WE CLAIM:

1. A process for making zilpaterol or a salt thereof, wherein the process comprises:

making chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) by a process comprising reacting 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) with at least one chlorinating agent selected from the group consisting of oxalyl chloride, phosgene, and triphosgene; or

making 4,5-dihydro-imidazo[4,5,1-jk][1]benzazepin-2,6,7[1H]-trione-6-oxime (or a salt thereof) by a process comprising reacting 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione (or a salt thereof) with an inorganic nitrite.

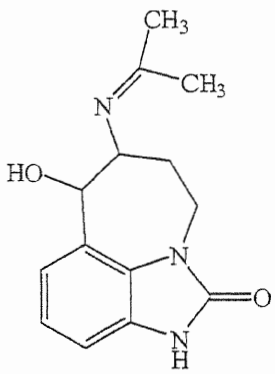
2. The process according to claim 1, wherein the process comprises making chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) by a process comprising reacting 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) with at least one chlorinating agent selected from the group consisting of oxalyl chloride, phosgene, and triphosgene

3. The process according to any one of claims 1 and 2, wherein the process comprises making 4,5-dihydro-imidazo[4,5,1-jk][1]benzazepin-2,6,7[1H]-trione-6-oxime (or a salt thereof) by a process comprising reacting 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione (or a salt thereof) with an inorganic nitrite.

4. The process according to any one of claims 1, 2, and 3, wherein:

the process further comprises reacting an isopropylideneamino compound (or a salt thereof) with H_2 in the presence of a hydrogenation catalyst, and

the isopropylideneamino compound corresponds in structure to Formula (WO-1):

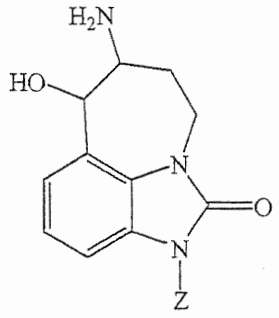


(WO-1).

5. The process according to claim 4, wherein:

at least a portion of the isopropylideneamino compound reacted with H_2 is made by a process comprising combining an aminoalcohol salt with acetone and acetic acid,

the aminoalcohol salt corresponds in structure to Formula (WO-2):



(WO-2), and

Z is a cation.

6. A process for making chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate or a salt thereof, wherein the process comprises reacting 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) with at least one chlorinating agent selected from the group consisting of oxalyl chloride, phosgene, and triphosgene.

7. A process for making 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione or a salt thereof, wherein the process comprises:

making chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) by a process comprising reacting 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) with at least one chlorinating agent selected from the group consisting of oxalyl chloride, phosgene, and triphosgene; and

reacting chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) with a Lewis acid.

8. The process according to claim 7, wherein the Lewis acid comprises $AlCl_3$.

9. The process according to claim 7, wherein the process comprises:

making chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) by a process comprising reacting 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) with oxalyl chloride;

making a product mixture comprising 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione (or a salt thereof) by a process comprising:

combining chloro 2,3-dihydro-2-oxo-1H-benzimidazol-1-butanoate (or a salt thereof) with $AlCl_3$, and

combining the resulting mixture with an acid;

separating 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione from the product mixture; and

separating $Al(OH)_3$ from at least a portion of the remaining product mixture by a process comprising combining at least a portion of the remaining product mixture with a base.

10. A process for making 4,5-dihydro-imidazo[4,5,1-jk][1]benzazepin-2,6,7[1H]-trione-6-oxime or a salt thereof, wherein the process comprises reacting 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione (or a salt thereof) with an inorganic nitrite.

11. The process according to any one of claims 1, 2, 3, 4, 5, 6, 7, 8, and 9, wherein 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) is reacted with the chlorinating agent in the presence of dichloromethane.

12. The process according to any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 9, and 11, wherein 4-(2-oxo-2,3-dihydrobenzimidazol-1-yl)butyric acid (or a salt thereof) is reacted with the chlorinating agent in the presence of a catalytic amount of dimethylformamide.

13. The process according to any one of claims 1, 2, 3, 4, 5, 6, 7, 8, 11, and 12, wherein the chlorinating agent comprises oxalyl chloride.

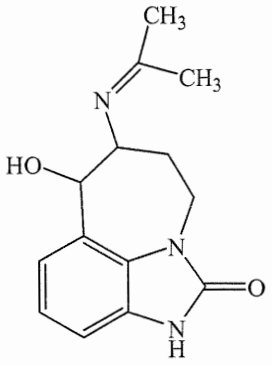
14. The process according to any one of claims 1, 2, 3, 4, 5, 10, 11, 12, and 13, wherein the inorganic nitrite comprises a nitrite salt.

15. The process according to claim 14, wherein the nitrite salt comprises $NaNO_2$.

WE CLAIM:

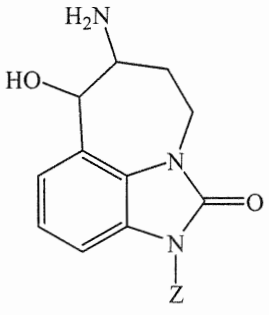
1. A process for making zilpaterol or a salt thereof, wherein the process comprises: making 4,5-dihydro-imidazo[4,5,1-jk][1]benzazepin-2,6,7[1H]-trione-6-oxime (or a salt thereof) by a process comprising reacting 8,9-dihydro-2H,7H-2,9a-diazabenzo[cd]azulene-1,6-dione (or a salt thereof) with an inorganic nitrite.

2. The process according to claim 1, wherein:
the process further comprises reacting an isopropylideneamino compound (or a salt thereof) with H_2 in the presence of a hydrogenation catalyst, and
the isopropylideneamino compound corresponds in structure to Formula (WO-1):



(WO-1).

3. The process according to claim 2, wherein:
at least a portion of the isopropylideneamino compound reacted with H_2 is made by a process comprising combining an aminoalcohol salt with acetone and acetic acid,
the aminoalcohol salt corresponds in structure to Formula (WO-2):



(WO-2), and

Z is a cation.

4. The process according to any one of claims 1, 2, and 3, wherein the inorganic nitrite comprises a nitrite salt.

5. The process according to claim, wherein the nitrite salt comprises $NaNO_2$.

5