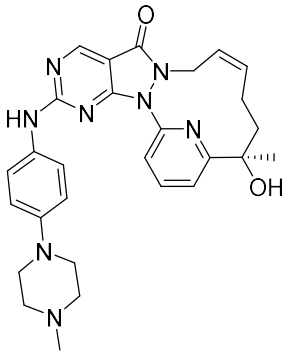
Claims

Claim 1. A Crystal Form A of a compound of formula (I), wherein the Crystal Form A has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 5.71±0.2°, 12.68±0.2°and 15.32±0.2°.



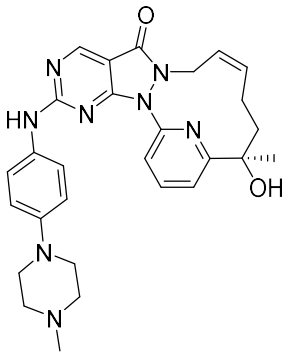
Formula (I).

Claim 2. The Crystal Form A according to claim 1, wherein the Crystal Form A has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 5.71±0.2°, 12.68±0.2°, 15.32±0.2°, 18.04±0.2°, 19.72±0.2°, 21.44±0.2°, 23.61±0.2°and 25.68±0.2°.

Claim 3. The Crystal Form A according to claim 1 or 2, wherein the Crystal Form A has a Differential Scanning Calorimetry curve (DSC) having one onset point of endothermic peak at 34.95±3°C, 174.75 ±3°C and 219.12 ±3°C, respectively.

Claim 4. The Crystal Form A according to claim 1 or 2, wherein the Crystal Form A has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 70.33±3°C is 0.7367%, and the weight loss at 209.42±3°C is 3.123%.

Claim 5. A Crystal Form B a compound of formula (I), wherein the Crystal Form B has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 5.58±0.2°, 12.44±0.2°and 22.16±0.2°.



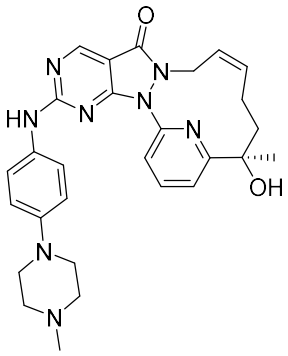
Formula (I).

Claim 6. The Crystal Form B according to claim 5, wherein the Crystal Form B has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 5.58±0.2°, 11.71±0.2°, 12.44±0.2°, 14.48±0.2°, 15.13±0.2°, 18.64±0.2°, 22.16±0.2° and 26.33±0.2°.

Claim 7. The Crystal Form B according to claim 5 or 6, wherein the Crystal Form B has a Differential Scanning Calorimetry curve (DSC) having one onset point of endothermic peak at 42.88±3°C, 198.79±3°C and 222.36 ±3°C, respectively.

Claim 8. The Crystal Form B according to claim 5 or 6, wherein the Crystal Form B has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 64.21±3°C is 3.265%; and the weight loss at 243.05±3°C is 1.516%.

Claim 9. A Crystal Form C a compound of formula (I), wherein the Crystal Form C has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 5.05±0.2°, 5.58±0.2°and 12.44±0.2°.



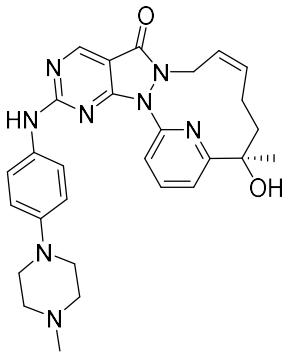
Formula (I).

Claim 10. The Crystal Form C according to claim 9, wherein the Crystal Form C has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 5.05±0.2°, 5.58±0.2°, 12.44±0.2°, 15.91±0.2°, 16.68±0.2°, 17.61±0.2°, 22.19±0.2°and 26.37±0.2°.

Claim 11. The Crystal Form C according to claim 9 or 10, wherein the Crystal Form C has a Differential Scanning Calorimetry curve (DSC) having one onset point of endothermic peak at 37.06±3°C, 189.16±3°C and 218.61±3°C, respectively.

Claim 12. The Crystal Form C according to claim 9 or 10, wherein the Crystal Form C has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 64.98±3°C is 2.211%; and the weight loss at 224.71±3°C is 1.127%.

Claim 13. A Crystal Form D of a compound of formula (I), wherein the Crystal Form D has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 5.22±0.2°, 15.99±0.2°and 16.57±0.2°.



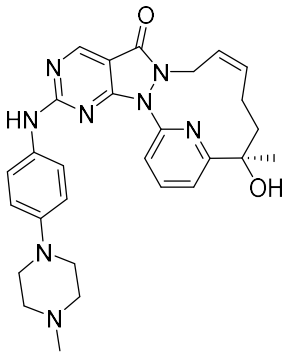
Formula (I).

Claim 14. The Crystal Form D according to claim 13, wherein the Crystal Form D has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 5.22±0.2°, 15.18±0.2°, 15.99±0.2°, 16.57±0.2°, 17.08±0.2°, 18.60±0.2°, 21.22±0.2°and 21.89±0.2°.

Claim 15. The Crystal Form D according to claim 13 or 14, wherein the Crystal Form D has a Differential Scanning Calorimetry curve (DSC) having one onset point of endothermic peak at 56.07±3°C, 193.93±3°C and 216.54±3°C, respectively.

Claim 16. The crystal Form D according to claim 13 or 14, wherein the Crystal Form D has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 79.35±3°C is 1.977%; and the weight loss at 223.66±3°C is 1.589%.

Claim 17. A Crystal Form E of a compound of formula (I), wherein the Crystal Form E has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 8.65±0.2°, 14.22±0.2°and 24.58±0.2°.



Formula (I).

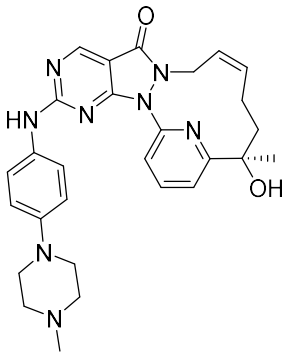
Claim 18. The Crystal Form E according to claim 17, wherein the Crystal Form E has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 8.65±0.2°, 11.41±0.2°, 13.13±0.2°, 14.22±0.2°, 17.35±0.2°, 18.34±0.2°, 20.39±0.2°, 20.94±0.2°and 24.58±0.2°.

Claim 19. The Crystal Form E according to claim 17 or 18, wherein the Crystal Form E has a Differential Scanning

Calorimetry curve (DSC) having one onset point of endothermic peak at 121.57±3°C, 197.26±3°C and 217.23±3°C, respectively; and one peak value of exothermic peak at 168.31 ±3°C and 212.95 ±3°C, respectively.

Claim 20. The Crystal Form E according to claim 17 or 18, wherein the Crystal Form E has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 143.31±3°C is 6.775%; and the weight loss at 213.62±3°C is 0.3184%.

Claim 21. A Crystal Form F of a compound of formula (I), wherein the Crystal Form F has an X-ray powder diffraction (XRPD) pattern having characteristic diffraction peaks at the following 2θ angles: 5.06±0.2°, 15.91±0.2°and 16.68±0.2°.



Formula (I).

Claim 22. The Crystal Form F according to claim 21, wherein the Crystal Form F has an X-ray powder diffraction pattern having characteristic diffraction peaks at the following 2θ angles: 5.06±0.2°, 8.34±0.2°, 10.98±0.2°, 15.13±0.2°, 15.91±0.2°, 16.68±0.2°, 17.63±0.2°and 18.87±0.2°.

Claim 23. The Crystal Form F according to claim 21 or 22, wherein the Crystal Form F has a Differential Scanning Calorimetry curve (DSC) having one onset point of endothermic peak at 48.69±3°C and 225.26±3°C, respectively.

Claim 24. The Crystal Form F according to claim 21 or 22, wherein the Crystal Form F has a Thermogravimetric Analysis curve (TGA), wherein the weight loss at 100±3°C is 3.404%.

Claim 25. Use of the Crystal Form A according to any one of claims 1-4, the Crystal Form B according to any one of claims 5-8, the Crystal Form C according to any one of claims 9-12, the Crystal Form D according to any one of claims 13-16, the Crystal Form E according to any one of claims 17-20, or the Crystal Form F according to any one of claims 21-24 for the manufacture of a medicament for treating a Wee1-related disease, wherein the Wee1-related disease comprises colon cancer or pancreatic cancer.

Claim 26. A process for preparing a Crystal Form F of a compound of formula (I) according to any one of claims 21-24, comprising,

(a) adding the compound of formula (I) into an alcohol solvent with stirring which is heated in an oil bath to 55~65°C;

(b) stirring at 47°C-53°C for 72 h;

(c) stopping heating and keeping stirring with the temperature spontaneously lowered for 1 h to 27°C;

(d) allowing standing for 18 h, filtering and rinsing the filter cake with methanol;

(e) drying under vacuum at 60°C for 48 h.

Claim 27. The preparing process according to claim 26, wherein, the alcohol solvent is methanol.

Claim 28. The Crystal Form A according to any one of claims 1-4, the Crystal Form B according to any one of claims 5-8, the Crystal Form C according to any one of claims 9-12, the Crystal Form D according to any one of claims 13-16, the Crystal Form E according to any one of claims 17-20, or the Crystal Form F according to any one of claims 21-24 for use in treating a disease.