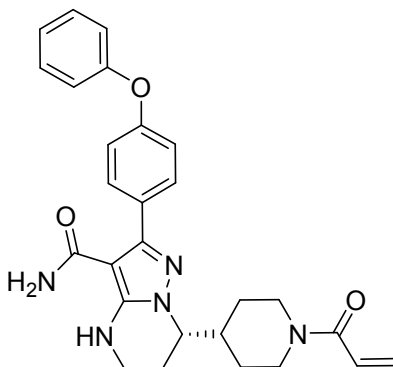


CLAIMS

1. A crystalline form of Compound 1,

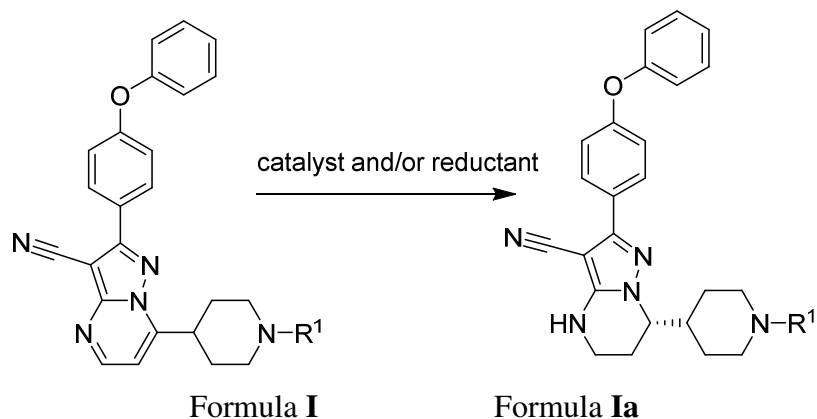


Compound 1 ,

wherein the crystalline form is an anhydrate and the crystalline form is characterized by an X-ray powder diffraction pattern comprising diffraction peaks having the following 2θ angle values: approximately $14.8\pm0.2^\circ$, $16.4\pm0.2^\circ$ and $21.4\pm0.2^\circ$.

2. The crystalline form of Claim 1, characterized by an X-ray powder diffraction pattern comprising diffraction peaks having the following 2θ angle values: approximately $14.8\pm0.2^\circ$, $15.6\pm0.2^\circ$, $16.4\pm0.2^\circ$ and $21.4\pm0.2^\circ$.
3. The crystalline form of Claim 1, characterized by an X-ray powder diffraction pattern comprising diffraction peaks having the following 2θ angle values: approximately $12.2\pm0.2^\circ$, $12.9\pm0.2^\circ$, $14.8\pm0.2^\circ$, $15.6\pm0.2^\circ$, $16.4\pm0.2^\circ$ and $21.4\pm0.2^\circ$.
4. The crystalline form of Claim 1, characterized by an X-ray powder diffraction pattern comprising diffraction peaks having the following 2θ angle values: approximately $12.2\pm0.2^\circ$, $12.9\pm0.2^\circ$, $14.8\pm0.2^\circ$, $15.6\pm0.2^\circ$, $16.4\pm0.2^\circ$, $17.7\pm0.2^\circ$, $18.5\pm0.2^\circ$, $20.7\pm0.2^\circ$ and $21.4\pm0.2^\circ$.
5. The crystalline form of Claim 1, wherein the crystalline form has an X-ray powder diffraction pattern substantially in accordance with **FIG. 1**.
6. The crystalline form of any one of Claims 1-5, wherein the crystalline form is characterized by a melting point of $139\pm2^\circ\text{C}$ (onset temperature).
7. The crystalline form of any one of Claims 1-5, wherein the crystalline form is characterized by having a DSC substantially in accordance with **FIG. 2**.
8. The crystalline form of any one of Claims 1-5, wherein the crystalline form is characterized by having a TGA substantially in accordance with **FIG. 3**.
9. The crystalline form of any one of Claims 1-5, wherein the crystalline form is characterized by a purity of $>85\%$ or a purity of $>95\%$ or a purity of $>99\%$.

10. A method of preparing the compound of Formula **Ia**, comprising asymmetrically reducing the compound of Formula **I** in the presence of the catalyst and/or reductant to produce the compound of Formula **Ia**,

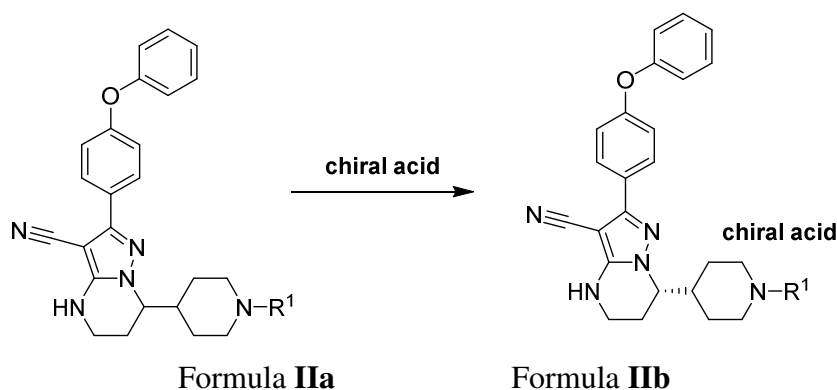


wherein the R¹ is hydrogen or an amino protecting group.

11. The method of Claim 10, where in the amino protecting group is selected from acetyl, propionyl, butyryl, phenylacetyl, benzoyl, toluyl, phenoxyacetyl, methoxycarbonyl, ethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, tert-butyloxycarbonyl, 2-iodoethoxycarbonyl, carbobenzoxy, 4-methoxybenzyloxycarbonyl, (Fluoren-9-ylmethoxy)carbonyl, 4-methoxy-2,3,6-trimethylbenzenesulphonyl, benzyl, methyl or 4-methoxybenzyl.

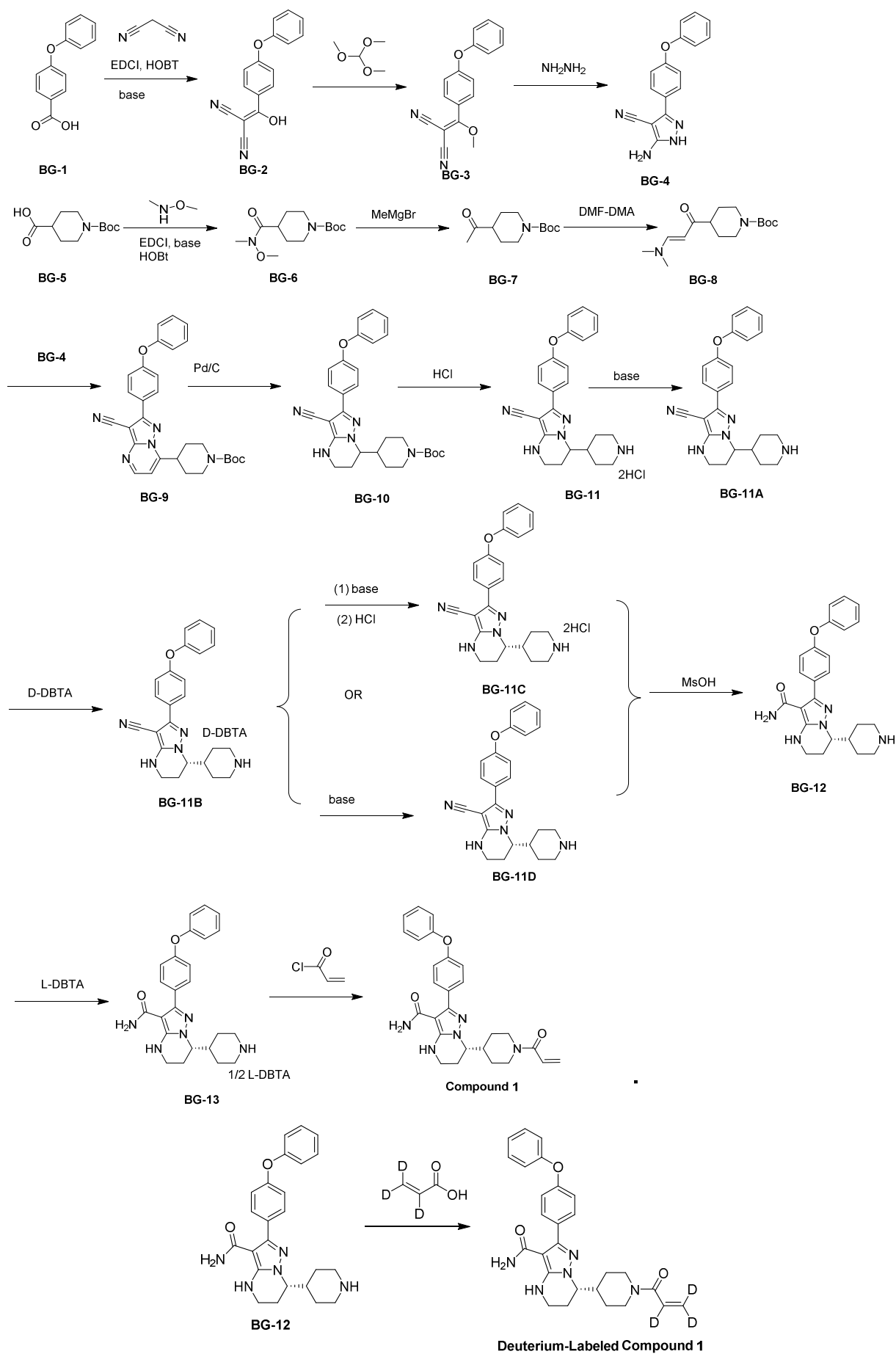
12. The method of Claim 10, wherein the catalyst is a neutral catalyst system, or a cationic catalyst system.

13. A method of resolving a compound of Formula **IIa** to produce the compound of Formula **IIb** or improving the chiral purity of the compound of Formula **IIb**, comprising treating the racemic compound of Formula **IIa** with a chiral acid,



wherein the R¹ is hydrogen, methyl, benzyl, 4-methoxybenzyl or the other conventional amino protecting groups.

14. A method of preparing Compound **1** and deuterium-labeled Compound **1**, comprising the following:



15. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving Compound 1 in DCM, swapping to solvent EA, recrystallizing from EA/MTBE, to obtain the target crystalline form.
16. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving Compound 1 in EA, adding hexane, to obtain the target crystalline form.
17. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving Compound 1 in an organic solvent, adding H₂O, to obtain the target crystalline form, wherein the organic solvent is selected from acetone or DMAc.
18. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving the crystalline of Claims 1-9 in an organic solvent, adding H₂O, to obtain the target crystalline form, wherein the organic solvent is selected from acetone or DMAc.
19. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving Compound 1 in an organic solvent, adding n-heptane, to obtain the target crystalline form, wherein the organic solvent is selected from EtOAc, DCM, toluene or 2-MeTHF.
20. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving the crystalline of Claims 1-9 in an organic solvent, adding n-heptane, to obtain the target crystalline form, wherein the organic solvent is selected from EtOAc, DCM, toluene or 2-MeTHF.
21. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving Compound 1 in acetone or EtOAc to obtain a solution, placing the solution into n-heptane, evaporating at RT, to obtain the target crystalline form.
22. A method of preparing the crystalline form of any one of Claims 1-9, comprising the steps of dissolving the crystalline of Claims 1-10 in acetone or EtOAc to obtain a solution, placing the solution into n-heptane, evaporating at RT, to obtain the target crystalline form.
23. The method of Claims 15-22, wherein Compound 1 or the crystalline of Claims 1-5 has ee value more than 90%, preferably more than 97%.
24. A pharmaceutical composition comprising a therapeutically effective amount of the crystalline form of any one of Claims 1-9, and a pharmaceutically acceptable excipient.
25. The pharmaceutical composition of Claim 24, wherein the pharmaceutical composition is used in an oral administration.
26. The pharmaceutical composition of any one of Claims 24 or 25, wherein the pharmaceutical composition contains 1 wt%-99 wt% of the crystalline form of any one of Claims 1-9.

27. The pharmaceutical composition of Claim 24 wherein the composition contains 1 wt%-70 wt% of the crystalline form of any one of Claims 1-9.
28. The pharmaceutical composition of Claim 24, wherein the composition contains 10 wt%-30 wt% of the crystalline form of any one of Claims 1-9.
29. Use of the crystalline form of any one of Claims 1-9 in the manufacture of a medicament for treating a disease selected from an allergic disease, an autoimmune disease, an inflammatory disease, a cancer.
30. Use of the crystalline form of any one of Claims 1-9 in the manufacture of a medicament for treating a B-cell proliferative disease, selected from B-cell malignancies.
31. The use of Claim 30, wherein the B-cell proliferative disease is B-cell malignancies, selected from lymphoma, non-Hodgkin's lymphoma (NHL), diffuse large B cell lymphoma (DLBCL), mantle cell lymphoma (MCL), follicular lymphoma (FL), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), waldenstrom macroglobulinemia (WM), marginal zone lymphoma (MZL), Hairy cell leukemia (HCL), Burkitt's-like leukemia (BL), or a combination of two or more thereof.
32. The use of Claim 30, wherein the B-cell proliferative disease is relapsed / refractory B-cell malignancies, selected from relapsed / refractory mantle cell lymphoma (R/R MCL), relapsed / refractory chronic lymphocytic leukemia (R/R CLL), relapsed / refractory small lymphocytic lymphoma (R/R SLL), relapsed / refractory Waldenstrom macroglobulinemia (R/R WM), or a combination of two or more thereof.
33. The use of Claim 30, wherein the crystalline form of any one of Claims 1-9 was administrated at a dose of 40 mg-320 mg/day.
34. The use of Claim 30, wherein the crystalline form of any one of Claims 1-9 was administrated at a dose of 160 mg twice a day (BID) or 320 mg once a day (QD).