WHAT IS CLAIMED IS:

1. Tenofovir alafenamide hemifumarate.

2. Tenofovir alafenamide hemifumarate, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.1.

3. The hemifumarate of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.05.

4. The hemifumarate of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.01.

5. The hemifumarate of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is about 0.5.

6. The hemifumarate of any one of claims 1-5 that is a solid.

7. Tenofovir alafenamide hemifumarate, wherein an X-ray powder diffraction (XRPD) pattern comprises 2theta values of 6.9 ± 0.2° and 8.6 ± 0.2°.

8. The hemifumarate of claim 7, wherein the XRPD pattern comprises 2theta values of 6.9 ± 0.2°, 8.6 ± 0.2°, 11.0 ± 0.2°, 15.9 ± 0.2°, and 20.2 ± 0.2°.

9. The hemifumarate of claim 1 that has a differential scanning calorimetry (DSC) onset endotherm of 131 ± 2 °C.

10. The hemifumarate of claim 9 that has a DSC onset endotherm of 131 ± 1 °C.

11. A pharmaceutical composition comprising the hemifumarate of any one of claims 1-10 and a pharmaceutically acceptable excipient.

12. The pharmaceutical composition of claim 11, further comprising an additional therapeutic agent.

13. The pharmaceutical composition of claim 12, wherein the additional therapeutic agent is selected from the group consisting of human immunodeficiency virus (HIV) protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

14. A method for treating a human immunodeficiency virus (HIV) infection comprising administering to a subject in need thereof a therapeutically effective amount of the hemifumarate of any one of claims 1-10.

15. A method for treating an HIV infection comprising administering to a subject in need thereof a therapeutically effective amount of the pharmaceutical composition of claim 11.

16. The method for treating an HIV infection of claim 14 or 15, further comprising administering to the subject one or more additional therapeutic agents selected from the group consisting of HIV protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

17. A method for treating a hepatitis B virus (HBV) infection comprising administering to a subject in need thereof a therapeutically effective amount of the hemifumarate of any one of claims 1-10.

18. A method for treating an HBV infection comprising administering to a subject in need thereof a therapeutically effective amount of the pharmaceutical composition of claim 11.

19 A method for preparing a pharmaceutical composition comprising combining the hemifumarate of any one of claims 1-10 and a pharmaceutically acceptable excipient to provide the pharmaceutical composition.

20. A method for preparing tenofovir alafenamide hemifumarate comprising subjecting a solution comprising: a) a suitable solvent; b) fumaric acid; c) tenofovir alafenamide; and d) one or more seeds of tenofovir alafenamide hemifumarate, to conditions that provide for the crystallization of the fumaric acid and the tenofovir alafenamide.

21. The method of claim 20, wherein the solvent comprises acetonitrile.

22. The method of claim 20, wherein the solution is subjected to a temperature in the range of from about 0 °C to about 75 °C.

23. The hemifumarate of any one of claims 1-10 for use in medical therapy.

24. Use of the hemifumarate of any one of claims 1-10 for the prophylactic or therapeutic treatment of an HIV infection.

25. Use of the hemifumarate of any one of claims 1-10 to treat an HIV infection.

26. Use of the hemifumarate of any one of claims 1-10 for the preparation or manufacture of a medicament for the treatment of an HIV infection.

27. The hemifumarate of any one of claims 1-10 for use in treating an HIV infection.

28. Use of the hemifumarate of any one of claims 1-10 for the prophylactic or therapeutic treatment of an HBV infection.

29. Use of the hemifumarate of any one of claims 1-10 to treat an HBV infection.

30. Use of the hemifumarate of any one of claims 1-10 for the preparation or manufacture of a medicament for the treatment of an HBV infection in a human.

31. The hemifumarate of any one of claims 1-10 for use in treating an HBV infection.

32. The method for treating an HIV infection of claim 14, wherein the hemifumarate is administered in multiple daily doses.

33. The method for treating an HIV infection of claim 14, wherein the hemifumarate is administered in a single daily dose.

34. The method for treating an HBV infection of claim 17, wherein the hemifumarate is administered in multiple daily doses.

35. The method for treating an HBV infection of claim 17, wherein the hemifumarate is administered in a single daily dose.

36. A composition consisting essentially of tenofovir alafenamide hemifumarate.

37. A composition consisting essentially of tenofovir alafenamide hemifumarate, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.1.

38. The composition of claim 37, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.05.

39. The composition of claim 37, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.01.

40. The composition of claim 37, wherein the ratio of fumaric acid to tenofovir alafenamide is about 0.5.

41. The composition of any one of claims 36-40 that is a solid.

42. A composition consisting essentially of tenofovir alafenamide hemifumarate, wherein an XRPD pattern comprises 2theta values of 6.9 ± 0.2° and 8.6 ± 0.2°.

43. The composition of claim 42, wherein the XRPD pattern comprises 2theta values of 6.9 ± 0.2°, 8.6 ± 0.2°, 11.0 ± 0.2°, 15.9 ± 0.2°, and 20.2 ± 0.2°.

44. The composition of claim 36 that has a DSC onset endotherm of 131 ± 2 °C.

45. The composition of claim 44 that has a DSC onset endotherm of 131 ± 1 °C.

46. A pharmaceutical composition comprising the composition of any one of claims 36-45 and a pharmaceutically acceptable excipient.

47. The pharmaceutical composition of claim 46, further comprising an additional therapeutic agent.

48. The pharmaceutical composition of claim 47, wherein the additional therapeutic agent is selected from the group consisting of HIV protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

49. A method for treating an HIV infection comprising administering to a subject in need thereof a therapeutically effective amount of the composition of any one of claims 36-45.

50. A method for treating an HIV infection comprising administering to a subject in need thereof a therapeutically effective amount of the pharmaceutical composition of claim 46.

51. The method for treating an HIV infection of claim 49 or 50, further comprising administering to the subject one or more additional therapeutic agents selected from the group consisting of HIV protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

52. A method for treating an HBV infection comprising administering to a subject in need thereof a therapeutically effective amount of the composition of any one of claims 36-45.

53. A method for treating an HBV infection comprising administering to a subject in need thereof a therapeutically effective amount of the pharmaceutical composition of claim 46.

54. A method for preparing a pharmaceutical composition comprising combining the composition of any one of claims 36-45 and a pharmaceutically acceptable excipient to provide the pharmaceutical composition.

55. The composition of any one of claims 36-45 for use in medical therapy.

56. Use of the composition of any one of claims 36-45 for the prophylactic or therapeutic treatment of an HIV infection.

57. Use of the composition of any one of claims 36-45 to treat an HIV infection.

58. Use of the composition of any one of claims 36-45 for the preparation or manufacture of a medicament for the treatment of an HIV infection.

59. The composition of any one of claims 36-45 for use in treating an HIV infection.

60. Use of the composition of any one of claims 36-45 for the prophylactic or therapeutic treatment of an HBV infection.

61. Use of the composition of any one of claims 36-45 to treat an HBV infection.

62. Use of the composition of any one of claims 36-45 for the preparation or manufacture of a medicament for the treatment of an HBV infection in a human.

63. The composition of any one of claims 36-45 for use in treating an HBV infection.

64. The method for treating an HIV infection of claim 49, wherein the hemifumarate is administered in multiple daily doses.

65. The method for treating an HIV infection of claim 49, wherein the hemifumarate is administered in a single daily dose.

66. The method for treating an HBV infection of claim 52, wherein the hemifumarate is administered in multiple daily doses.

67. The method for treating an HBV infection of claim 52, wherein the hemifumarate is administered in a single daily dose.

WHAT IS CLAIMED IS:

1. Tenofovir alafenamide hemifumarate

2. A composition comprising tenofovir alafenamide hemifumarate of claim 1, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.1.

3. The composition of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.05.

4. The composition of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5 ± 0.01.

5. The composition of claim 2, wherein the ratio of fumaric acid to tenofovir alafenamide is 0.5.

6. The composition of claim 2 that is a solid.

7. Tenofovir alafenamide hemifumarate, wherein an X-ray powder diffraction (XRPD) pattern comprises 2theta values of 6.9±0.2° and 8.6±0.2°.

8. The hemifumarate of claim 7, wherein the XRPD pattern comprises 2theta values of 6.9±0.2°, 8.6±0.2°, 11.0±0.2°, 15.9±0.2°, and 20.2±0.2°.

9. The hemifumarate of claim 1 that has a differential scanning calorimetry (DSC) onset endotherm of 131±2° C.

10. The hemifumarate of claim 9 that has a DSC onset endotherm of 131±1° C.

11. A pharmaceutical composition comprising the hemifumarate of claim 1 and a pharmaceutically acceptable excipient.

12. The pharmaceutical composition of claim 11, further comprising an additional therapeutic agent.

13. The pharmaceutical composition of claim 12, wherein the additional therapeutic agent is selected from the group consisting of human immunodeficiency virus (HIV) protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

14. A composition for treating a human immunodeficiency virus (HIV) infection administered to a subject in need thereof, comprising a therapeutically effective amount of the hemifumarate of claim 1.

15. The composition for treating an HIV infection of claim 11 administered to a subject in need thereof at a therapeutically effective amount.

16. The composition for treating an HIV infection of claim 14, wherein the subject is further administered with one or more additional therapeutic agents selected from the group consisting of HIV protease inhibiting compounds, HIV nonnucleoside inhibitors of reverse transcriptase, HIV nucleoside inhibitors of reverse transcriptase, HIV nucleotide inhibitors of reverse transcriptase, HIV integrase inhibitors, and CCR5 inhibitors.

17. The composition for treating a hepatitis B virus (HBV) infection administered to a subject in need thereof, comprising a therapeutically effective amount of the hemifumarate of claim 1.

18. The composition for treating an HBV infection of claim 11 administered to a subject in need thereof at a therapeutically effective amount.

19. A method for preparing a pharmaceutical composition comprising combining the hemifumarate of claim 1 and a pharmaceutically acceptable excipient to provide the pharmaceutical composition.

20. A method for preparing tenofovir alafenamide hemifumarate comprising combining a) an aprotic organic solvent, b) fumaric acid, c) tenofovir alafenamide, and d) one or more seeds of tenofovir alafenamide hemifumarate, and additional crystallizing of the tenofovir alafenamide.

21. The method of claim 20, wherein the solvent comprises acetonitrile.

22. The method of claim 20, wherein the solution is subjected to a temperature in the range of from 0°C to 75°C.

23. The composition for treating an HIV infection of claim 14 administered in multiple daily doses.

24. The composition for treating an HIV infection of claim 14 administered in a single daily dose.

25. The composition for treating an HBV infection of claim 17 administered in multiple daily doses.

26. The composition for treating an HBV infection of claim 17 administered in a single daily dose.

27. The composition of claim 3 that is a solid.

28. The composition of claim 4 that is a solid.

29. The composition of claim 5 that is a solid.

30. A method for preparing tenofovir alafenamide hemifumarate comprising combining a) a solvent comprising water, isopropyl alcohol, acetone, acetonitrile, toluene, ethyl acetate, isopropyl acetate, heptane, tetrahydrofuran, 2-methyl tetrahydrofuran, methyl ethyl ketone, or methyl isobutyl ketone, or a mixture thereof, b) fumaric acid, c) tenofovir alafenamide, and d) one or more seeds of tenofovir alafenamide hemifumarate, and additional crystallizing of the tenofovir alafenamide at a temperature in the range of from 0°C to 70°C.

31. The method of claim 30, wherein the solvent comprises a mixture of acetonitrile and up to about 50% methylene chloride (by volume).