CLAIMS

~~1. A process for effecting separation of at least a gaseous permeate-disposed operative material from a gaseous supply material that is being supplied to a gaseous supply material receiving space that is disposed in mass transfer communication with a permeate receiving space through a membrane, the gaseous supply material including an operative material that defines a gaseous supply material-disposed operative material, and the membrane including a gel, comprising:~~

~~supplying the gaseous supply material to the gaseous supply material receiving space, and while the supplying of the gaseous supply material to the gaseous supply material receiving space is being effected, effecting permeation of at least a separation fraction of the gaseous supply material-disposed operative material from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space, wherein the permeation of at least a separation fraction of the gaseous supply material-disposed operative material to the permeate receiving space effects production of the gaseous permeate-disposed operative material, and wherein the permeation is effected in response to a differential in chemical potential of the operative material, as between the gaseous supply material receiving space and the permeate receiving space, and wherein the permeation includes transporting of a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane, wherein the carrier-transported fraction of the gaseous supply material-disposed operative material is defined by at least a fraction of the at least a separation fraction of the gaseous supply material-disposed operative material, and while the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is being transported through the membrane and towards the permeate receiving space, and during at least a fraction of the transporting of the at least a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane and towards the permeate receiving space, the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is associated with a carrier material that is dissolved within a liquid material that is disposed within the membrane gel; and~~

1. A permeation process comprising:

effecting fractionation of a gaseous mixture via a membrane such that a permeate and a retentate are obtained, wherein the membrane includes:

a polymeric matrix co-operating with liquid material to define a liquid material-comprising gel; and

a carrier material for facilitating permeation through the membrane; wherein:

the carrier material is dissolved within the liquid material;

the carrier material includes at least one metal cation; and

the at least one metal cation is disposed throughout the polymeric matrix via chelation to, or complexing with, the polymeric matrix;

and

replenishing the liquid material within the membrane, in response to depletion of the liquid material effected during the fractionation, wherein the replenishing includes contacting the membrane with a replenishing liquid material including dissolved carrier material.

2. The process as claimed in claim 1;
wherein the membrane includes a polysaccharide.

3. The process as claimed in claim 1;
wherein the membrane includes chitosan.

4. The process as claimed in any one of claims 1 to 3; wherein the gaseous material is a mixture including an olefin and a paraffin.

5. The process as claimed in any one of claims 1 to 4;
wherein the carrier material includes silver ion.

effecting contacting of the membrane with a replenishment liquid material, wherein the replenishment liquid material includes a replenishment liquid material-disposed carrier material that is dissolved within replenishment liquid material-disposed liquid material, wherein the replenishment liquid material-disposed liquid material of the replenishment liquid material defines liquid material of the replenishment liquid material, and wherein the replenishment liquid material-disposed carrier material that is dissolved within the replenishment liquid material-disposed liquid material defines dissolved carrier material of the replenishment liquid material, such that, in response to the contacting of the membrane with the replenishment liquid material, at least a fraction of the replenishment liquid material becomes disposed within the membrane gel.

2. The process as claimed in claim 1;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected while the supplying of the gaseous supply material to the gaseous supply material receiving space is being effected.

3. The process as claimed in claim 2;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is periodic, such that the minimum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least one of the periods is greater than the maximum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least another one of the periods.

4. The process as claimed in claim 1;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected after the supplying of the gaseous supply material to the gaseous supply material receiving space has been suspended.

5. The process as claimed in claim 4;

further comprising:

6. The process as claimed in any one of claims 1 to 5;
Wherein the carrier material includes copper ion.

7. The process as claimed in any one of claims 1 to 6;
wherein:

the fractionation is effected in response to contacting of the gaseous material with the membrane;

the contacting is effected in response to supplying of the gaseous material to the membrane; and

the replenishing includes replenishing effected while the supplying is being effected.

8. The process as claimed in any one of claims 1 to 7;
wherein:

the fractionation is effected in response to contacting of the gaseous material with the membrane; and

the contacting is effected in response to supplying of the gaseous material to the membrane;

and further comprising:

prior to the replenishing, suspending the supplying, such that the replenishing includes replenishing effected while the supplying is suspended.

9. The process as claimed in any one of claims 1 to 8;
wherein the liquid material includes water.

10. The Process as claimed in any one of claims 1 to 8;
wherein the liquid material is water.

11. The process as claim in claim 10; wherein:
The replenishing liquid material is an aqueous solution.

suspending the effecting of the contacting of the membrane with a replenishment liquid material such that a first liquid replenishment time interval is completed;

after the effecting of the contacting of the membrane with a replenishment liquid material has been suspended, effecting resumption of the supplying of the gaseous supply material to the gaseous supply material receiving space such that, while the resumed supplying of the gaseous supply material to the gaseous supply material receiving space is being effected, the permeation of at least a separation fraction of the gaseous supply material-disposed operative material from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space is effected;

suspending the resumed supplying of the gaseous supply material to the gaseous supply material receiving space; and

after the suspending of the resumed supplying of the gaseous supply material to the gaseous supply material receiving space has been effected, effecting resumption of the effecting of the contacting of the membrane with a replenishment liquid material such that a second liquid replenishment time interval during which the effecting of the contacting of the membrane with a replenishment liquid material is being effected.

6. The process as claimed in claim 5;

wherein the minimum concentration of dissolved carrier material within the replenishment liquid material being supplied during one of the first and second liquid replenishment time intervals is greater than the maximum concentration of dissolved carrier material within the replenishment liquid material being supplied during the other one of the first and second liquid replenishment time intervals.

7. The process as claimed in any one of claim 1 to 6;

wherein the membrane includes a polysaccharide.

8. The process as claimed in any one of claim 1 to 7;

wherein the membrane includes chitosan.

12. The process as claimed in claim 8;

Wherein the suspending of the supplying of the gaseous material to the membrane is with effect that a first fractionation time interval is completed, such that the replenish is effected while the supplying is effected, is effected after the first fractionation time interval; and further comprising:

suspending the effecting of the contacting of the membrane with a replenishment liquid material such that a first liquid replenishment time interval is completed;

after the completion of the first liquid replenishment time interval; , effecting resumption of the supplying of the membrane such that a second fractionation time interval is completed;

suspending the resumed supplying of the gaseous supply material; and

after the completion of the second fractionation time interval, effecting resumption of the replenishing during a second liquid replenishment time interval,

wherein the minimum concentration of dissolved carrier material within the replenishment liquid material being supplied during one of the first and second liquid replenishment time intervals is greater than the maximum concentration of dissolved carrier material within the replenishment liquid material being supplied during the other one of the first and second liquid replenishment time intervals.

13. The process as claimed in claim 12;

wherein the liquid material includes water.

14. The process as claimed in claim 12;

wherein the liquid material is water.

15. The process as claimed in claim 13 or 14;

wherein the replenishment liquid material is an aqueous solution.

16. The process as claimed in any one of claims 1 to 15;

9. The process as claimed in any one of claims I to 8; wherein the operative material includes at least one operative compound.

10. The process as claimed in claim 9;

wherein the at least one operative compound includes an olefin,

11. The process as claimed in any one of claims 1 to 10;

wherein the carrier material includes at least one metal cation.

12. The process as claimed in any one of claims 1 to 10; wherein the carrier material includes at least one of silver ion and copper ion.

13. The process as claimed in any one of claims 1 to 12;

wherein the liquid material includes water.

14. The process as claimed in any one of claims I to 12;

wherein the liquid material is water.

15. The process as claimed in any one of claims 1 to 14; wherein the replenishment liquid material includes an aqueous solution.

16. The process as claimed in any one of claims 1 to 15;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected after at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.

17. The process as claimed in any one of claims 1 to 15;

wherein the replenishing is effected in response to sensing that at least a fraction of the liquid material becomes depleted from the membrane.

17. The process as claimed in any one of claims 1 to 16;

as effected within a membrane module, wherein the supplying of the replenishment liquid material for the effecting of the contacting of the membrane with a replenishment liquid material, is effected by flowing the replenishment liquid material in an upwardly direction.

18. The process as claimed in any one of claims 1 to 17;

wherein the replenishing includes flowing the replenishment liquid material through the membrane and into a space whose pressure is below atmospheric pressure.

19. The process as claimed in any one of claims 1 to 18;

wherein the membrane includes a polysaccharide, and the replenishment liquid material includes an aqueous solution of silver ion having a molar concentration of at least 1.0.

20. The process as claimed in any one of claims 1 to 19;

wherein the replenishment liquid material includes between 10 and 90 weight% water, based on the total weight of the replenishment liquid material.

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected in response to sensing that at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.

18. The process as claimed in any one of claims 1 to 17;

as effected within a membrane module, wherein the gaseous supply material receiving space and the permeate receiving space are defined by respective compartments, wherein the supplying of the replenishment liquid material to either one ❑r both of the gaseous supply material receiving compartment and the permeate receiving compartment, for the effecting of the contacting of the membrane with a replenishment liquid material, is effected by flowing the replenishment liquid material in an upwardly direction.

19. The process as claimed in any one of claims 1 to 18;

wherein the replenishment liquid material is supplied to one of the gaseous supply material receiving space and the permeate receiving space such that transport is effected through the membrane from the one of the gaseous supply material receiving space and the permeate receiving space to the other one of the gaseous supply material receiving space and the permeate receiving space, and wherein the pressure within the other one of the gaseous supply material receiving space and the permeate receiving space is below atmospheric pressure.

20. The process as claimed in any one of claims 1 to 19;

wherein the membrane includes a polysaccharide, and the replenishment liquid material includes an aqueous solution including a molar concentration of silver ion of at least 1.0.

21. The process as claimed in any one of claims 1 to 20;

wherein the replenishment liquid material includes between 10 and 90 weight% water, based on the total weight of the replenishment liquid material.

22. The process as claimed in any one of claims 1 to 21;

wherein the permeation of the at least a separation fraction of the gaseous supply material-disposed operative material is effected while at least one slower-permeating compound is permeating from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space.

23. The process as claimed in claim 22;

wherein the at least a separation fraction of the gaseous supply material-disposed operative material includes at least one operative compound, and wherein, for each one of the at least one operative compound of the at least a separation fraction of the gaseous supply material-disposed operative material, there is provided an operative compound-associated operative ratio defined by the ratio of the molar rate of permeation of the operative compound to the mole fraction of the operative compound within the gaseous supply material receiving space, such that a plurality of operative compound-associated operative ratios are defined, and at least one of the plurality of operative compound-associated operative ratios is a minimum operative compound-associated operative ratio, and wherein for each one of the at least one permeating slower permeating compounds, the ratio of the molar rate of permeation of the slower permeating compound to the mole fraction of the slower permeating compound within the gaseous supply material receiving space is less than the minimum operative compound-associated operative ratio, such that, for each one of the at least one operative compound, the molar concentration of the operative compound within a gaseous permeate, that is permeated from the gaseous supply receiving space, through the membrane, and into the permeate receiving space, is greater than the molar concentration of the operative compound within the gaseous supply material.

24. The process as claimed in claim 22 or 23;

wherein, while the permeating is being effected, the gaseous permeate is discharged from the permeate receiving space as the gaseous permeate product.

25. The process as claimed in any one of claims 22 to 24; wherein

each one of the at least one slower permeating compound is a paraffin..

~~26. A process for effecting separation of at least a gaseous permeate-disposed operative material from a gaseous supply material that is being supplied to a gaseous supply material receiving space that is disposed in mass transfer communication with a permeate receiving space through a membrane, the gaseous supply material including an operative material that defines a gaseous supply material-disposed operative material, and wherein the membrane includes a gel, comprising:~~

~~while supplying the gaseous supply material to the gaseous supply material receiving space and effecting permeation of at least a separation fraction of the gaseous supply material-disposed operative material from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space, wherein the permeation of at least a separation fraction of the gaseous supply material-disposed operative material to the permeate receiving space effects production of the gaseous permeate-disposed operative material, and wherein the permeation is effected in response to a differential in chemical potential of the operative material, as between the gaseous supply material receiving space and the permeate receiving space, and wherein the permeation includes transporting of a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane, wherein the carrier-transported fraction of the gaseous supply material-disposed operative material is defined by at least a fraction of the at least a separation fraction of the gaseous supply material-disposed operative material, and while the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is being transported through the membrane and towards the permeate receiving space, and during at least a fraction of the transporting of the at least a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane and towards the permeate receiving space, the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is associated with a carrier material that is dissolved within a liquid material that is disposed within the membrane gel, periodically, effecting contacting of the membrane with a replenishment liquid material, wherein the replenishment liquid material includes a replenishment liquid material-disposed carrier material that is dissolved within replenishment liquid material-disposed liquid material, wherein the replenishment liquid material-disposed liquid material of the replenishment liquid material defines liquid material of the replenishment liquid material,~~

and wherein the replenishment liquid material disposed carrier material which is dissolved within the replenishment liquid material disposed liquid material defines dissolved carrier material of the replenishment liquid material, such that, in response to the contacting of the membrane with the replenishment liquid material, at least a fraction of the replenishment liquid material becomes disposed within the membrane gel.

27. The process as claimed in claim 26;

wherein the minimum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least one of the periods is greater than the maximum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least another one of the periods.

28. The process as claimed in any one of claim 26 or 27;

wherein the membrane includes a polysaccharide.

29. The process as claimed in any one of claim 26 to 28;

wherein the membrane includes chitosan.

30. The process as claimed in any one of claims 26 to 29; wherein the

operative material includes at least one operative compound.

31. The process as claimed in claim 30;

wherein the at least one operative compound includes an olefin.

32. The process as claimed in any one of claims 26 to 31;

wherein the carrier material includes at least one metal cation.

33. The process as claimed in any one of claims 26 to 31; wherein the

carrier material includes at least one of silver ion and copper ion.

34. The process as claimed in any one of claims 26 to 33;

wherein the liquid material includes water.

35. The process as claimed in any one of claims 26 to 33;

wherein the liquid material is water.

36. The process as claimed in any one of claims 26 to 35; wherein

the replenishment liquid material includes an aqueous solution.

37. The process as claimed in any one of claims 26 to 36;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected after at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.

38. The process as claimed in any one of claims 26 to 36;

wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected in response to sensing that at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.

39. The process as claimed in any one of claims 26 to 38;

effected within a membrane module, wherein the gaseous supply material receiving space and the permeate receiving space are defined by respective compartments, wherein the supplying of the replenishment liquid material to either one or both of the gaseous supply material receiving compartment and the permeate receiving compartment, for the effecting of the contacting of the membrane with a replenishment liquid material, is effected by flowing the replenishment liquid material in an upwardly direction.

40. The process as claimed in any one of claims 26 to 39;

wherein the replenishment liquid material is supplied to one of the gaseous supply material receiving space and the permeate receiving space such that transport is effected through the

membrane from the one of the gaseous supply material receiving space and the permeate receiving space to the other one of the gaseous supply material receiving space and the permeate receiving space, and wherein the pressure within the other one of the gaseous supply material receiving space and the permeate receiving space is below atmospheric pressure.

41. The process as claimed in any one of claims 26 to 40;

wherein the membrane includes a polysaccharide, and the replenishment liquid material includes an aqueous solution including a molar concentration of silver ion of at least 1.0.

42. The process as claimed in any one of claims 26 to 41;

wherein the replenishment liquid material includes between 10 and 90 weight% water, based on the total weight of the replenishment liquid material.

43. The process as claimed in any one of claims 26 to 42;

wherein the permeation of the at least a separation fraction of the gaseous supply material-disposed operative material is effected while at least one slower-permeating compound is permeating from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space.

44. The process as claimed in claim 43;

wherein the at least a separation fraction of the gaseous supply material-disposed operative material includes at least one operative compound, and wherein, for each one of the at least one operative compound of the at least a separation fraction of the gaseous supply material-disposed operative material, there is provided an operative compound-associated operative ratio defined by the ratio of the molar rate of permeation of the operative compound to the mole fraction of the operative compound within the gaseous supply material receiving space, such that a plurality of operative compound-associated operative ratios are defined, and at least one of the plurality of operative compound-associated operative ratios is a minimum operative compound-associated operative ratio, and wherein for each one of the at least one permeating slower permeating compounds, the ratio of the molar rate of

permeation of the slower permeating compound to the mole fraction of the slower permeating compound within the gaseous supply material receiving space is less than the minimum operative compound-associated operative ratio, such that, for each one of the at least one operative compound, the molar concentration of the operative compound within a gaseous permeate, that is permeated from the gaseous supply receiving space, through the membrane, and into the permeate receiving space, is greater than the molar concentration of the operative compound within the gaseous supply material.

45. The process as claimed in claim 43 or 44;

wherein, while the permeating is being effected, the gaseous permeate is discharged from the permeate receiving space as the gaseous permeate product.

46. The process as claimed in any one of claims 43 to 45; wherein

each one of the at least one slower permeating compound is a paraffin..

47. A process for effecting separation of at least a gaseous permeate-disposed operative material from a gaseous supply material that is being supplied to a gaseous supply material receiving space that is disposed in mass transfer communication with a permeate receiving space through a membrane, the gaseous supply material including an operative material that defines a gaseous supply material-disposed operative material, and wherein the membrane includes a gel, comprising a repeating set of steps, the repeating set of steps comprising:

supplying the gaseous supply material to the gaseous supply material receiving space and, while the supplying of the gaseous supply material to the gaseous supply material receiving space is being effected, effecting permeation of at least a separation fraction of the gaseous supply material-disposed operative material from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space, wherein the permeation of at least a separation fraction of the gaseous supply material-disposed operative material to the permeate receiving space effects production of the gaseous permeate-disposed operative material, and wherein the permeation is effected in response to a differential in partial pressure of the operative material, as between the gaseous supply

material receiving space and the permeate receiving space, and wherein the permeation includes transporting of a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane, wherein the carrier-transported fraction of the gaseous supply material-disposed operative material is defined by at least a fraction of the at least a separation fraction of the gaseous supply material-disposed operative material, and while the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is being transported through the membrane and towards the permeate receiving space, and during at least a fraction of the transporting of the at least a carrier-transported fraction of the gaseous supply material-disposed operative material through the membrane and towards the permeate receiving space, the at least a carrier-transported fraction of the gaseous supply material-disposed operative material is associated with a carrier material that is dissolved within a liquid material that is disposed within the membrane gel;

suspending the supplying of the gaseous supply material to the gaseous supply material receiving space;

after the suspension of the supplying of the gaseous supply material has been effected, effecting contacting of the membrane with a replenishment liquid material, wherein the replenishment liquid material includes a replenishment liquid material-disposed carrier material that is dissolved within replenishment liquid material-disposed liquid material, wherein the replenishment liquid material-disposed liquid material of the replenishment liquid material defines liquid material of the replenishment liquid material, and wherein the replenishment liquid material-disposed carrier material that is dissolved within the replenishment liquid material-disposed liquid material defines dissolved carrier material of the replenishment liquid material, such that, in response to the contacting of the membrane with the replenishment liquid material, at least a fraction of the replenishment liquid material becomes disposed within the membrane gel; and

suspending the effecting of the contacting of the membrane with a replenishment liquid material.

48. The process as claimed in claim 47;

~~wherein the repeating set of steps is completed at least twice such that at least two completed sets of steps are defined, and wherein the minimum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least one of the at least two completed sets of steps is greater than the maximum concentration of dissolved carrier material within the replenishment liquid material being supplied during at least another one of the at least two completed sets of steps.~~

~~49. The process as claimed in any one of claim 47 to 48;~~

~~wherein the membrane includes a polysaccharide.~~

~~50. The process as claimed in any one of claim 47 to 49;~~

~~wherein the membrane includes chitosan.~~

~~51. The process as claimed in any one of claims 47 to 50; wherein the~~

~~operative material includes at least one operative compound.~~

~~52. The process as claimed in claim 50;~~

~~wherein the at least one operative compound includes an olefin.~~

~~53. The process as claimed in any one of claims 47 to 52;~~

~~wherein the carrier material includes at least one metal cation.~~

~~54. The process as claimed in any one of claims 47 to 52; wherein the~~

~~carrier material includes at least one of silver ion and copper ion.~~

~~55. The process as claimed in any one of claims 47 to 53;~~

~~wherein the liquid material includes water.~~

~~56. The process as claimed in any one of claims 47 to 53;~~

~~wherein the liquid material is water.~~

~~57. The process as claimed in any one of claims 47 to 56; wherein the replenishment liquid material includes an aqueous solution.~~

~~58. The process as claimed in any one of claims 47 to 57;~~

~~wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected after at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.~~

~~59. The process as claimed in any one of claims 47 to 57;~~

~~wherein the effecting of the contacting of the membrane with a replenishment liquid material is effected in response to sensing that at least a fraction of the liquid material, which is disposed within the membrane gel, becomes depleted.~~

~~60. The process as claimed in any one of claims 47 to 59;~~

~~effected within a membrane module, wherein the gaseous supply material receiving space and the permeate receiving space are defined by respective compartments, wherein the supplying of the replenishment liquid material to either one or both of the gaseous supply material receiving compartment and the permeate receiving compartment, for the effecting of the contacting of the membrane with a replenishment liquid material, is effected by flowing the replenishment liquid material in an upwardly direction.~~

~~61. The process as claimed in any one of claims 47 to 60;~~

~~wherein the replenishment liquid material is supplied to one of the gaseous supply material receiving space and the permeate receiving space such that transport is effected through the membrane from the one of the gaseous supply material receiving space and the permeate receiving space to the other one of the gaseous supply material receiving space and the permeate receiving space, and wherein the pressure within the other one of the gaseous supply material receiving space and the permeate receiving space is below atmospheric pressure.~~

62. The process as claimed in any one of claims 47 to 61;

wherein the membrane includes a polysaccharide, and the replenishment liquid material includes an aqueous solution including a molar concentration of silver ion of at least 1.0.

63. The process as claimed in any one of claims 47 to 62;

wherein the replenishment liquid material includes between 10 and 90 weight% water, based on the total weight of the replenishment liquid material.

64. The process as claimed in any one of claims 47 to 63;

wherein the permeation of the at least a separation fraction of the gaseous supply material-disposed operative material is effected while at least one slower-permeating compound is permeating from the gaseous supply material receiving space, through the membrane, and into the permeate receiving space.

65. The process as claimed in claim 64;

wherein the at least a separation fraction of the gaseous supply material-disposed operative material includes at least one operative compound, and wherein, for each one of the at least one operative compound of the at least a separation fraction of the gaseous supply material-disposed operative material, there is provided an operative compound-associated operative ratio defined by the ratio of the molar rate of permeation of the operative compound to the mole fraction of the operative compound within the gaseous supply material receiving space, such that a plurality of operative compound-associated operative ratios are defined, and at least one of the plurality of operative compound-associated operative ratios is a minimum operative compound-associated operative ratio, and wherein for each one of the at least one permeating slower-permeating compounds, the ratio of the molar rate of permeation of the slower permeating compound to the mole fraction of the slower-permeating compound within the gaseous supply material receiving space is less than the minimum operative compound-associated operative ratio, such that, for each one of the at least one operative compound, the molar concentration of the operative compound within a gaseous permeate, that is permeated from the gaseous supply receiving space, through the

membrane, and into the permeate receiving space, is greater than the molar concentration of the operative compound within the gaseous supply material.

66. The process as claimed in claim 64 or 65;

wherein, while the permeating is being effected, the gaseous permeate is discharged from the permeate receiving space as the gaseous permeate product.

67. The process as claimed in any one of claims 64 to 66; wherein

each one of the at least one slower permeating compound is a paraffin.

68. A permeation process comprising:

effecting permeation of an operative material through a membrane including a liquid material-comprising gel, such that while the permeation is being effected, the operative material is associated with carrier material that is dissolved within the liquid material; and

replenishing the liquid material within the membrane, as the liquid material becomes depleted, wherein the replenishing includes contacting the membrane with a replenishing liquid material including dissolved carrier material.

69. The process as claimed in claim 68;

wherein the membrane includes a polysaccharide.

70. The process as claimed in claim 68;

wherein the membrane includes chitosan.

71. The process as claimed in any one of claims 68 to 70; wherein the

operative material includes at least one operative compound.

72. The process as claimed in claim 70;

wherein the at least one operative compound includes an olefin.

~~73. The process as claimed in any one of claims 68 to 72;~~

~~wherein the carrier material includes at least one metal cation.~~

~~74. The process as claimed in any one of claims 68 to 72; wherein the~~

~~carrier material includes at least one of silver ion and copper ion.~~

~~75. The process as claimed in any one of claims 68 to 73;~~

~~wherein the liquid material includes water.~~

~~76. The process as claimed in any one of claims 68 to 73;~~

~~wherein the liquid material is water.~~

~~77. The process as claimed in any one of claims 68 to 76; wherein~~

~~the replenishment liquid material includes an aqueous solution.~~