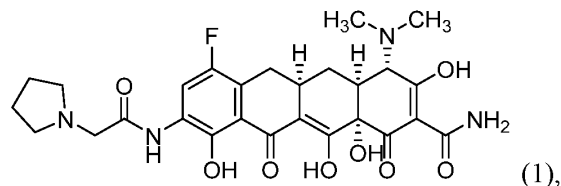


CLAIMS

What is claimed is:

1. A crystalline form of the bis-HCl salt of a compound represented by Structural Formula 1:

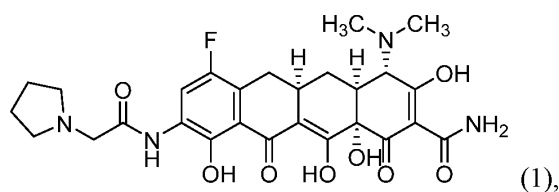


wherein

the crystalline form is Form I and is characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 7.22° , 7.80° , 10.41° , and 11.11° .

2. The crystalline form of claim 1, wherein the crystalline form is characterized by at least four x-ray powder diffraction peaks at 2θ angles selected from 7.22° , 7.80° , 8.19° , 10.41° , and 11.11° .
3. The crystalline form of claim 1, wherein the crystalline form is characterized by at least five x-ray powder diffraction peaks at 2θ angles selected from 7.22° , 7.80° , 8.19° , 10.41° , 11.11° , 15.00° , 16.47° and 20.44° .
4. The crystalline form of claim 1, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 7.22° , 7.80° , 8.19° , 10.41° , and 11.11° .
5. The crystalline form of claim 1, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles selected from 7.22° , 7.80° , 8.19° , 10.41° , 11.11° , 15.00° , 16.47° and 20.44° .
6. The crystalline form of claim 1, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 7.22° , 7.80° , 8.19° , 10.41° , 11.11° , 12.17° , 13.52° , 15.00° , 15.70° , 16.47° , 19.96° , and 20.44° .

7. The crystalline form of any of claims 1-6, wherein the crystalline form is characterized by an x-ray powder diffraction pattern substantially in accordance with that depicted in Figure 5.
8. The crystalline form of any one of claims 1-7, wherein the compound of Structural Formula 1 is in the form of a co-solvate.
9. The crystalline form of claim 8, wherein the co-solvate is a water and ethanol solvate.
10. The crystalline form of claim 8, wherein the co-solvate is a dihydrate and hemi-ethanolate co-solvate.
11. The crystalline form of any of claims 8, wherein the co-solvate is a variable co-solvate.
12. A crystalline form of the bis-HCl salt of a compound represented by Structural Formula 1:

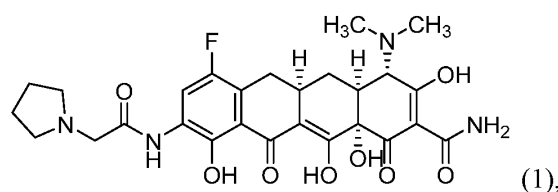


wherein

the crystalline form is Form J and is characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 7.02° , 7.80° , 22.13° , and 23.22° .

13. The crystalline form of claim 12, wherein the crystalline form is characterized by at least four x-ray powder diffraction peaks at 2θ angles selected from 7.02° , 7.80° , 10.25° , 22.13° , and 23.22° .
14. The crystalline form of claim 12, wherein the crystalline form is characterized by at least five x-ray powder diffraction peaks at 2θ angles selected from 7.02° , 7.80° , 10.25° , 11.00° , 13.29° , 13.60° , 14.98° , 21.92° , 22.13° , 23.22° , 24.02° and 25.28° .

15. The crystalline form of claim 12, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 7.02° , 7.80° , 10.25° , 22.13° , and 23.22° .
16. The crystalline form of claim 12, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 7.02° , 7.80° , 10.25° , 11.00° , 13.29° , 13.60° , 14.98° , 21.92° , 22.13° , 23.22° , 24.02° and 25.28° .
17. The crystalline form of claim 12, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 7.02° , 7.80° , 10.25° , 11.00° , 11.85° , 13.29° , 13.60° , 14.98° , 15.27° , 16.21° , 16.39° , 17.04° , 20.10° , 21.53° , 21.92° , 22.13° , 22.52° , 23.22° , 24.02° , 24.41° , 25.28° , 26.08° , 26.35° , 26.78° , and 27.90° .
18. The crystalline form of any of claims 12-17, wherein the crystalline form is characterized by an x-ray powder diffraction pattern substantially in accordance with that depicted in FIG. 7.
19. A crystalline form of the bis-HCl salt of a compound represented by Structural Formula 1:

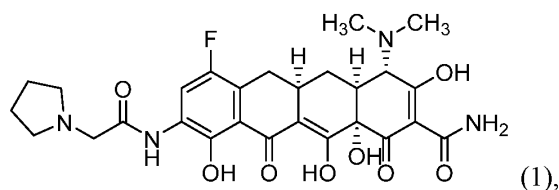


wherein

the crystalline form is Form A and is characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 3.31° , 6.01° , 6.33° , and 8.73° .

20. The crystalline form of claim 19, wherein the crystalline form is characterized by at least four x-ray powder diffraction peaks at 2θ angles selected from 3.31° , 6.01° , 6.33° , 8.73° , and 14.06° .

21. The crystalline form of claim 19, wherein the crystalline form is characterized by at least five x-ray powder diffraction peaks at 2θ angles selected from 3.31° , 6.01° , 6.33° , 8.73° , 10.49° , 14.06° and 16.55° .
22. The crystalline form of claim 19, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 3.31° , 6.01° , 6.33° , and 8.73° .
23. The crystalline form of claim 19, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 3.31° , 6.01° , 6.33° , 8.73° , 10.49° , 14.06° and 16.55° .
24. The crystalline form of any of claims 19-23, wherein the crystalline form is characterized by an x-ray powder diffraction pattern substantially in accordance with that depicted in FIG. 1.
25. The crystalline form of any one of claims 19-24, wherein the compound of Structural Formula 1 is in the form of a solvate.
26. The crystalline form of any one of claims 19-24, wherein the compound of Structural Formula 1 is in the form of a co-solvate.
27. The crystalline form of claim 26, wherein the co-solvate is a water and ethanol co-solvate.
28. A crystalline form of the bis-HCl salt of a compound represented by Structural Formula 1:

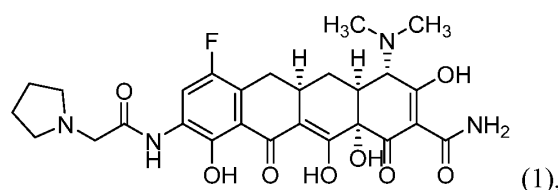


wherein

the crystalline form is Form B and is characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 9.19° , 9.66° , 23.32° , and 24.35° .

29. The crystalline form of claim 28, wherein the crystalline form is characterized by at least four x-ray powder diffraction peaks at 2θ angles selected from 9.19° , 9.66° , 17.63° , 23.32° , and 24.35° .
30. The crystalline form of claim 28, wherein the crystalline form is characterized by at least five x-ray powder diffraction peaks at 2θ angles selected from 6.10° , 9.19° , 9.48° , 9.66° , 13.05° , 17.63° , 17.77° , 19.94° , 20.48° , 23.32° and 24.35° .
31. The crystalline form of claim 28, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 9.19° , 9.66° , 23.32° , and 24.35° .
32. The crystalline form of claim 28, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 9.19° , 9.66° , 17.63° , 23.32° , and 24.35° .
33. The crystalline form of claim 28, wherein the crystalline form is characterized by at least five x-ray powder diffraction peaks at 2θ angles selected from 6.10° , 9.19° , 9.48° , 9.66° , 13.05° , 17.63° , 17.77° , 19.94° , 20.48° , 23.32° , 23.87° and 24.35° .
34. The crystalline form of claim 28, wherein the crystalline form is characterized by x-ray powder diffraction peaks at 2θ angles of 6.10° , 9.19° , 9.48° , 9.66° , 12.08° , 13.05° , 17.63° , 17.77° , 19.54° , 19.94° , 20.48° , 23.32° , 23.87° , and 24.35° .
35. The crystalline form of any of claims 28-34, wherein the crystalline form is characterized by an x-ray powder diffraction pattern substantially in accordance with that depicted in any of FIG. 3.
36. The crystalline form of any one of claims 28-35, wherein the compound of Structural Formula 1 is in the form of a solvate.

37. The crystalline form of any one of claims 28-35, wherein the compound of Structural Formula 1 is in the form of a co-solvate.
38. The crystalline form of claim 37, wherein the solvate is a water and methanol co-solvate.
39. A composition, comprising particles of one or more crystalline forms of a compound represented by the bis HCl salt of Structural Formula 1:



wherein the one or more crystalline forms are selected from:

the particles are of crystalline Form I characterized by at least three x-ray powder diffraction peaks at 2 θ angles selected from 7.22°, 7.80°, 10.41°, and 11.11°;

the particles are of crystalline form Form J characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 7.02° , 7.80° , 22.13° , and 23.22° ;

the particles are of crystalline Form A characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 3.31° , 6.01° , 6.33° , and 8.73° ; and

the particles are of crystalline Form B characterized by at least three x-ray powder diffraction peaks at 2θ angles selected from 9.19°, 9.66°, 23.32°, and 24.35°.

40. The composition of claim 39, wherein the composition comprises particles of crystalline Form I and crystalline form J.
41. The composition of claim 40, wherein the weight percent of crystalline Form J in the composition is 25% or less.

42. A pharmaceutical composition, comprising the crystalline form of any one of claims 1-38 or the composition of any one of claims 39-41 and a pharmaceutically acceptable carrier.
43. A method for treating or preventing a tetracycline-responsive disease or disorder, the method comprising administering to a subject in need thereof a therapeutically or prophylactically effective amount of the crystalline form of any one of claims 1-38, the composition of any one of claims 39-41 or the pharmaceutical composition of claim 41.
44. The method of claim 43, wherein the tetracycline-responsive disease or disorder is an infection.
45. The method of claim 44, wherein the infection is caused by bacteria.
46. The method of claim 45, wherein the infection is caused by a Gram-positive bacterium.
47. The method of claim 45, wherein the infection is caused by a Gram-negative bacterium.
48. The method of claim 44, wherein the infection is a urinary tract infection.
49. The method of claim 44, wherein the infection is an intra-abdominal infection.
50. The method of claim 43, wherein the tetracycline-responsive disease or disorder is oral mucositis.
51. The method of claim 50, wherein the patient is suffering from head and neck cancer.
52. The method of claim 51, wherein the head and neck cancer is selected from: laryngeal; hypopharyngeal; nasal cavity; paranasal sinus; nasopharyngeal; oral; oropharyngeal; and salivary gland.