**CLAIMS**

1. Crystalline minocycline base form IV characterized by an X-ray powder diffraction pattern having peaks at 8.3; 13.46; 14.1, 21.3; 16.62 ± 0.2° 2θ.

2. Crystalline minocycline base form IV according to claim 1 further characterized by an X-ray powder diffraction pattern having peaks at 7.06, 8.3, 10.3, 11.18, 13.46, 14.1, 14.94, 16.62, 20.62, 21.3, ± 0.2° 2θ.

3. Crystalline minocycline base form IV according to claim 1 or 2 characterized by an X-ray powder diffraction pattern having peaks as given in Fig. 1.

4. Crystalline minocycline base form IV according to claim 1, 2 or 3, showing an endotherm at about 146ºC from the STDA signal of a TGA analysis.

5. An acid addition salt formed from crystalline minocycline base form IV according to any preceding claim.

6. A process for preparing minocycline base form IV according to any one of claims 1 to 4 characterized by comprising dissolving minocycline base in an aliphatic ketone having 6 carbon atoms or less followed by the precipitation of, and optionally isolation of, form IV.

7. A process according to claim 5 wherein the aliphatic ketone is 3 methyl ethyl ketone (MEK).

8. A process for preparing minocycline base form IV according to claim 6 or 7 characterized by a dissolution/precipitation temperature of from 20 to 25ºC.

9. A process according to claim 6, 7 or 8 characterized in that the solution is stirred for at least 30 mins.

10. Crystalline minocycline base form V characterized by an X-ray powder diffraction pattern having peaks at 2.9, 5.34, 7.9, 12.94, 15.06, 16.74,18.22, 19.78, 21.06, 22.26, 23.02, 25.42 ± 0.2° 2θ.

11. Crystalline minocycline base form V according to claim 10 characterized by an X-ray powder diffraction pattern having peaks as given in Fig. 4.

12. Crystalline minocycline base form V according to claim 10 or 11, showing an endotherm at about 140ºC from the STDA signal of a TGA analysis.

13. An acid addition salt of formed from crystalline minocycline base form V according to any one of claims 10 to 12.

14. A process for preparing minocycline base form V according to any one of claims 10 to 12, characterized by suspending minocycline base in 2 –methyl tetrahydrofuran (THF) and applying a thermocycling temperature profile for crystallization.

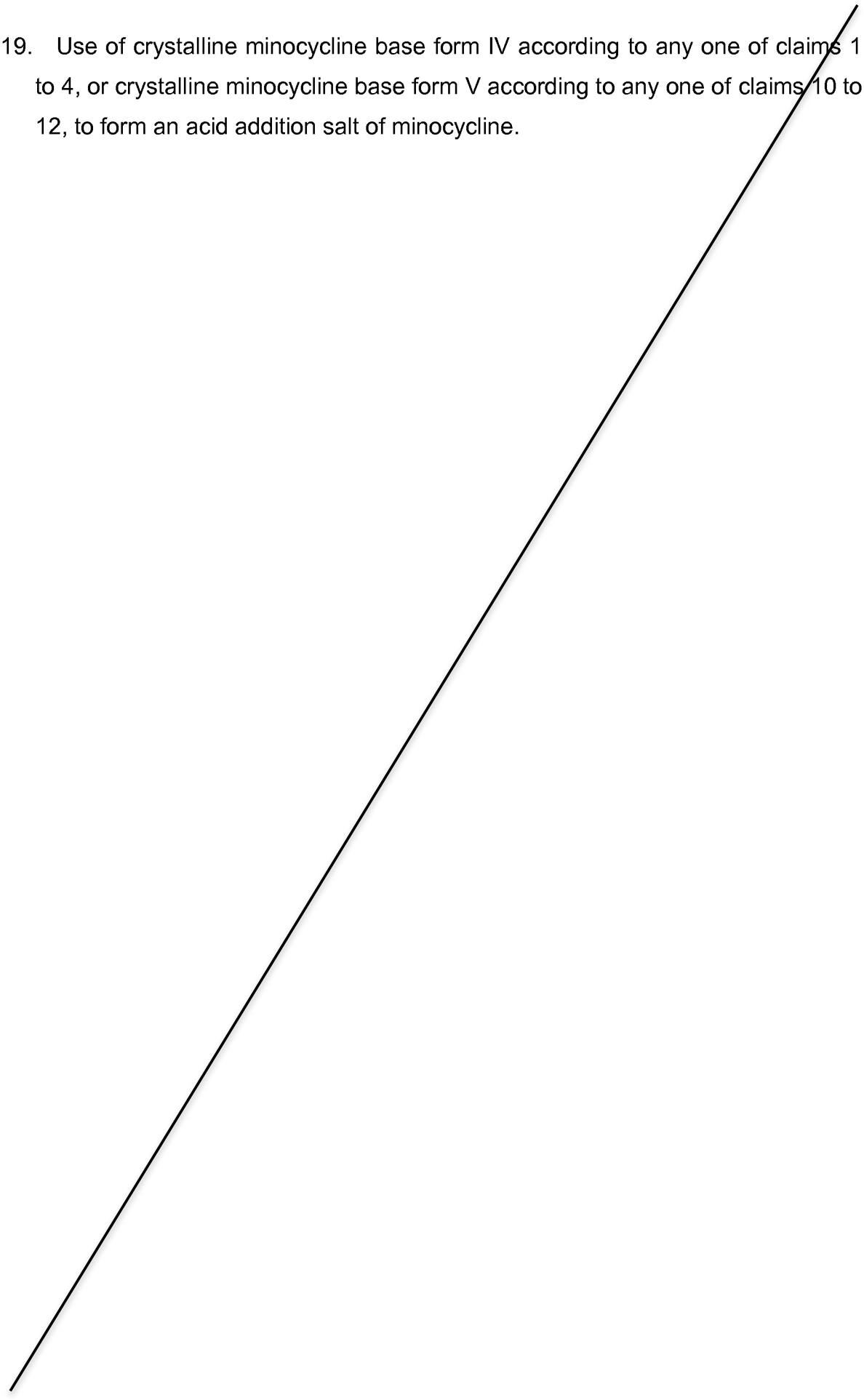
15. A process for preparing minocycline base form V according to claim 14 characterized by the thermocycling temperature profile comprising heating the suspension three times up to a temperature of about 40ºC (+/- 5 ºC) and cooling each time to about 5 ºC (+/- 5 ºC ).

16. A pharmaceutical composition characterized by comprising crystalline minocycline base form IV, or an acid addition salt thereof, according to any one of claims 1 to 5, or comprising crystalline minocycline base form V, or an acid addition salt thereof, according to any one of claims 10 to 13, and optionally one or more pharmaceutically acceptable excipients.

17. A pharmaceutical composition according to claim 16 for use in medicine.

18. A pharmaceutical composition according to claim 16 or 17 for use as an antibacterial agent or as an anti-inflammatory agent.

19. Use of crystalline minocycline base form IV according to any one of claims 1 to 4, or crystalline minocycline base form V according to any one of claims 10 to 12, to form an acid addition salt of minocycline.



## CLAIMS

1. Crystalline minocycline base form IV characterized by an X-ray powder diffraction pattern having peaks at 8.3; 13.46; 14.1, 21.3; 16.62 ± 0.2° 2θ.

2. Crystalline minocycline base form IV according to Claim 1 further characterized by an X-ray powder diffraction pattern having peaks at 7.06, 8.3, 10.3, 11.18, 13.46, 14.1, 14.94, 16.62, 20.62, 21.3, ± 0.2° 2θ.

3. Crystalline minocycline base form IV according to Claim 1 or 2 characterized by an X-ray powder diffraction pattern having peaks as given in Fig. 1.

4. Crystalline minocycline base form IV according to Claim 1, 2 or 3, showing an endotherm at about 146ºC from the STDA signal of a TGA analysis.

5. An acid addition salt formed from crystalline minocycline base form IV according to any preceding claim.

6. A process for preparing minocycline base form IV according to any of Claims 1 to 4 characterized by comprising dissolving minocycline base in an aliphatic ketone having 6 carbon atoms or less followed by the precipitation of, and optionally isolation of, form IV.

7. A process according to Claim 5 in which the aliphatic ketone is 3 methyl ethyl ketone (MEK).

8. A process for preparing minocycline base form IV according to Claim 6 or 7 characterized by a dissolution/precipitation temperature of from 20 to 25ºC.

9. A process according to Claim 6, 7 or 8 characterized in that the solution is stirred for at least 30 mins.

10. A pharmaceutical composition characterized by comprising crystalline minocycline base form IV, or an acid addition salt thereof, according to any of Claims 1 to 5 and optionally one or more pharmaceutically acceptable excipients.

11. A pharmaceutical composition according to Claim 10 for use in medicine.

12. A pharmaceutical composition according to Claim 10 or 11 for use as an antibacterial agent or as an anti-inflammatory agent.

13. Use of crystalline minocycline base form IV according to any of Claims 1 to 4 to form an acid addition salt of minocycline.