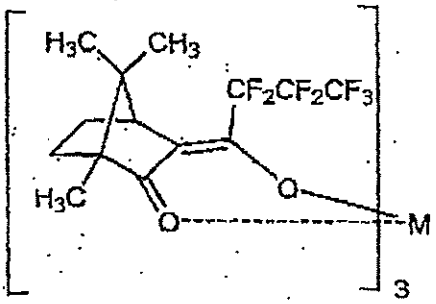
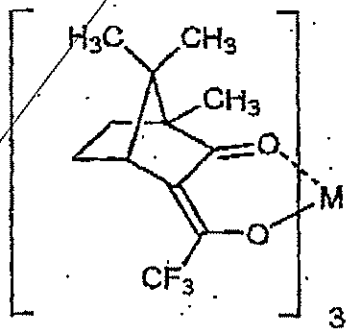
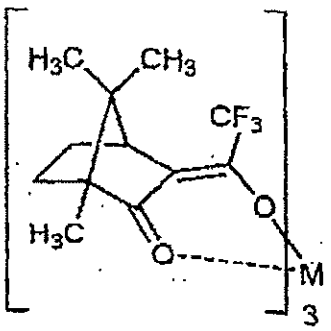


3. The process of claim 2, where the catalyst is $Yb(hfc)_3(+)$, $Yb(hfc)_3(-)$, $Eu(hfc)_3(+)$, $Eu(hfc)_3(-)$, $Yb(fod)_3(+)$ and S-Binaphthol, $Yb(tfc)_3(+)$, $Sc(OTf)_3$ and (S)-pybox, and $Pr(tfc)_3(+)$

where

$M(hfc)_3$ (-) =

$M(hfc)_3$ (+) =


$M(tfc)_3$ (-) =

$M(tfc)_3$ (+) =


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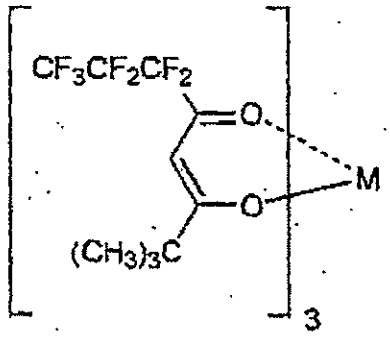
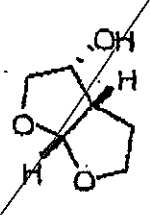
and

$M(fod)_3 =$ 

where, M represents Yb, Pr, Cu, Eu or Sc.

4. The process of claim 1, where the reaction is carried out at a temperature of between about 0°C to about 100°C.

5. The process of claim 1, where the bisfuran alcohol of Formula 0 is



(3*R*,3a*S*,6a*R*)-hexahydrofuro[2,3-*b*]furan-3-ol

and where the reaction is carried out in the presence of a catalyst comprising a lanthanide or transition metal complexed to a chiral ligand.

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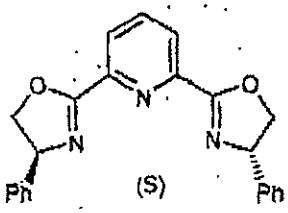
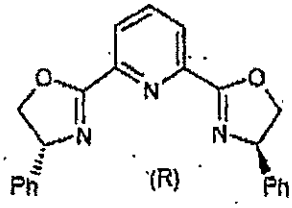
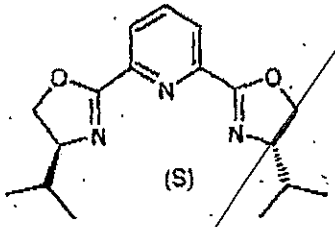
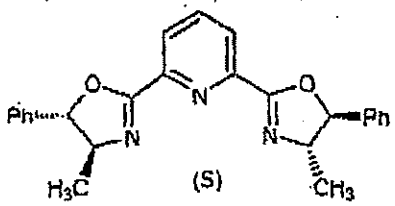
6. The process of claim 5, where the chiral ligand is









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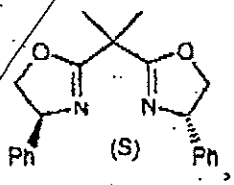

where,

Ph is phenyl.

7. The process of claim 1, which is carried out in the presence of a solvent.

8. The process of claim 7, where the solvent is a polar aprotic solvent.

9. The process of claim 8, where the solvent is methyl-t-butyl-ether, dichloromethane or a mixture thereof.

10. The process of claim 1, which is carried out in the presence of excess 2,3-dihydrofuran as a solvent.

11. The process of claim 1, where the catalyst comprises Sc.

12. The process of claim 1, where the catalyst comprises Yb.

13 The process of claim 1, further comprising,

(i) combining the bisfuran alcohol of Formula 0 with disuccinimidyl dicarbonate to form a compound of Formula L1:

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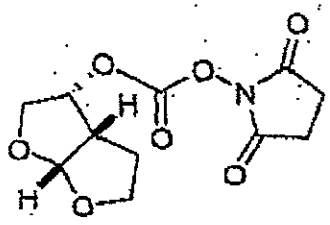
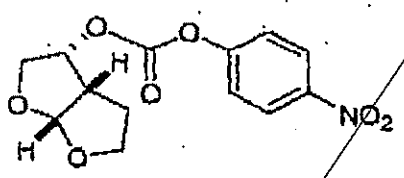


Formula L1;

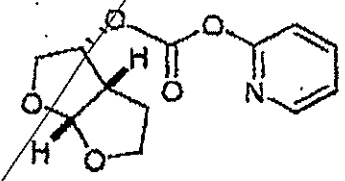
(ii) combining the bisfuran alcohol of Formula 0 with bis(*p*-nitro)phenyl carbonate or *p*-nitrophenol chloroformate to form a compound of Formula L2:



Formula L2;

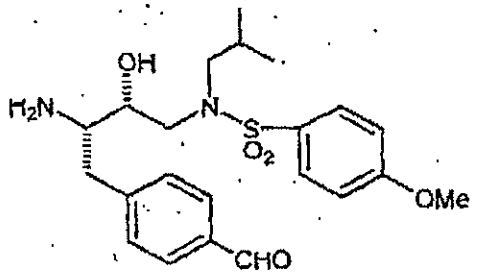
or

(iii) combining the bisfuran alcohol of Formula 0 with dipyridyl carbonate to form a compound of Formula L3:



Formula L3.

14. The process of claim 13, further comprising, combining the compound of Formula L1, L2 or L3 with a compound of Formula N,



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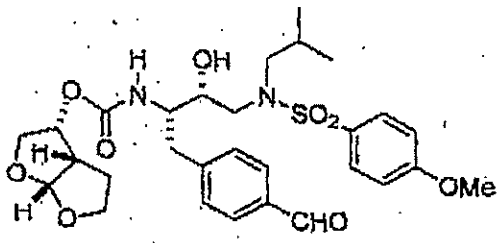
Formula N,

to form a compound of Formula A,

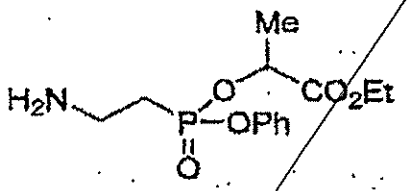


Formula A,

where,

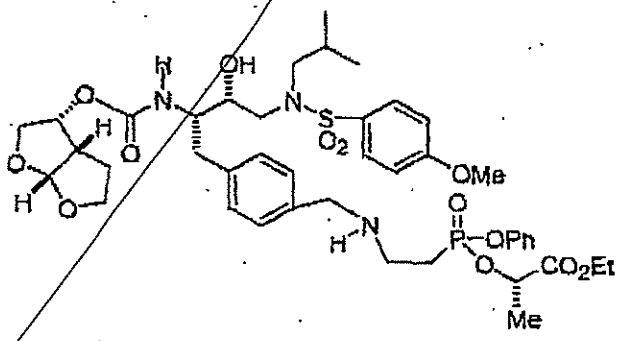
Me is methyl.

15. The process of claim 14, further comprising, combining the compound of Formula A with a compound of Formula J,



Formula J,

to form a compound of Formula I,



Formula I,

where,

Me is methyl;

Et is ethyl; and

Ph is phenyl.

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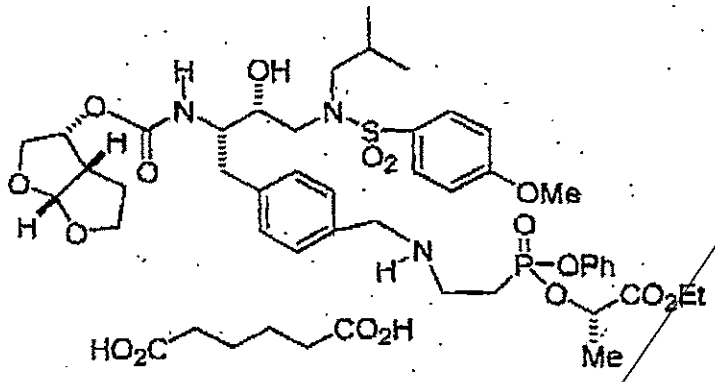
16. The process of claim 15, further comprising, combining the compound of Formula I with adipic acid to form a salt of Formula IV,

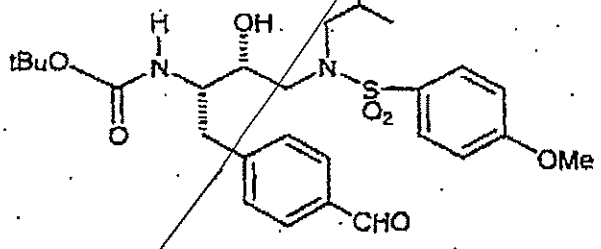


Formula IV,

where,

Me, Et and Ph are each independently defined the same as in claim 15.

17. The process of claim 14, where the compound of Formula N is prepared by deprotecting a compound of Formula M:



Formula M.

18. The process of claim 17, where the deprotection is accomplished by combining the compound of Formula M with a deprotecting agent which is selected from trifluoroacetic acid, hydrochloric acid, toluenesulfonic acid, methanesulfonic acid, benzenesulfonic acid, or hydrobromic acid.

19. The process of claim 17, where the compound of Formula M is prepared by reducing a compound of Formula C:

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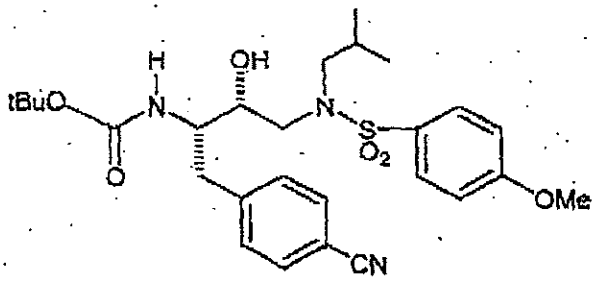
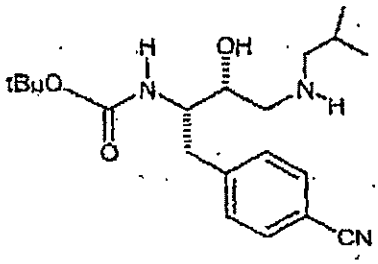


Formula C.

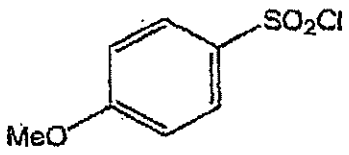
20. The process of claim 19, where the reduction is accomplished by contacting the compound of Formula C with a reducing agent which is lithium aluminum hydride, sodium borohydride, lithium borohydride, sodium triacetoxyborohydride, sodium cyanoborohydride, potassium triisopropoxy borohydride or diisobutyl aluminum hydride

21. The process of claim 19, where the compound of Formula C is prepared by combining a compound of Formula F with a compound of Formula G:



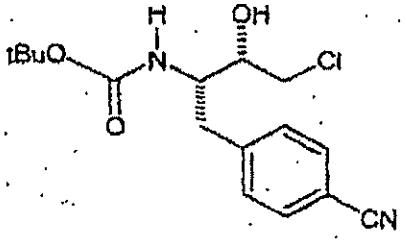
Formula F

;



Formula G.

22. The process of claim 21, where the compound of Formula F is prepared by combining a compound of Formula E with an amine:



Formula E.

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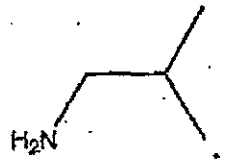
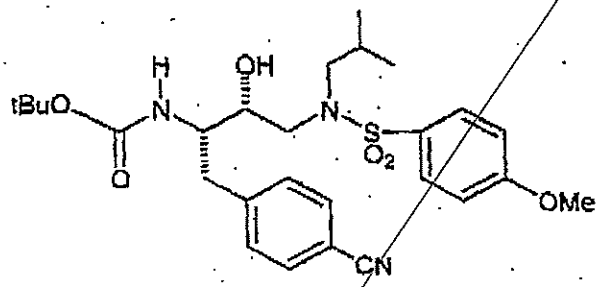
23. The process of claim 22, where the amine is



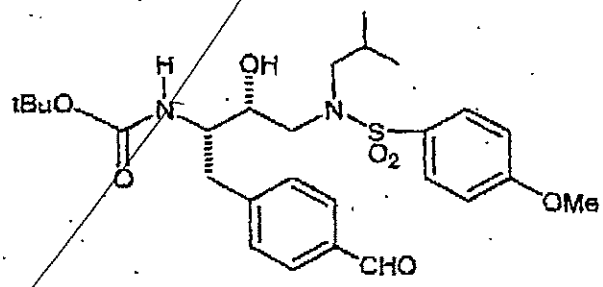
24. A compound having the formula C:



Formula C,

or a pharmaceutically acceptable salt thereof.

25. A compound having the formula M:



Formula M,

or a pharmaceutically acceptable salt thereof.

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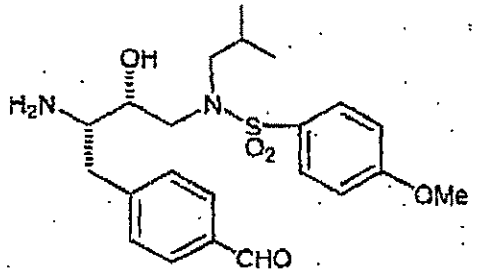
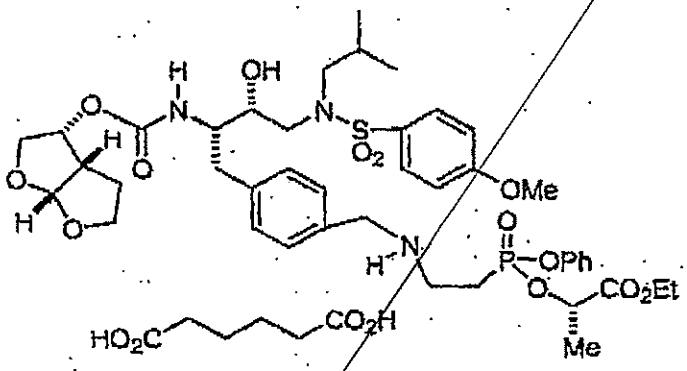
26. A compound having the formula N:



Formula N,

or a pharmaceutically acceptable salt thereof.

27. A salt having the formula IV:



Formula IV.

28. A pharmaceutical composition comprising the salt of claim 27 and an excipient, diluent or carrier.

29. A method for the treatment or prophylaxis of a retrovirus infection in a patient, comprising administering to the patient a therapeutically effective amount of the salt of claim 27.

30. The method of claim 29, where the retrovirus is human immunodeficiency virus (HIV).

31. The method of claim 29, where the therapeutically effective amount is about 10 mg to about 2000 mg.

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32. The method of claim 29, where the salt is administered in a pharmaceutical composition.

33. The method of claim 32, where the pharmaceutical composition is in a unit dosage form of a tablet.

34. The method of claim 29, where the salt is administered orally.

35. A compound, composition or method as disclosed herein.

36. The use of the salt of claim 27 for the manufacture of a medicament for inhibiting activity of a retrovirus protease in a patient, comprising administering to the patient a therapeutically effective amount of the salt.

37. The use of the salt of claim 27 for the manufacture of a medicament for the treatment or prophylaxis of a retrovirus infection in a patient, comprising administering to the patient a therapeutically effective amount of the salt.

38. The use of claim 36 or 37, where the retrovirus is human immunodeficiency virus (HIV).

39. The use of the salt of claim 36 or 37, where the salt is administered to the patient as a single composition.

40. The use of the salt of claim 36 or 37, where the salt is administered to the patient orally.

41. The use of claim 40, where the oral administration is once a day.

42. The use of claim 36 or 37, where the patient is also receiving one or more agents selected the group consisting of stavudine, emtricitabine, tenofovir, emtricitabine, abacavir, lamivudine, zidovudine, didanosine, zalcitabine, phosphazide,

efavirenz, nevirapine, delavirdine, tipranavir, saquinavir, indinavir, atazanavir, nelfinavir, amprenavir, samprenavir, lopinavir, ritonavir, enfuvirtide, Fozivudine tidoxil, Alovudine, Dexelvucitabine, Apricitabine, Amdoxovir, Elvucitabine (ACH126443), Racivir (racemic FTC, PSI-5004), MIV-210, KP-1461, fosalvudine tidoxil (HDP 99.0003), AVX756, Dioxolane Thymine (DOT), TMC-254072, INK-20, 4'-Ed4T, TMC-125 (etravirine), Capravirine, TMC-278 (rilpivirine), GW-695634, Calanolide A, BILR 355 BS, and VRX 840773, and pharmaceutically acceptable salts thereof.

43. The use of claims 36 or 37, where the therapeutically effective amount is about 10 mg to about 2000 mg.

44. The use of claim 36 or 37, where the salt is administered in a pharmaceutical composition.

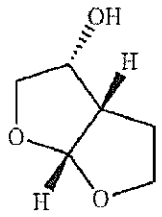
45. The use of claim 44, where the pharmaceutical composition is in a unit dosage form of a tablet.

46. The use of claim 45, where the salt is administered orally.

What is claimed is:

1. A process for preparing a bisfuran alcohol of Formula 0:

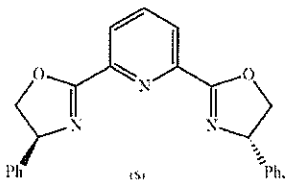
Formula 0

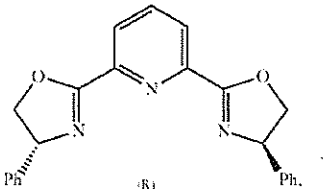


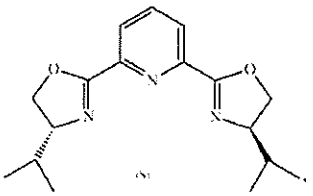
(3R,3aS,6aR)-hexahydrofuro[2,3-b]furan-3-ol,

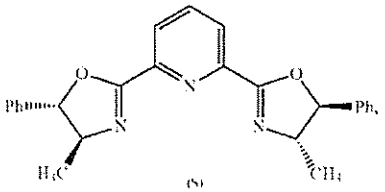
comprising, reacting 2,3-dihydrofuran and a glycoaldehyde or glycoaldehyde dimer in the presence of a lanthanide or transition metal catalyst to form the bisfuran alcohol of Formula 0.

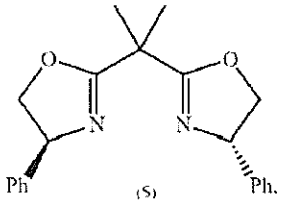
2. The process of claim 1, where the catalyst comprises Yb, Pr, Cu, Eu or Sc complexed to a ligand selected from:

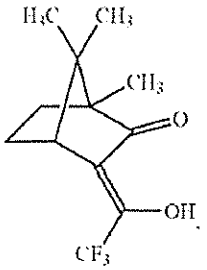


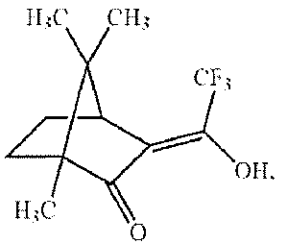


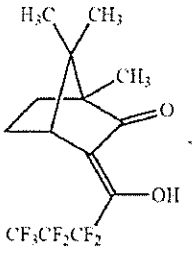


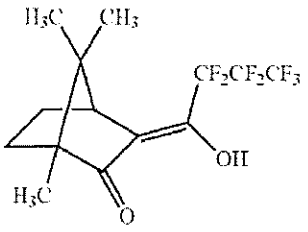




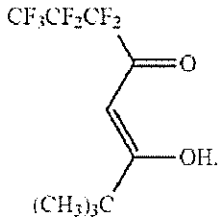






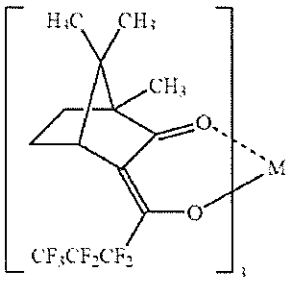


or

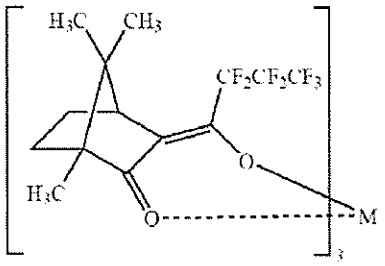


3. The process of claim 2, where the catalyst is Yb(hfc)$_3$(+), Yb(hfc)$_3$(−), Eu(hfc)$_3$(+), Eu(hfc)$_3$(−), Yb(fod)$_3$(+) and S-Binaphthol, Yb(tfc)$_3$(+), Sc(OTf)$_3$ and (S)-pybox, and Pr(tfc)$_3$(+) where

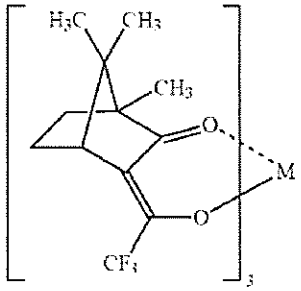
M(hfc)$_3$(-) =



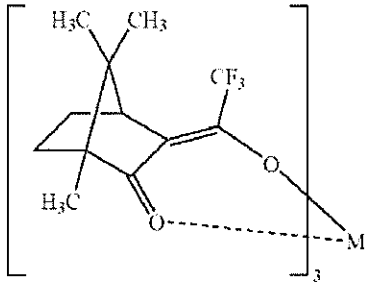
M(hfc)$_3$(+) =



M(tfc)$_3$(-) =

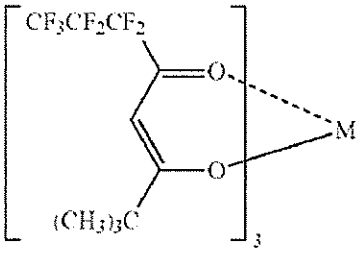


M(tfc)$_3$(+) =



and

M(fod)$_3$ =

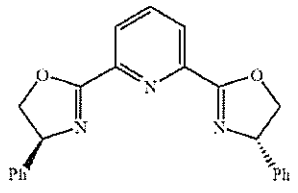


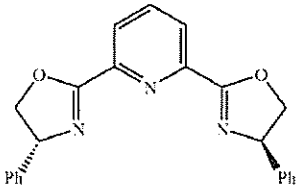
where, M represents Yb, Pr, Cu, Eu or Sc.

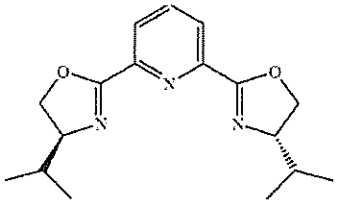
4. The process of claim 1, where the reaction is carried out at a temperature of between about 0° C. to about 100° C.

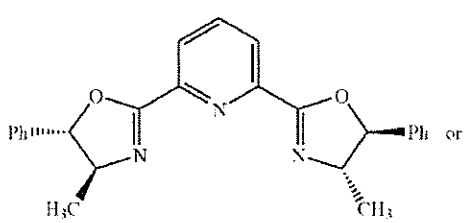
5. The process of claim 1, where the reaction is carried out in the presence of a catalyst comprising a lanthanide or transition metal complexed to a chiral ligand.

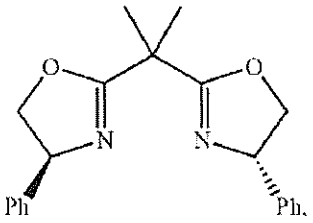
6. The process of claim 5, where the chiral ligand is









or


where,

Ph is phenyl.

7. The process of claim 1, which is carried out in the presence of a solvent.

8. The process of claim 7, where the solvent is a polar aprotic solvent.

9. The process of claim 8, where the solvent is methyl-t-butyl-ether, dichloromethane or a mixture thereof.

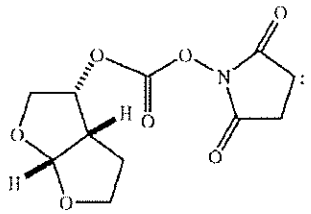
10. The process of claim 1, which is carried out in the presence of excess 2,3-dihydrofuran as a solvent.

11. The process of claim 1, where the catalyst comprises Sc.

12. The process of claim 1, where the catalyst comprises Yb.

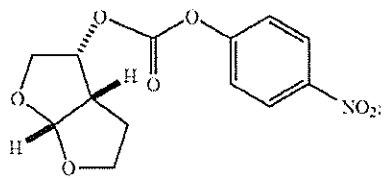
13. The process of claim 1, further comprising,
(i) combining the bisfuran alcohol of Formula 0 with disuccinimidyl dicarbonate to form a compound of Formula L1:

Formula L1



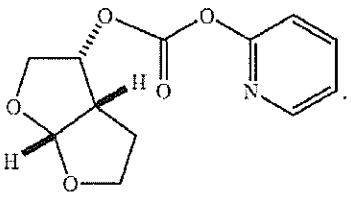
(ii) combining the bisfuran alcohol of Formula 0 with bis(p-nitro)phenyl carbonate or p-nitrophenol chloroformate to form a compound of Formula L2:

Formula L2



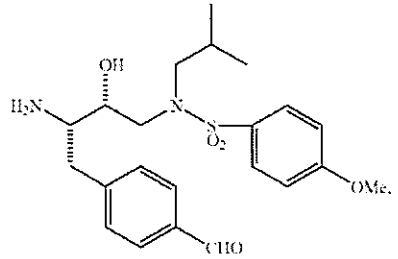
or (iii) combining the bisfuran alcohol of Formula 0 with dipyridyl carbonate to form a compound of Formula L3:

Formula L3



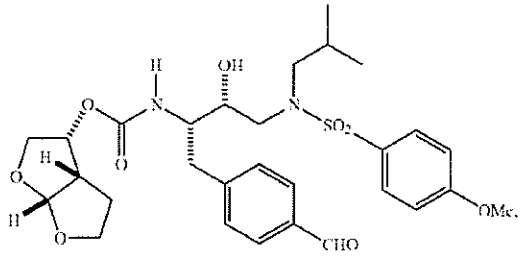
14. The process of claim 13, further comprising, combining the compound of Formula L1, L2 or L3 with a compound of Formula N,

Formula N



to form a compound of Formula A,

Formula A

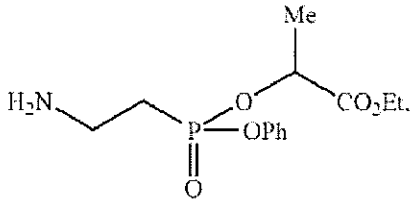


where,

Me is methyl.

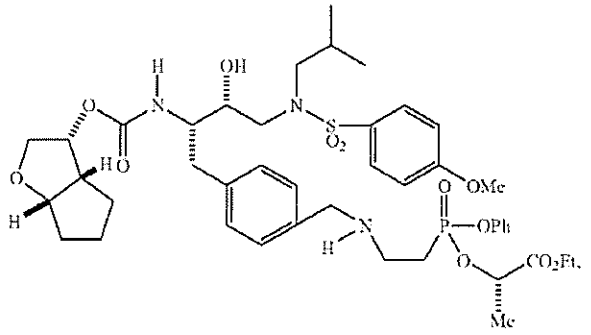
15. The process of claim 14, further comprising, combining the compound of Formula A with a compound of Formula J,

Formula J



to form a compound of Formula I,

Formula I



where,

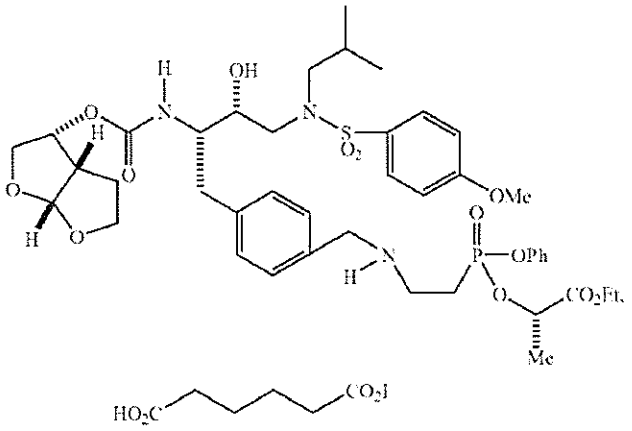
Me is methyl;

Et is ethyl; and

Ph is phenyl.

16. The process of claim 15, further comprising, combining the compound of Formula I with adipic acid to form a salt of Formula IV,

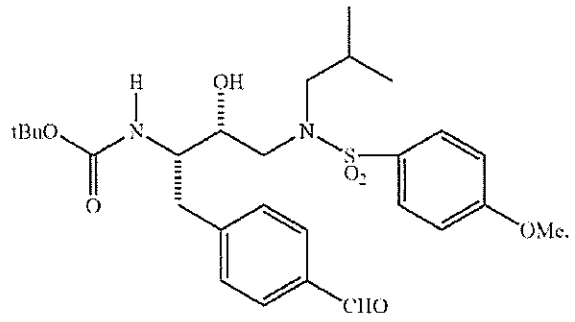
Formula IV



where, Me, Et and Ph are each independently defined the same as in claim 15.

17. The process of claim 14, where the compound of Formula N is prepared by deprotecting a compound of Formula M:

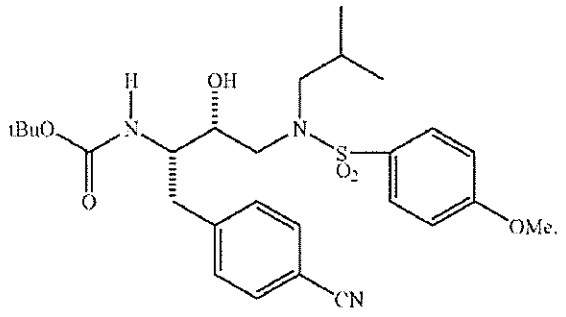
Formula M



18. The process of claim 17, where the deprotection is accomplished by combining the compound of Formula M with a deprotecting agent which is selected from trifluoroacetic acid, hydrochloric acid, toluenesulfonic acid, methanesulfonic acid, benzenesulfonic acid, or hydrobromic acid.

19. The process of claim 17, where the compound of Formula M is prepared by reducing a compound of Formula C:

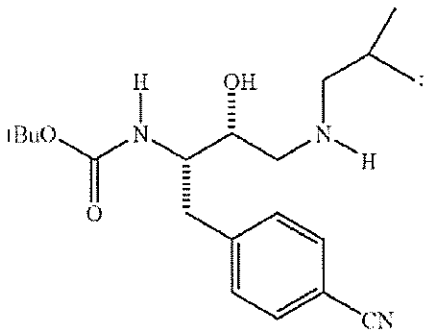
Formula C



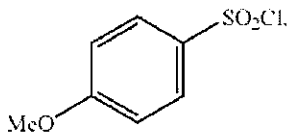
20. The process of claim 19, where the reduction is accomplished by contacting the compound of Formula C with a reducing agent which is lithium aluminum hydride, sodium borohydride, lithium borohydride, sodium trisacetoxyborohydride, sodium cyanoborohydride, potassium triisopropoxy borohydride or diisobutyl aluminum hydride.

21. The process of claim 19, where the compound of Formula C is prepared by combining a compound of Formula F with a compound of Formula G:

Formula F

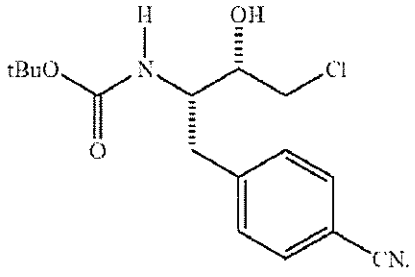


Formula G



22. The process of claim 21, where the compound of Formula F is prepared by combining a compound of Formula E with an amine:

Formula E



23. The process of claim 22, where the amine is

