What is claimed is:

1. Polymorphic Form η, Form ι, or Form mesylate of rifaximin.

2. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.3, and 7.5 degrees 2-θ.

3. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.3, and 7.9 degrees 2-θ.

4. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.3, and 8.8 degrees 2-θ.

5. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.3, and 12.7 degrees 2-θ.

6. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.5, and 8.8 degrees 2-θ.

7. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.5, and 7.9 degrees 2-θ.

8. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, and 7.3 degrees 2-θ.

9. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, and 7.9 degrees 2-θ.

10. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, and 12.7 degrees 2-θ.

11. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, and 7.5 degrees 2-θ.

12. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, and 8.8 degrees 2-θ.

13. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.1, 7.3, 7.5, 7.9, 8.8, and 12.7 degrees 2-θ.

14. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, 7.3, 7.5, 7.9, 8.8, 12.7 degrees 2-θ.

15. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, 7.3, 7.9, 8.8, and 12.7 degrees 2-θ.

16. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, 7.3, 7.5, 8.8, and 12.7 degrees 2-θ.

17. The polymorph Form η of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.3, 6.1, 7.3, 7.5, 7.9, 8.8, and 12.7 degrees 2-θ.

18. The polymorph Form ι of claim 1, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; or 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; or 5.9 ± 0.1; 7.9 ± 0.1; 12.7 ± 0.1; or 5.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1; or 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; or 5.9 ± 0.1; 7.9 ± 0.1; 14.9 ± 0.1; or 9.0 ± 0.1; 12.7 ± 0.1; 14.9 ± 0.1; or 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 14.9 ± 0.1; or 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1; or 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1.

19. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 9.4 ± 0.1.

20. The polymorph Form ι of claim 1, wherein polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 7.4 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1.

21. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1.

22. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1.

23. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1.

24. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 7.4 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 23.4 ± 0.1.

25. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1.

26. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 9.4 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ±0.1; 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1

27. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1; or 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; or 7.4 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 23.4 ± 0.1; or 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1; or 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1; or 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 9.4 ± 0.1; or 7.4 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1; or 5.9 ± 0.1; 7.4 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 9.4 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1; 20.0 ± 0.1; 20.9 ± 0.1; 23.4 ± 0.1.

28. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1.

29. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1.

30. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 12.7 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1.

31. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 12.7 ± 0.1.

32. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1.

33. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 13.9 ± 0.1; 14.9 ± 0.1.

34. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 14.9 ± 0.1.

35. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 9.0 ± 0.1; 12.7 ± 0.1; 14.9 ± 0.1.

36. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 14.9 ± 0.1.

37. The polymorph Form ι of claim 1, wherein the polymorph Form ι exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.9 ± 0.1; 7.9 ± 0.1; 9.0 ± 0.1; 12.7 ± 0.1.

38. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 8.46 ± 0.10; 10.95 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 8.46 ± 0.10; or 5.34 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; or 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; or 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10; or 16.23 ± 0.10; 17.70 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10; or 5.34 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10.

39. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; or 5.34 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; or 5.34 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; or 6.93 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; or 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; or 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 17.94 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; or 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; 22.77 ± 0.10; 24.81 ± 0.10; 27.81 ± 0.10.

40. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10.

41. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10.

42. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10.

43. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.93 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10.

44. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; .29 ± 0.10.

45. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10.

46. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 17.94 ± 0.10.

47. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10.

48. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10.

49. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; .29 ± 0.10; 22.77 ± 0.10; 24.81 ± 0.10; 27.81 ± 0.10.

50. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 8.46 ± 0.10; 10.95 ± 0.10.

51. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 8.46 ± 0.10.

52. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10.

53. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10.

54. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10.

55. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 16.23 ± 0.10; 17.70 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10.

56. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10.

57. The mesylate Form of claim 1, wherein the mesylate Form of rifaximin exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at 5.34 ± 0.10; 6.93 ± 0.10; 7.41 ± 0.10; 8.46 ± 0.10; 10.62 ± 0.10; 10.95 ± 0.10; 16.23 ± 0.10; 17.70 ± 0.10; 17.94 ± 0.10; 19.29 ± 0.10; 22.77 ± 0.10.

58. The Form η or Form ι of rifaximin of claim 1, wherein the polymorph contains less than 5% by weight total impurities.

59. The Form η, Form ι, or Form mesylate of rifaximin of claim 1, wherein the form is at least 50% pure, or at least 75% pure, or at least 80% pure, or at least 90% pure, or at least 95% pure, or at least 98% pure.

60. A pharmaceutical composition comprising one or more of a Form η, Form ι, or Form mesylate forms of rifaximin and a pharmaceutically acceptable carrier.

61. The pharmaceutical composition of claim 60, further comprising one or more pharmaceutically acceptable excipients.

62. The pharmaceutical composition of claim 61, wherein the excipient comprises one or more of a diluting agent, binding agent, lubricating agent, disintegrating agent, coloring agent, flavoring agent or sweetening agent.

63. The pharmaceutical composition of claim 60, formulated as coated or uncoated tablets, hard or soft gelatin capsules, sugar-coated pills, lozenges, wafer sheets, pellets or powders in sealed packets.

64. The pharmaceutical composition of claim 60, formulated for topical use.

65. An effective amount of one or more of Form η, Form ι, or mesylate Form of rifaximin for use in treating, preventing or alleviating a bowel related disorder in a subject in need thereof.

66. The use according to claim 65, wherein the subject is suffering from at least one bowel related disorder selected from the group consisting of irritable bowel syndrome, travelers' diarrhea, small intestinal bacterial overgrowth, Crohn's disease, chronic pancreatitis, pancreatic insufficiency, enteritis and colitis.

67. A process for producing Form η of rifaximin comprising drying Form ζ of rifaximin.

68. A process of producing a mesylate Form of rifaximin comprising the conditions set forth in Table 26.

69. A process for producing Form ι of rifaximin comprising performing the conditions set forth in Table 27.

70. A process for producing Form η of rifaximin comprising precipitating the initial forms in the manner set forth in Table 17.

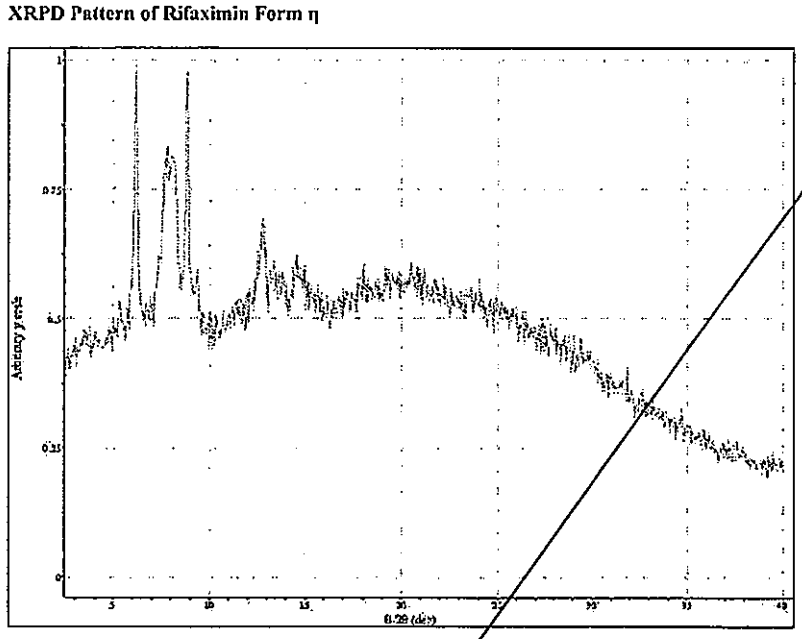
71. A process for producing Form η of rifaximin comprising precipitating the initial forms of rifaximin in the manner set forth in Tables 20 – 22.

72. A kit for treating a bowel disorder in a subject, comprising Form η of rifaximin and instructions for use.

73. A packaged composition comprising, a therapeutically effective amount of one or more of a Form η, or Form ι of rifaximin and a pharmaceutically acceptable carrier or diluent, wherein the composition is formulated for treating a subject suffering from or susceptible to a bowel disorder, and packaged with instructions to treat a subject suffering from or susceptible to a bowel disorder.

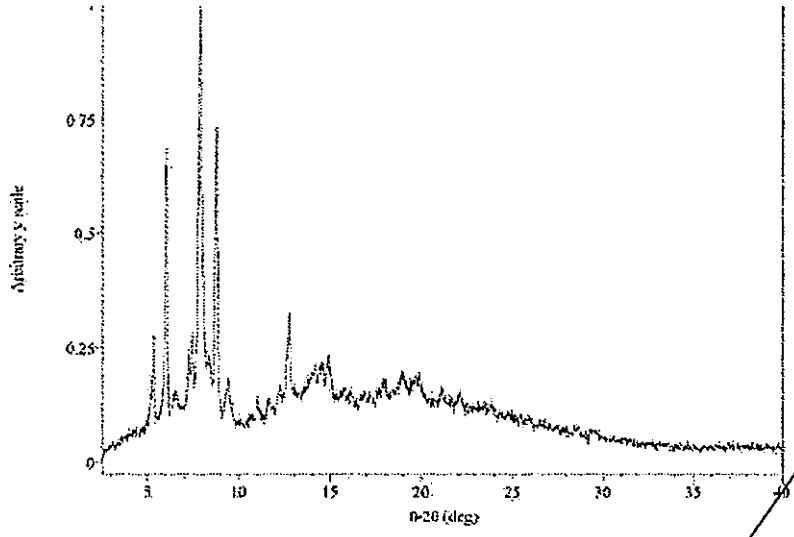
74. A mesylate form of rifaximin.

75. The Form η of rifaximin of claim 1, comprising an XRPD pattern substantially similar to Figure 3 as shown below:-



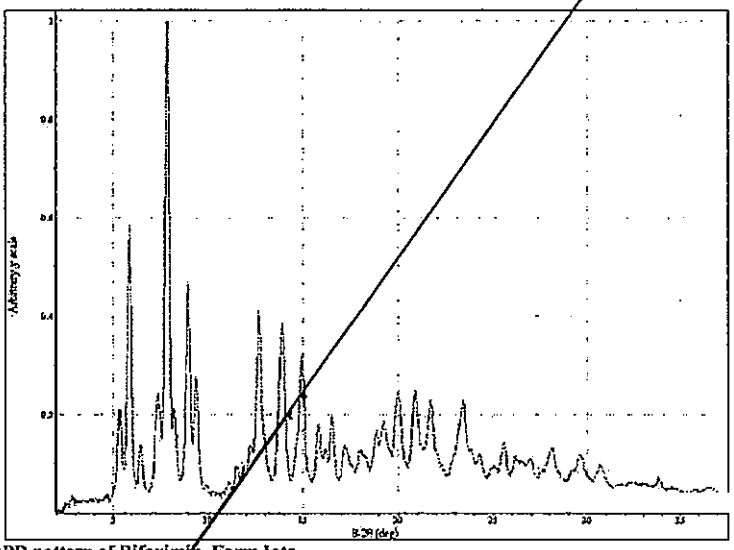

(Figure 3).

76. The Form η of rifaximin of claim 1, comprising an XRPD pattern substantially similar to Figure 9 as shown below:-




(Figure 9).

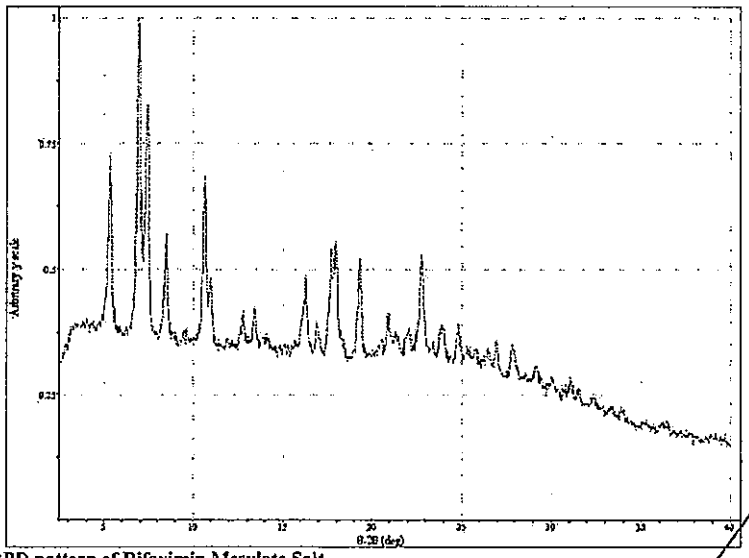
77. The Form ι of rifaximin of claim 1, comprising an XRPD pattern substantially similar to Figure 11 as shown below:-



XRPD pattern of Rifaximin, Form Iota.

(Figure 11).

78. The mesylate Form of rifaximin of claim 1 comprising an XRPD pattern substantially similar to Figure 15 as shown below:-

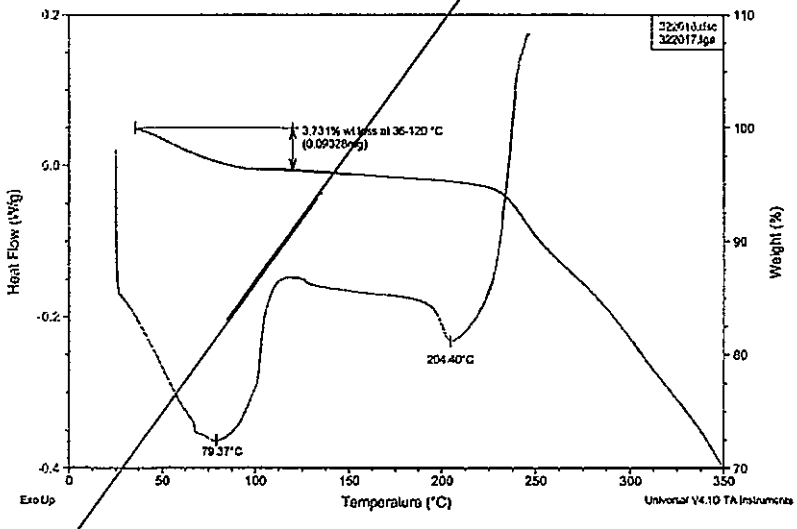


XRPD pattern of Rifaximin Mesylate Salt.

(Figure 15).

79. The Form ι of claim 1, comprising thermal data substantially similar to Figure 31 as shown below:-

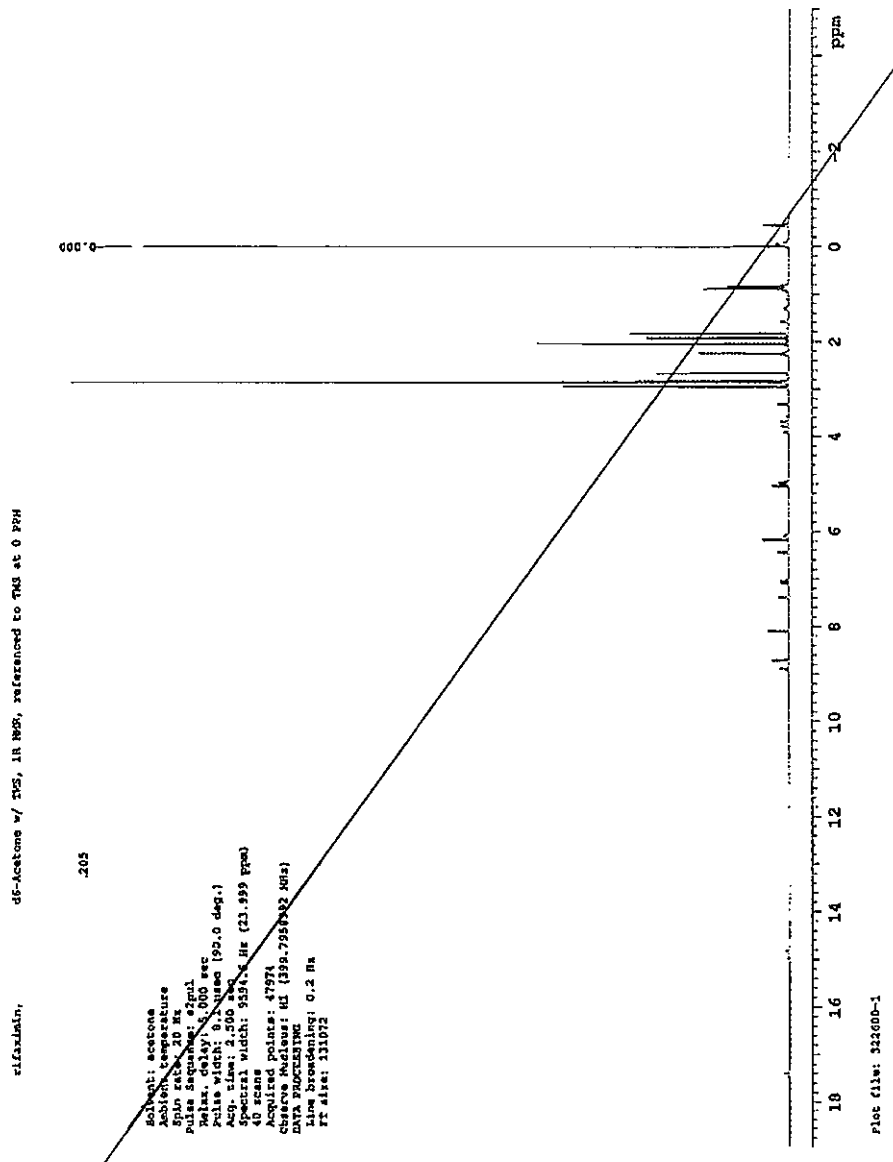
Thermal data for Rifaximin, Form ι




(Figure 31).

80. The Form ι of claim 1, comprising proton NMR spectrum substantially similar to Figure 34 as shown below:-

**Proton NMR spectrum of Rifaximin, Form ι**




(Figure 34).

## Claims

1. A rifaximin polymorph Form η, wherein the polymorph exhibits an X-ray powder diffraction pattern having characteristic peaks expressed in degrees 2θ (+/- 0.20 degree θ) at

5.3, 6.1 and 7.9; or

5.3, 6.1 and 12.7; or

5.3, 6.1 and 8.8.

2. A pharmaceutical composition comprising the polymorph Form η of rifaximin of claim 1; and one or more pharmaceutically acceptable excipients.

3. The pharmaceutical composition of claim 2, wherein the excipient comprises one or more of a diluting agent, binding agent, lubricating agent, disintegrating agent, coloring agent, flavoring agent or sweetening agent.

4. The pharmaceutical composition of claim 2, formulated as coated or uncoated tablets, hard gelatin capsules, sugar-coated pills, lozenges, wafer sheets, pellets or powders in sealed packets.

5. A process for producing Form η of rifaximin comprising drying Form ζ of rifaximin.

6. A packaged composition comprising a therapeutically effective amount of the polymorph Form η of rifaximin of claim 1; and a pharmaceutically acceptable carrier or diluent, wherein the composition is formulated for treating a subject suffering from or susceptible to a bowel disorder, and packaged with instructions to treat a subject suffering from or susceptible to a bowel disorder.

7. The Form η of rifaximin of claim 1, wherein the polymorph contains less than 5% by weight total impurities.

8. The Form η of rifaximin of claim 1, wherein the form is at least 50% pure, or at least 75% pure, or at least 80% pure, or at least 90% pure, or at least 95% pure, or at least 98% pure.