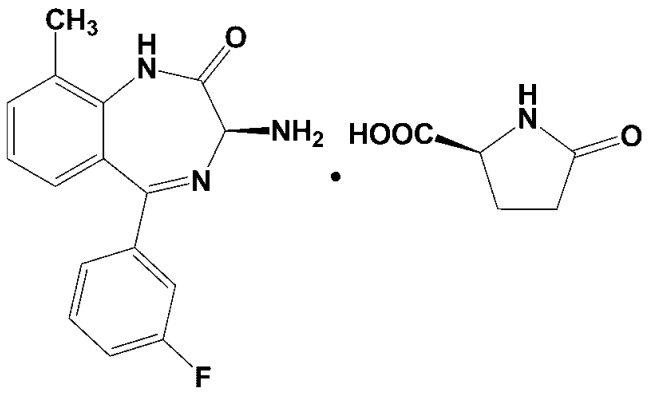
CLAIMS

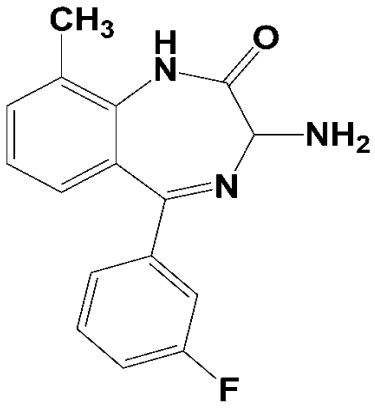
What is claimed is:

1. A method of preparing Compound (1b),



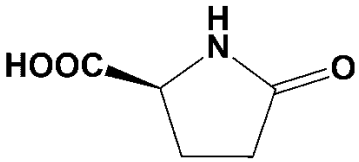
Compound (1b)

comprising the step of: reacting Compound (1a)



Compound (1a)

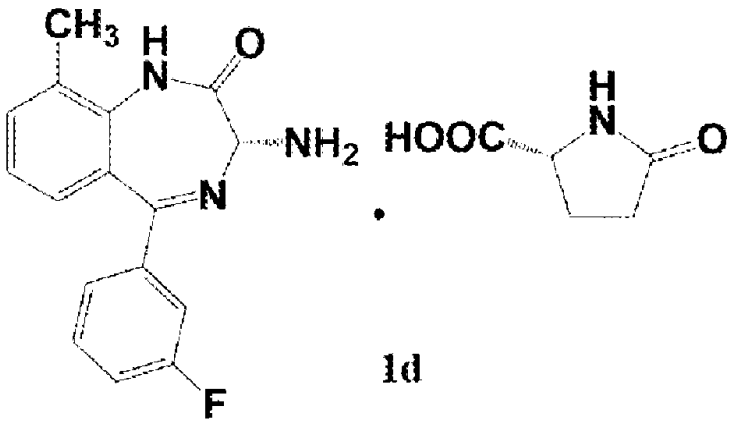
with L-pyroglutamic acid (L-PGA),



L-pyroglutamic acid (L-PGA),

in the presence of solvent; with or without catalyst to obtain Compound (1b); and optionally wherein the yield of Compound (1b) is greater than 50%.

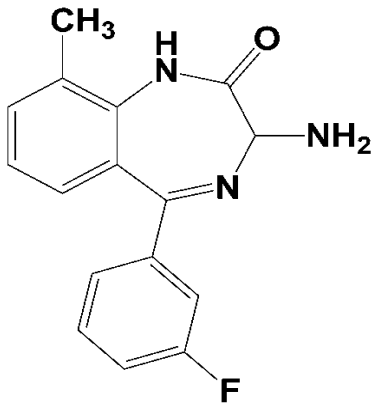
2. A method of preparing Compound (1d),



1d

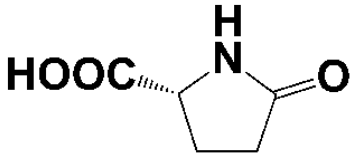
Compound (1d)

comprising the steps of: reacting Compound (1a)



Compound (1a)

with D-pyroglutamic acid (D-PGA),



D-pyroglutamic acid (D-PGA)

in the presence of solvent; with or without catalyst to obtain Compound (1d); and optionally wherein the yield of Compound (1d) is greater than 50%.

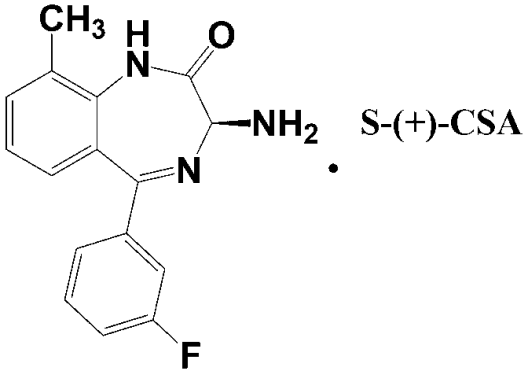
3. The method according to claim 1 or claim 2, wherein the catalyst comprises benzaldehyde, salicylaldehyde, 3,5-dichlorosalicylaldehyde, p-nitrobenzaldehyde, or any combination thereof.

4. The method according to any one of claims 1-3, wherein 0.001 to 1.0 mole equivalents of the catalyst compared to Compound (1a) are used.

5. The method according to any one of claims 1-4, wherein the solvent comprises an alcoholic solvent; an ester solvent; an ether solvent; a hydrocarbon solvent; a polar aprotic solvent; a ketone solvent; a chloro solvent; a nitrile solvent; a polar solvent; or any combination thereof.

6. The method according to any one of claims 1-5, wherein the reaction is conducted at a temperature between 0-100 ºC.

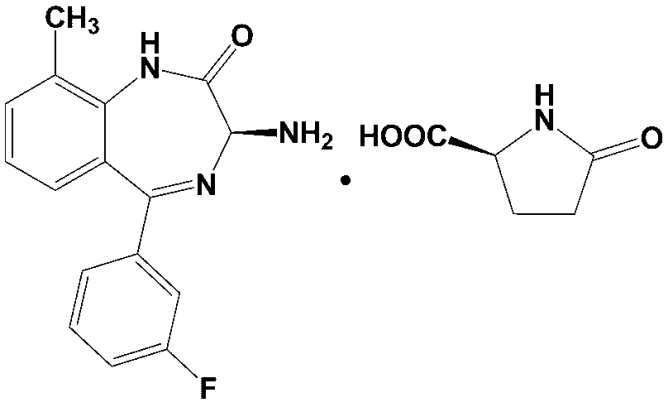
7. A method of preparing Compound (1c),



Compound (1c)

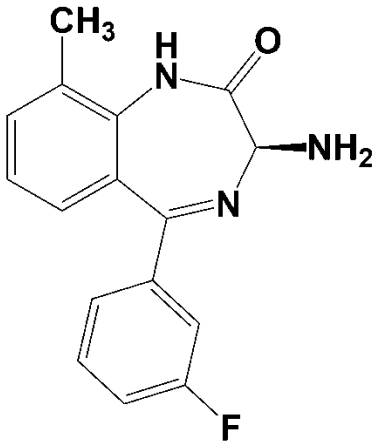
comprising the steps of:

a) reacting Compound (1b):



Compound (1b)

with a base and solvent to provide Compound (1); and



Compound (1)

b) reacting Compound (1) with

S (+) camphor sulfonic acid (CSA)

to provide Compound (1c).

8. The method according to claim 7, wherein the base comprises an inorganic base, an organic base, or any combination thereof.

9. The method according to claim 7 or claim 8, wherein the solvent comprises an alcoholic solvent; an ester solvent; an ether solvent; a hydrocarbon solvent; a polar aprotic solvent; a ketone solvent; a chloro solvent; a nitrile solvent; a polar solvent; or any combination thereof.

10. The method according to any one of claims 7-9, wherein the reaction of step (a) is conducted at a temperature between 0-45 ºC.

11. The method according to any one of claims 1-10, wherein the chiral purity of Compound (1), (1b), (1c) or (1d) is greater than 99%.