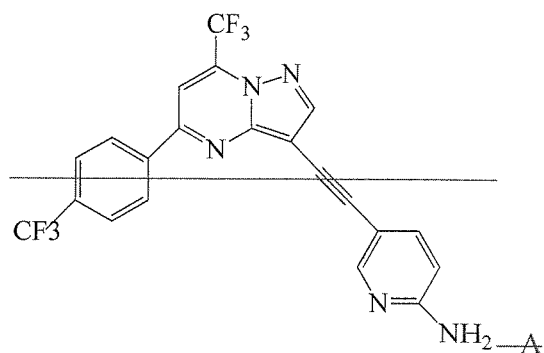


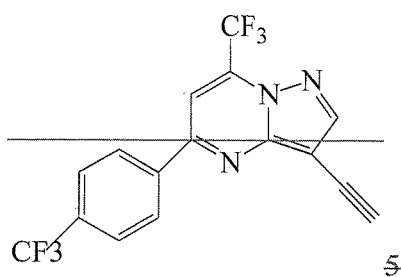
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Claims:

1. A method for preparing compound A having the formula:

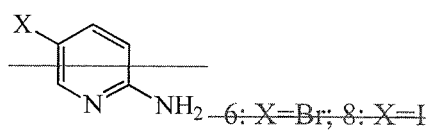


which comprises reacting compound 5;



10

with compound 6 or 8;

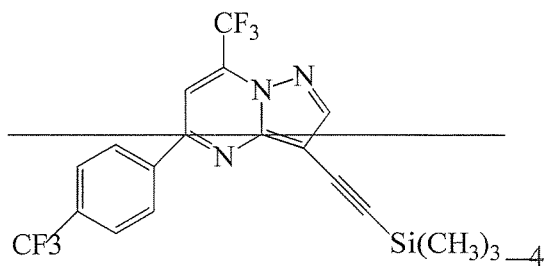


via a Sonogashira coupling reaction in an inert solvent to provide compound A.

2. The method according to claim 1, wherein compound 5 is prepared by desilylating compound 4;

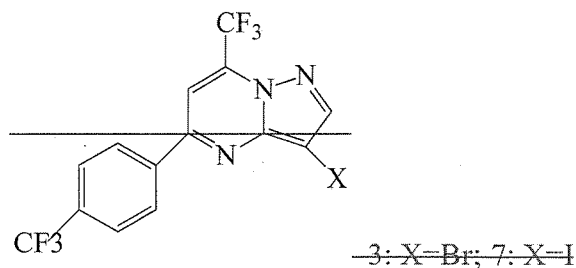
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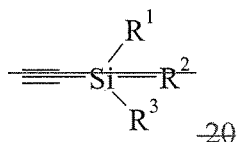


in an inert solvent.

3. The method according to claim 2, wherein compound 4 is prepared by reacting compound 3 or 7;



10 with compound 20



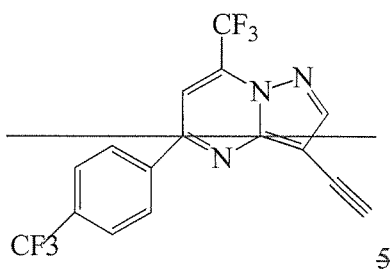
wherein R^1 , R^2 , and R^3 are each independently C_{1-6} -alkyl or aryl, via a Sonogashira coupling reaction in an inert solvent.

4. The method according to any one of claims 1 to 3 wherein compound 20 is trimethylsilylacetylene.

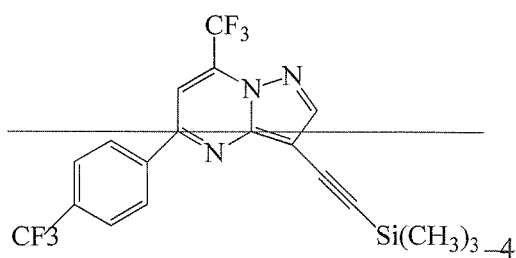
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5. A method for preparing compound 5 having the formula:

5

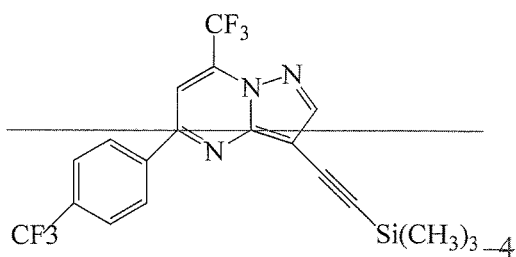


which comprises desilylating compound 4;



in an inert solvent to provide compound 5.

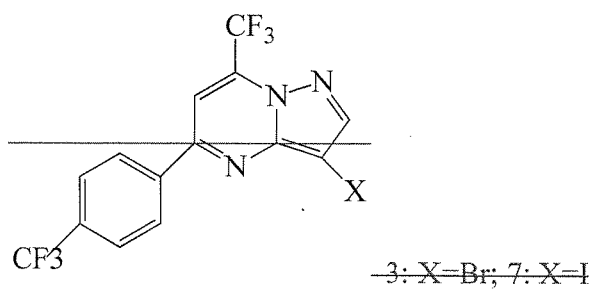
6. — A method for preparing compound 4 having the formula:



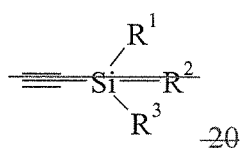
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which comprises reacting compound 3 or 7;

5



with compound 20

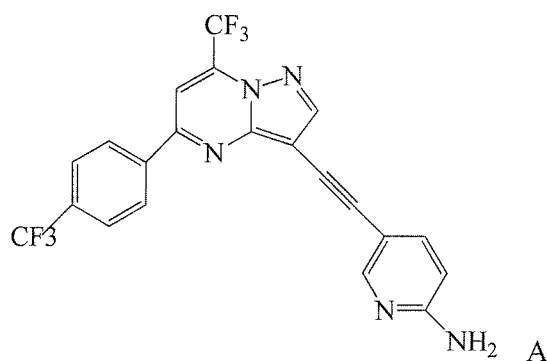


wherein R^1 , R^2 , and R^3 are each independently C_{1-6} -alkyl or aryl, via a Sonogashira coupling reaction in an inert solvent.

10 7. The method according to claim 6 wherein compound 20 is trimethylsilylacetylene.

Claims:

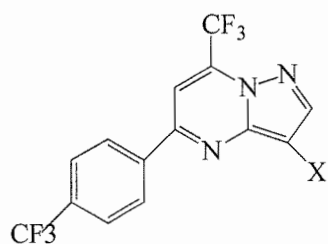
8.1. A method for preparing compound A having the formula:



which comprises reacting compound 3 or 7;

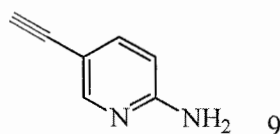
15

5



3: X=Br; 7: X=I

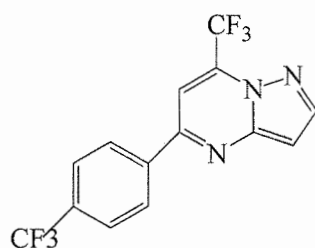
with compound 9;



9

via a Sonogashira coupling reaction in an inert solvent to provide compound A₂.

9. ~~The method according to claim 8, wherein compound 7 is prepared by reacting~~
 10 compound 11;



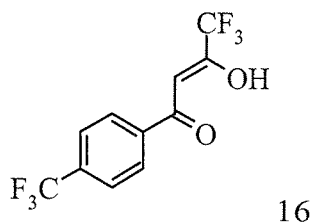
11

with an iodinating agent under acidic conditions to provide compound 7₂.

10. ~~The method according to claim 8 or 9, wherein the iodinating agent is N-~~
 iodosuccinimide.

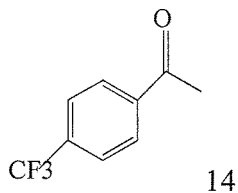
15 ~~11.2.~~ The method according to ~~any one of claims 8 to 10~~ 1, wherein compound 11 is prepared
 by reacting compound 16;

5



with 3-aminopyrazole in an inert solvent to provide compound 11.

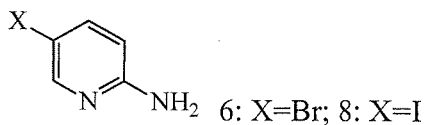
~~12.3.~~ The method according to ~~any one of claims 8 to 11~~ or 2, wherein compound 16 is prepared by reacting compound 14



10 with ethyl trifluoroacetate under basic conditions in an inert solvent to provide compound.

~~13.4.~~ The method according to claim 81, wherein compound 9 is prepared by

(a) reacting compound 6 or 8



15 with 2-methyl-3-butyn-2-ol via a Sonogashira coupling reaction to provide compound 13

and

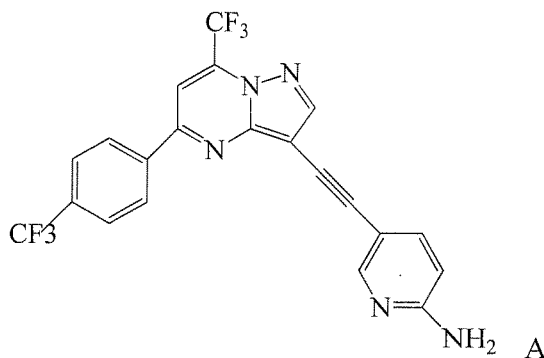
(b) deprotecting compound 13 with a base in an inert solvent to provide compound 9.

5 | ~~14.5.~~ The method of claim ~~8-1~~ or ~~134~~, which further comprises extracting compound 9 into MeTHF without isolation and adding compound 7 to provide compound A via Sonogashira coupling.

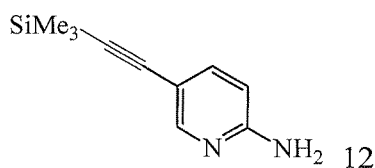
| ~~15.6.~~ The method according to any of claims ~~81~~, ~~134~~, or ~~145~~, wherein compound 8 is reacted with 2-methyl-3-butyn-2-ol in the presence of $\text{PdCl}_2(\text{PPh}_3)_2\text{-CuI}$ catalyst.

10 | ~~16.7.~~ The method according to claim ~~81~~, ~~134~~, or ~~145~~, wherein compound 6 is reacted with 2-methyl-3-butyn-2-ol in the presence of a $\text{Pd}(\text{OAc})_2/\text{PPh}_3\text{-CuI}$ catalyst.

| ~~17.8.~~ A method for preparing compound A having the formula:

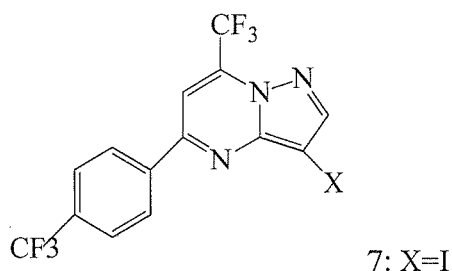


which comprises reacting compound 12, set below;



with compound 7;

5



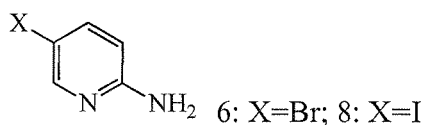
in an inert solvent in the presence of potassium fluoride to provide compound A.

~~18.9.~~ The method according to claim ~~178~~, wherein reacting compound 12 with compound 7 is carried out in the presence of a water-scavenging agent.

10

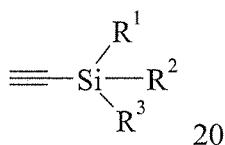
~~19.10.~~ The method according to claim ~~17-8~~ or ~~189~~, wherein the water-scavenging agent is 1,1,1,3,3,3-hexamethyldisilazane.

~~20.11.~~ The method according to any one of claims ~~17-8~~ to ~~1910~~, wherein compound 12 is prepared by reacting compound 6 or 8;



with compound 20

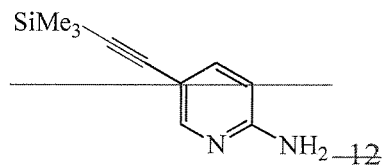
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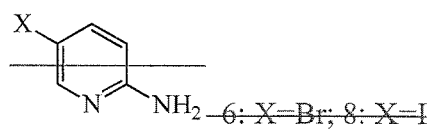
wherein R^1 , R^2 , and R^3 are each independently C_{1-6} -alkyl or aryl, via a Sonogashira coupling reaction in an inert solvent to provide compound 12.

~~21.12.~~ The method according to any one of claims ~~17-8~~ to ~~20-11~~ wherein compound 20 is trimethylsilylacetylene.

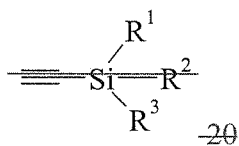
5 22. ~~A method for preparing compound 12 having the formula:~~



~~which comprises reacting compound 6 or 8;~~



~~with compound 20~~



10

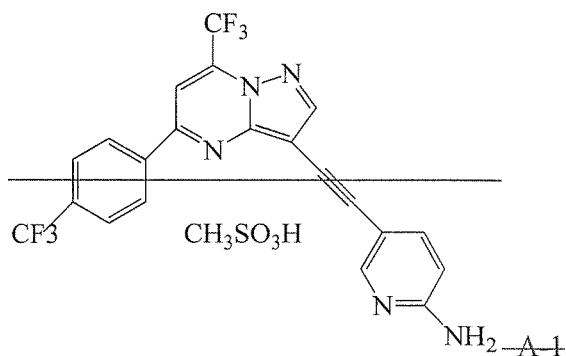
~~wherein R^1 , R^2 , and R^3 are each independently C_{1-6} alkyl or aryl, via a Sonogashira coupling reaction in an inert solvent to provide compound 12.~~

23. ~~The method of claim 22 wherein compound 20 is trimethylsilylacetylene.~~

24. ~~A method for preparing compound A-1 having the formula:~~

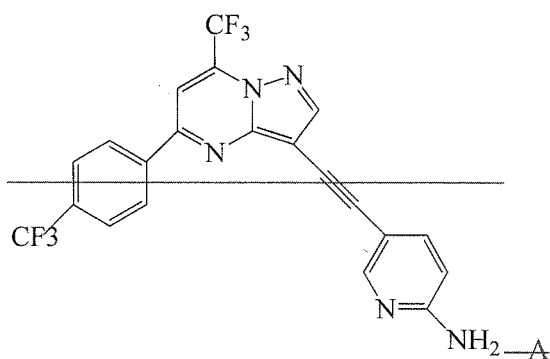
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which comprises:

(a) dissolving compound A;



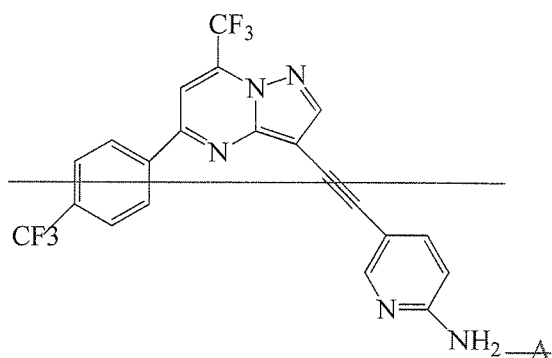
in a solvent to form a solution;

10 (b) treating the solution from step (a) with a phosphine of formula PR_3 wherein R is C_{1-6} -alkyl or aryl; and

(c) adding an acid selected from the group consisting of methanesulfonic acid, HCl , $p\text{-TsOH}$, H_2SO_4 , H_3PO_4 , and HBr to the reaction mixture from step (b) to precipitate compound A-1.

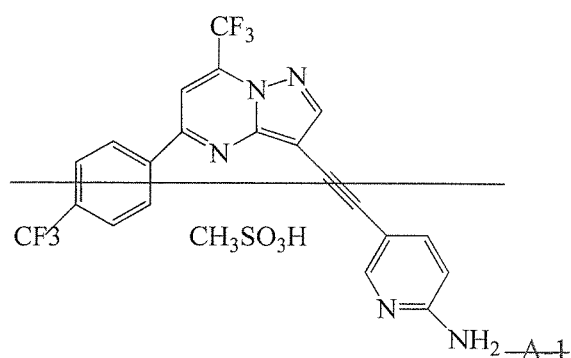
15 25. The method according to claim 24 wherein the solvent in step (a) is tetrahydrofuran, 2-MeTHF, ethyl acetate, methyl t-butyl ether or acetonitrile.

- 5 26. ~~The method according to claim 24 or 25 wherein the solvent is tetrahydrofuran.~~
27. ~~The method according to any one of claims 24 to 26 wherein the phosphine of setp (b) is n-tributylphosphine.~~
28. ~~The method according to any one of claims 24 to 27 wherein the acid in step (c) is methanesulfonic acid.~~
- 10 29. ~~A method for purifying compound A having the formula:~~



~~which comprises:~~

~~(a) slurrying compound A-1;~~



15 ~~in an inert solvent to form an organic mixture;~~

5 (b) treating the organic mixture from step (a) with an aqueous alkaline solution to convert compound A-1 to free base compound A, resulting in an aqueous phase and an organic phase containing the free base compound A;

(c) separating the aqueous and organic phases from step (b) and washing the organic phase with water; and

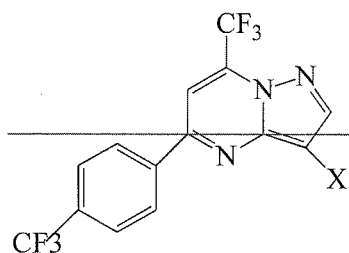
10 (d) separating and concentrating the organic phase from step (c) to provide purified compound A.

30. The method according to claim 29 wherein the inert solvent in step (a) is 2-methyltetrahydrofuran.

31. The method according to claim 29 or 30, wherein the aqueous alkaline solution in step (b) is an aqueous sodium carbonate solution.

32. The method according to any one of claims 29 to 31, further comprising conducting a solvent exchange on the organic phase after step (c) to isopropanol to provide crystalline compound A.

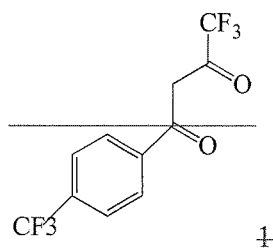
33. A method for preparing compound 3 or 7 having the formula:



3: X=Br; 7: X=I

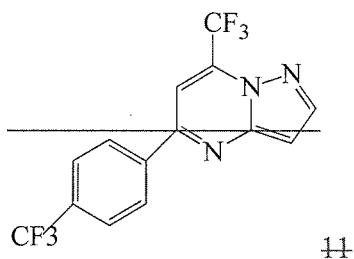
which comprises converting compound 1;

5



to compound 11 via a condensation reaction; and

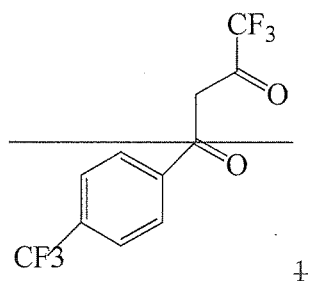
reacting compound 11;



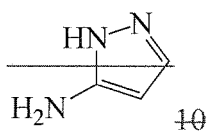
with a halogenating agent to provide compound 3 or 7.

- 10 34. The method according to claim 33, wherein the halogenating agent is N-bromosuccinimide to provide compound 3.
35. The method according to claim 33 or 34, wherein the halogenating agent is iodine chloride to provide compound 7.
- 15 36. The method according to any one of claims 33 to 35, wherein the halogenating agent is N-iodosuccinimide to provide compound 7.
37. The method according to any one of claims 33 to 36, wherein the halogenating agent is $I_2/NaIO_4/HCl$ to provide compound 7.

- 5 38. ~~The method according to any one of claims 33 to 37 wherein compound 11 is prepared by reacting compound 1~~

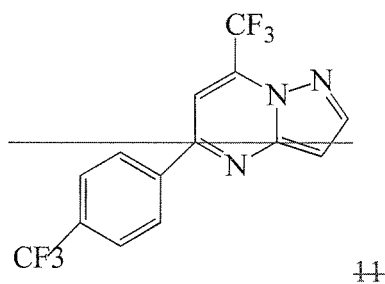


with compound 10;



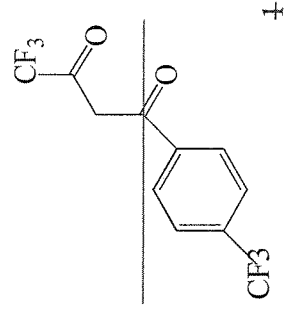
- 10 via a condensation reaction to provide compound 11.

39. ~~A method for preparing compound 11 having the formula:~~

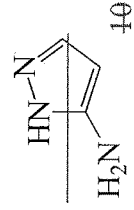


which comprises reacting compound 1;

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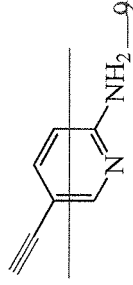


with compound 10;



via a condensation reaction to provide compound 11:

40. A method for preparing compound 9 having the formula:



10

which comprises:

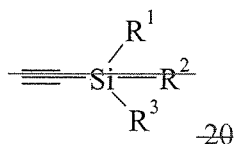
(a) reacting compound 6 or 8;



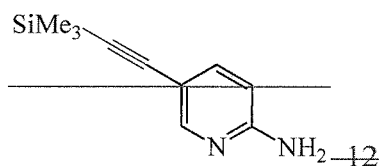
with compound 20

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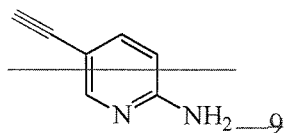
wherein R^1 , R^2 , and R^3 are each independently C_{1-6} -alkyl or aryl, via a Sonogashira coupling reaction in an inert solvent to provide compound 12; and



(b) desilylating compound 12 in an inert solvent to provide compound 9.

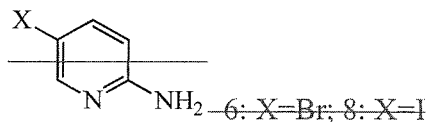
41. The method according to claim 40 wherein compound 20 is trimethylsilylacetylene.

42. A method for preparing compound 9 having the formula:



which comprises:

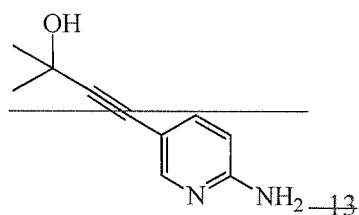
(a) reacting compound 6 or 8;



15

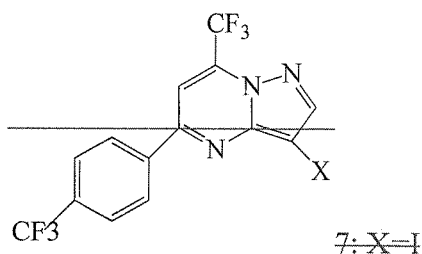
with 2-methyl-3-butyne-2-ol via a Sonogashira coupling reaction in an inert solvent to provide compound 13; and

5

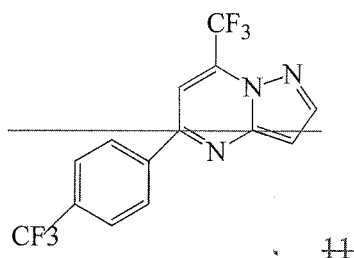


(b) deprotecting compound 13 with a base in an inert solvent to provide compound 9.

43. A method for preparing compound 7 having the formula:



which comprises reacting compound 11;



10

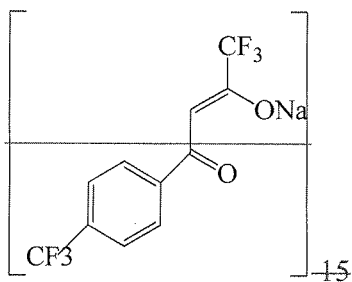
with an iodinating agent under acidic conditions to provide compound 7.

44. The method according to claim 43, wherein the iodinating agent is N-iodosuccinimide.

45. The method according to claim 43 or 44, wherein the iodinating agent is $I_2/NaIO_4/HCl$.

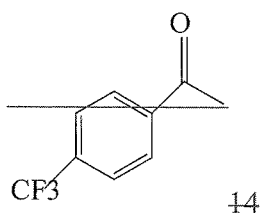
46. The method according to any one of claims 43 to 45, wherein compound 11 is prepared by reacting compound 15;

15



with 3-aminopyrazole in an inert solvent to provide compound 11.

47. The method according to any one of claims 43 to 46, wherein compound 15 is prepared by reacting compound 14;



- with ethyl trifluoroacetate under basic conditions in an inert solvent to provide compound 15.