What is claimed is:

1. A method of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, comprising:

maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,

thereby producing a stabilized product, e.g., an isolated, stabilized protein.

2. A method of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, comprising:

providing, e.g., establishing, a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-exponential growth culture phase of a production culture, and

maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,

thereby producing a stabilized product, e.g., an isolated, stabilized protein.

3. The method of either of claims 1 or 2, wherein the method further comprises establishing a dissolved oxygen tension (DOT) in the range of greater than 40% to less than 500% air saturation during separation of cells from production culture.

4. A method of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, comprising:

providing, e.g., establishing a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-exponential growth culture phase of the production culture, wherein dissolved oxygen tension (DOT) from start of the production phase to the end of the production phase is in a range of greater than 40% to 70% air saturation ;

cooling the production culture at the end of production phase to a $T_{harvest}$ temperature, which is a temperature that is below the temperature at which the cell line was or is normally cultured;

increasing the DOT to a range of greater than 40% to less than 500% air saturation by sparging air or O_2 gas into the production culture until separation of cells from production culture and collection of supernatant; and

maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,

thereby producing a stabilized product, e.g., an isolated, stabilized protein.

5. The method of any of claims 1-4, wherein the method further comprises providing, e.g., adding, transition metals in or to the production culture, wherein the transition metal ions are selected from Zn^{2+}, Mn^{4+}, Cu^{2+}, Fe^{3+}, Co^{2+}, Cr^{3+}, and/or Ni^{2+}.

6. The method of any of claims 1-5, wherein the DOT is further maintained by one or more actions selected from the group consisting of: inhibiting sparged nitrogen gas flow if active, inhibiting on demand alkali control if active, inhibiting on demand CO2 gas flow control if active, by inhibiting feed addition if active, activating head space pressure if not active, and activating head space flow of air/O_2 if not active.

7. A method of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, comprising:

(i) providing, e.g., establishing, a production culture, e.g., a post-exponential growth culture, comprising a recombinant host cell expressing the product, e.g., a protein, at a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product;

(ii) maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-growth culture phase; and

(iii) maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,

wherein the method comprises:

a. cooling the production culture after exponential growth phase has occurred, to a temperature $T_{production}$ of 30°C to 33°C, which is a temperature that is below the temperature at which the cell line was or is normally cultured;

b. oxygenating the production culture, to an dissolved oxygen tension (DOT) greater than 40% to less than or equal to 70% air saturation from start of the production phase to the end of the production phase;

c. providing, e.g., adding, transition metals in or to the production culture, wherein the transition metals are selected from Zn^{2+}, Mn^{4+}, Cu^{2+}, Fe^{3+}, Co^{2+}, Cr^{3+}, and/or Ni^{2+};

d. providing, e.g., adding, dehydroascorbic acid or ascorbic acid, or a dehydroascorbic acid or ascorbic acid modifying component, to the production culture;

e. providing, e.g., adding glutathione, e.g., oxidized and/or reduced glutathione, or a glutathione modifying component, to the production culture; or

f. cooling the production culture for separation of cells from production culture and collection of supernatant to a temperature $T_{harvest}$ of 12°C-18°C, which is a temperature that is below $T_{production}$,

thereby producing a stabilized product, e.g., an isolated, stabilized protein or a preparation of a stabilized product, e.g., a stabilized protein.

8. The method of claim 7, wherein the method comprises a, b, and f.

9. The method of claim 7, wherein the method comprises a, c, and f.

10. The method of claim 7, wherein the method comprises b and c.

11. The method of claim 7, wherein the method comprises a, b, c, and f.

12. The method of any of claims 1-11, wherein the production culture has an oxygenation level of at least 10%, at least 30%, or between 30% and 70% air saturation.

13. The method of claim 12 wherein the oxygenation level is greater than 40% to less than or equal to 70% air saturation.

14. The method of any of claims 4-13, wherein the transition metals are Zn^{2+}, Mn^{2+}, and/or Cu^{2+}.

15. The method of any of claims 4-14, wherein Zn^{2+} is present at a concentration of 200 to 400 μM.

16. The method of any of claims 4-15, wherein Mn^{2+} is present at a concentration of 10-100 μM.

17. The method of any of claims 4-16, wherein Cu^{2+} is present at a concentration of 10-100 μM.

18. The method of any of claims 4-17, wherein Zn^{2+} is present at a concentration of 200 to 400 μM, Mn^{2+} is present at a concentration of 10-100 μM, and Cu^{2+} is present at a concentration of 10-100 μM.

19. The method of any of claims 1-18, wherein the stabilized protein comprises an N^{th} cysteine residue and an $N+1^{th}$ cysteine residue, wherein N= 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 , 19, 20, 30, 40, 50, 60, 70, 80, 90, 100 or more, e.g., N = 1 or N = 3.

20. The method of claim 19, wherein, in native form, the stabilized protein comprises a disulfide bond between the N^{th} cysteine residue and an $N+1^{th}$ cysteine residue.

21. The method of claim 20, wherein:

i) N = 1, and in native form, the polypeptide comprises a disulfide bond between a first cysteine residue and a second cysteine residue;

ii) N = 3, and in native form, the polypeptide comprises a disulfide bond between a third cysteine residue and a fourth cysteine residue; or

iii) N = 3, and in native form, the polypeptide comprises a disulfide bond between a first cysteine residue and a second cysteine residues and a disulfide bond between a third cysteine residue and a fourth cysteine residue.

22. The method of any of claims 1-21, wherein at least 80, 85, 90, 95, 96, 97, 98, or 99% by weight of the stabilized product, e.g., stabilized protein, is in a predetermined state, e.g., native confirmation, e.g., as determined by size separation, e.g., by gel electrophoresis, e.g., by non-reducing gel electrophoresis.

23. The method of any of claims 1-22, wherein the product is an antibody, and at least 80, 85, 90, 95, 96, 97, 98, or 99% by weight of the antibody is in a predetermined state, e.g., native confirmation, e.g., as determined by size separation, e.g., by gel electrophoresis, e.g., by non-reducing gel electrophoresis.

24. The method of any of claims 1-23, wherein the product is an antibody, and at least 80, 85, 90, 95, 96, 97, 98, or 99% by weight of the antibody is a tetramer comprising two chains each comprising a light chain variable region and two chains each comprising a heavy chain variable region.

25. The method of any of claims 4-24, wherein $T_{harvest}$ is sufficiently low to inhibit dissociation of the disulfide bond.

26. The method of any of claims 4-25, comprising separating the cells, from the production culture at $T_{harvest}$.

27. The method of any of claims 4-26, wherein the cell line is cultured at a first temperature, $T_{culture}$, and is harvested at $T_{harvest}$.

28. The method of claim 27, wherein $T_{harvest}$ is at least 19°to 25° C below $T_{culture}$.

29. The method of any of claims 4-28, wherein $T_{harvest}$ is 12°C-18°C, e.g., 15°C.

30. The method of any of claims 27-29, wherein $T_{culture}$ is 30°C-38°C.

31. The method of any of claims 4-30, wherein the protein, e.g., as a component of the supernatant, is applied to a filter at $T_{harvest}$.

32. The method of any of claims 1-31, wherein the cells are cultured in a bioreactor.

33. The method of claim 32, wherein the contents of the bioreactor are cooled to $T_{harvest}$ after production phase.

34. The method of claim 32, wherein the cell culture is cooled by contact with a member, e.g., a cooling jacket, comprising a fluid, e.g., water, at a temperature suitable for bring the cell culture to $T_{harvest}$.

35. The method of any of claims 32-34, wherein the bioreactor has a volume of 1-250 milliliters, 250 milliliters to 50 liters, 50 to 800 liters, or 800-200,000 liters.

36. The method of any of claims 32-35, wherein the bioreactor is a single use bioreactor, e.g., a bioreactor designed to allow incubation of a cell culture and thereafter being disposed, e.g., as described herein.

37. The method of any of claims 32-36, wherein the bioreactor comprises a bioprocess container, a shell, at least one agitator, at least one sparger, at least one gas filter inlet port for the

sparger(s) and headspace overlay, at least one fill port, at least one harvest port, at least one sample port, and at least one probe.

38. The method of any of claims 32-37, wherein the bioreactor comprises processes and probes for monitoring and maintaining one or more parameters, e.g., pH, dissolved oxygen tension (DOT), or temperature.

39. The method of any of claims 32-37, wherein the bioreactor is a self-supporting biocompatible tank having a volume of at least 4000 L and at least one top impeller and at least one bottom impeller, and wherein the at least one top impeller is a hydrofoil impeller, and wherein an impeller spacing (D_s) between the top impeller and the bottom impeller is at least 1.229x the diameter of the bottom impeller (D_{bottom}) and at most $2xD_{bottom}$, wherein a liquid height above the top impeller (D_o) is at least 0.3x the diameter of the top impeller (D_{top}) and at most $2.5xD_{top}$, and wherein a bottom clearance (D_c) between the tank bottom and the center-line of the bottom impeller is at least $0.35xD_{bottom}$.

40. The method of any of claims 32-39, wherein the bioreactor is operably coupled to a harvest vessel.

41. The method of claim 40, wherein the harvest vessel is configured to comprise or provide a head space above the reservoir culture, e.g., wherein the head space comprises a gas, e.g., air or oxygen, or a mixture of gases, e.g., air or air and oxygen.

42. The method of claim 41, wherein the harvest vessel is configured to allow collection of supernatant though a J-tube port into the head space such that the supernatant travels or cascades down the wall(s) of the harvest vessel.

43. The method of claim 42, wherein supernatant is transmitted onto a surface of the harvest vessel, e.g., a wall, in the head space, and flows along the surface, back to the reservoir culture.

44. The method of claim 43, wherein supernatant travel or cascade in the harvest vessel results in an increase in oxygenation level of the supernatant.

45. The method of any of claims 40-44, wherein the DOT of the supernatant is maintained at a range of greater than 40% to less than 500% air saturation in the harvest vessel through surface aeration.

46. The method of any of claims 40-45, wherein the harvest vessel comprises a cooling device and mechanism to further cool the reservoir culture to a temperature of 5 °to 8°C.

47. The method of any of claims 40-46, wherein the harvest vessel comprises a mixer device capable of axial mixing and an pH titrant addition port.

48. The method of any of claims 40-47, wherein the harvest vessel comprises at least one head space gas inlet port and at least one gas outlet port.

49. The method of any of claims 40-48, wherein the harvest vessel further comprises at least one air flow controller and at least one O_2 flow controller to provide an air and O_2 mix.

50. The method of any of claims 40-49, wherein the harvest vessel comprises sensors that detect DOT, redox, temperature and pH of the supernatant.

51. The method of claim 50, wherein the DOT, redox, temperature and pH sensor output are used to effect change in the sparge rates, head space, and feed or supplement addition into the bioreactor production culture prior to separation; and addition of pH titrant into the harvest vessel.

52. The method of claim 50, wherein the DOT, redox, temperature and pH sensor output are used to effect change addition of pH titrant into the harvest vessel.

53. The method of any of claims 40-52, wherein the bioreactor is connected to the harvest vessel using a tubing resistant to occlusion.

54. The method of claim 53, wherein the tubing resistant to occlusion is braided.

55. The method of any of claims 40-54, wherein the flow path between the bioreactor and the harvest vessel comprises installations of DOT and redox sensors/probes.

56. The method of claim 55, wherein the DOT and redox sensors/probes output is used to effect change in the sparge rates, head space, and feed or supplement addition into the bioreactor production culture prior to harvest.

57. The method of any of claims 40-56, wherein the bioreactor comprises an element, e.g., a line or nozzle, configured to deliver culture to a surface defining the headspace of the bioreactor.

58. The method of any of claims 40-57, wherein the bioreactor comprises a second element, e.g., a line or nozzle, configured to deliver culture to a surface defining the headspace of the bioreactor.

59. The method of any of claims 1-58, further comprising monitoring the redox potential of cells within the culture and while isolating the protein for the purpose of maintaining the redox potential.

60. The method of claim 59, wherein monitoring the redox potential comprises using in-line monitoring probes, e.g., Mettler Toledo as described herein.

61. The method of claim 58, wherein monitoring the redox potential comprises evaluating redox status of the cellular factors that impact product stability wherein the cellular factors may compromise an enzyme or metabolic cofactor of the glutathione/reduced glutathione pathway, thioredoxin/reduced thioredoxin pathway, or pentose phosphate pathways (e.g., glutathione reductase, thioredoxin, glucose-6-phosphate, NADPH, NADP+, 6-phosphonoglucolactone, 6-phosphogluconate, or ribulose-5-phosphate).

62. The method of any of claims 1-61, wherein the recombinant host cell is a CHO-K1 cell, a CHO-K1 SV cell, a DG44 CHO cell, a DUXB11 CHO cell, a CHOS, a CHO GS knock-out cell, a CHO FUT8 GS knock-out cell, a CHOZN, or a CHO-derived cell. The CHO GS knock-out cell (e.g., GSKO cell) is, for example, a CHO-K1SV GS knockout cell (Lonza Biologics, Inc.). The CHO FUT8 knockout cell is, for example, the Potelligent® CHOK1 SV (Lonza Biologics, Inc.).

63. The method of any of claims 1-61, wherein the recombinant host cell is a CHO-GSKO cell, a CHOXceed cell CHO GS knock-out cell (e.g., GS-CHO cell) is, for example, a

CHO-K1SV GS knockout cell (Lonza Biologics, Inc.). The CHO FUT8 knockout cell is, for example, the Potelligent® CHOK1 SV (Lonza Biologics, Inc.).

64. The method of any of claims 1-61, wherein the recombinant host cell is a HeIa, HEK293, HT1080, H9, HepG2, MCF7, Jurkat, NIH3T3, PC12, PER.C6, BHK (baby hamster kidney cell), VERO, SP2/0, NS0, YB2/0, Y0, EB66, C127, L cell, COS, e.g., COS1 and COS7, QC1-3, CHOK1, CHOK1SV, Potelligent CHOK1SV, CHO GS knockout, CHOK1SV GS-KO, CHOS, CHO DG44, CHO DXB11, and CHOZN, or any cells derived therefrom.

65. A stabilized protein produced by the method of any of claims 1-64.

66. A pharmaceutical composition comprising the stabilized protein of claim 65.

67. The pharmaceutical composition of claim 66, further comprising a pharmaceutically acceptable carrier, diluent, or excipient.

68. A bioreactor capable of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, wherein the bioreactor is capable of maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,.

69. A bioreactor capable of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, wherein the bioreactor is capable of:

providing, e.g., establishing, a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-exponential growth culture phase of a production culture, and

maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection

of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant.

70. The bioreactor of either of claims 68 or 69, wherein the bioreactor is capable of establishing a dissolved oxygen tension (DOT) in the range of greater than 40% to less than 500% air saturation during separation of cells from production culture.

71. A bioreactor capable of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, wherein the bioreactor is capable of:

providing, e.g., establishing a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-exponential growth culture phase of the production culture, wherein dissolved oxygen tension (DOT) from start of the production phase to the end of the production phase is in a range of greater than 40% to 70% air saturation;

cooling the production culture at the end of production phase to a $T_{harvest}$ temperature, which is a temperature that is below the temperature at which the cell line was or is normally cultured;

increasing the DOT to a range of greater than 40% to less than 500% air saturation by sparging air or O_2 gas into the production culture until removal of the production culture from the bioreactor; and

maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant.

72. The bioreactor of any of claims 68-71, wherein the bioreactor is further capable of providing, e.g., adding, transition metals in or to the production culture, wherein the transition metals are selected from Zn^{2+}, Mn^{4+}, Cu^{2+}, Fe^{3+}, Co^{2+}, Cr^{3+}, and/or Ni^{2+}.

73. The bioreactor of any of claims 68-72, wherein the bioreactor is further capable of maintaining the DOT by one or more actions selected from the group consisting of: inhibiting sparged nitrogen gas flow, inhibiting on demand alkali control if active, inhibiting on demand CO2 gas flow control if active, by inhibiting feed addition if active, activating head space pressure if not active, and activating head space flow of air/O_2 if not active.

74. A bioreactor capable of producing a stabilized product, e.g., a stabilized protein, expressed in a recombinant host cell, wherein the bioreactor is capable of:

(i) providing, e.g., establishing, a production culture, e.g., a post-exponential growth culture, comprising a recombinant host cell expressing the product, e.g., a protein, at a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product;

(ii) maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product in a post-growth culture phase; and

(iii) maintaining a redox potential difference in the range of -50mV to -300mV from a non-stabilized product to a stabilized product during separation of cells from production culture and collection of a supernatant, wherein separation of cells from a production culture and collection of supernatant is conducted without sparging or sufficiently little sparging that the sparging does not substantially alter the redox potential in the production culture and the supernatant,

wherein the bioreactor is further capable of:

a. cooling the production culture after exponential growth phase has occurred, to a temperature of 30°C to 33°C, which is a temperature that is below the temperature at which the cell line was or is normally cultured;

b. oxygenating the production culture, to an dissolved oxygen tension (DOT) greater than 40% to less than or equal to 70% air saturation from start of the production phase to the end of the production phase;

c. providing, e.g., adding, transition metals in or to the production culture, wherein the transition metals are selected from Zn^{2+}, Mn^{4+}, Cu^{2+}, Fe^{3+}, Co^{2+}, Cr^{3+}, and/or Ni^{2+};

d. providing, e.g., adding, dehydroascorbic acid or ascorbic acid, or a dehydroascorbic acid or ascorbic acid modifying component, to the production culture;

e. providing, e.g., adding glutathione, e.g., oxidized and/or reduced glutathione, or a glutathione modifying component, to the production culture; or

f. cooling the production culture for separation of cells from production culture and collection of supernatant to a temperature $T_{harvest}$ of 12°C-18°C, which is a temperature that is below $T_{production}$.

75. The bioreactor of claim 74, wherein the bioreactor is capable of a, b, and f.

76. The bioreactor of claim 74, wherein the bioreactor is capable of a, c, and f.

77. The bioreactor of claim 74, wherein the bioreactor is capable of b and c.

78. The bioreactor of claim 74, wherein the bioreactor is capable of a, b, c, and f.

79. The bioreactor of any of claims 68-77, wherein the bioreactor is operably coupled to a harvest vessel.

80. The bioreactor of claim 79, wherein the harvest vessel is configured to comprise or provide a head space above the reservoir culture, e.g., wherein the head space comprises a gas, e.g., air or oxygen, or a mixture of gases, e.g., air or air and oxygen.

81. The bioreactor of claim 80, wherein the bioreactor is configured to allow circulation of culture into the head space such that the culture travels or cascades down the wall(s) of the harvest vessel.

82. The bioreactor of claim 81, wherein culture from the reservoir culture is transmitted onto a surface of the bioreactor, e.g., a wall, in the head space, and flows along the surface, back to the reservoir culture.

83. The bioreactor of claim 82, wherein travel or cascade results in an increase in oxygenation level in the culture.

84. The bioreactor of any of claims 79-83, wherein the harvest vessel is capable of maintaining the DOT of the reservoir culture at a range of greater than 40% to less than 500% air saturation through surface aeration.

85. The bioreactor of any of claims 79-84, wherein the harvest vessel comprises one or more of the components selected from the group consisting of: a cooling device and mechanism to further cool the reservoir culture to a temperature of 5 °to 8°C; a mixer device capable of axial mixing and an pH titrant addition port; at least one head space gas inlet port and at least one gas outlet port; at least one air flow controller and at least one O_2 flow controller to provide an air and O_2 mix; and sensors that detect DOT, redox, temperature and pH of the supernatant.

86. The bioreactor of claim 85, wherein the DOT, redox, temperature and pH sensor output are capable of effecting change in the sparge rates, head space, and feed or supplement addition into the bioreactor production culture prior to separation; and addition of pH titrant into the harvest vessel.

87. The bioreactor of claim 85, wherein the DOT, redox, temperature and pH sensor output are capable of effecting addition of pH titrant into the harvest vessel.

88. The bioreactor of any of claims 79-87, wherein the bioreactor is connected to the harvest vessel using a tubing resistant to occlusion.

89. The bioreactor of claim 88, wherein the tubing resistant to occlusion is braided.

90. The bioreactor of any of claims 79-88, wherein the flow path between the bioreactor and the harvest vessel comprises installations of DOT and redox sensors/probes.

91. The bioreactor of any of claims 79-90, comprising an element, e.g., a line or nozzle, configured to deliver culture to a surface defining the head space of the harvest vessel.

92. The bioreactor of any of claims 79-91, comprising a second element, e.g., a line or nozzle, configured to deliver culture to a surface defining the head space of the harvest vessel.

93. The bioreactor of any of claims 68-92, wherein the bioreactor is a single use bioreactor, e.g., a bioreactor designed to allow incubation of a cell culture and thereafter being disposed, e.g., as described herein.

94. The bioreactor of any of claims 68-93, wherein the bioreactor comprises a bioprocess container, a shell, at least one agitator, at least one sparger, at least one gas filter inlet port for the sparger(s) and headspace overlay, at least one fill port, at least one harvest port, at least one sample port, and at least one probe.

95. The bioreactor of any of claims 68-92, wherein the bioreactor is a self-supporting biocompatible tank having a volume of at least 4000 L and at least one top impeller and at least one bottom impeller, and wherein the at least one top impeller is a hydrofoil impeller, and wherein an impeller spacing (D_s) between the top impeller and the bottom impeller is at least 1.229x the diameter of the bottom impeller (D_{bottom}) and at most $2xD_{bottom}$, wherein a liquid height above the top impeller (D_o) is at least 0.3x the diameter of the top impeller (D_{top}) and at most $2.5xD_{top}$, and wherein a bottom clearance (D_c) between the tank bottom and the center-line of the bottom impeller is at least $0.35xD_{bottom}$.