CLAIMS:

1. An in-line blending process for polymers comprising:

(a) providing two or more reactor trains configured in parallel and a high- pressure separator downstream fluidly connected to the two or more reactor trains configured in parallel;

(b) contacting in the two or more reactor trains configured in parallel 1) olefin monomers having two or more carbon atoms 2) one or more catalyst systems, 3) optional one or more comonomers, 4) optional one or more scavengers, and 5) optional one or more inert diluents or inert solvents,

wherein the polymerization system for at least one of the reactor trains configured in parallel is at a temperature above the solid-fluid phase transition temperature, at a pressure no lower than 10 MPa below the cloud point pressure and less than 1500 MPa, is in its dense fluid state, and is above its critical temperature and critical pressure,

wherein at least one of the reactor trains includes an olefin monomer that has three or more carbon atoms,

wherein the polymerization system for each reactor train comprises the olefin monomers, any comonomer present, any inert diluent or inert solvent present, any scavenger present, and the polymer product,

wherein the catalyst system for each reactor train comprises one or more catalyst precursors, one or more activators, and optionally, one or more catalyst supports;

wherein the one or more catalyst systems are chosen from Ziegler Natta catalysts, metallocene catalysts, nonmetallocene metal-centered, heteroaryl ligand catalysts, late transition metal catalysts, and combinations thereof;

(c) forming a reactor effluent including a homogeneous fluid phase polymer-monomer mixture in each parallel reactor train;

(d) combining the reactor effluent comprising the homogeneous fluid phase polymer-monomer mixture from each parallel reactor train to form a combined reactor effluent;

(e) passing the combined reactor effluent through the high-pressure separator for product blending and product-feed separation;

(f) maintaining the temperature and pressure within the high-pressure separator above the solid-fluid phase transition point but below the cloud point pressure and temperature to form a fluid-fluid two-phase system comprising a polymer-rich blend phase and a monomer-rich phase; and

(g) separating the monomer-rich phase from the polymer-rich blend phase to form a polymer blend and a separated monomer-rich phase.

2. The process of claim 1 wherein in (b) the polymerization system for the at least one of the reactor trains configured in parallel comprises less than 40 wt % of optional one or more inert solvents.

3. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa.

4. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa, and comprise less than 40 wt % of optional one or more inert solvents.

5. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than

10 MPa below the cloud point pressures and less than 1500 MPa, and are above their critical temperatures and critical pressures.

6. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa, comprise less than 40 wt % of optional one or more inert solvents, and are above their critical temperatures and critical pressures.

7. The process of claim 1 wherein the two or more reactor trains configured in parallel of (b) includes one or more reactor trains operating at a temperature below the solid-fluid phase transition temperature of the polymerization system forming solid polymer particles and the polymerization system comprises less than 40 wt % of optional one or more inert solvents.

8. The process of claim 1 wherein the olefin monomers having three or more carbon atoms of (b) comprise propylene.

9. The process of claim 1 wherein the optional one or more comonomers of (b) comprise one or more of ethylene, propylene, butenes, hexenes, octenes, decenes, or dodecenes.

10. The process of claim 1 further comprising recycling the separated monomer-rich phase to the polymerization systems of the two or more reactor trains configured in parallel.

11. The process of claim 10 further comprising removing low molecular weight oligomers, low molecular weight polymers or combinations thereof from the separated monomer-rich phase.

12. The process of claim 11 wherein the low molecular weight oligomers, low molecular weight polymers or combinations thereof are removed through the use of at least one knock-out pot.

13. The process of claim 1 further comprising feeding the combined reactor effluent of (d) through a static mixer between (d) and (e).

14. The process of claim 1 further comprising feeding a catalyst killer to one or more of the reactor effluents from one or more parallel reactor trains of (c).

15. The process of claim 1 further comprising providing one or more storage tanks, and feeding from the one or more storage tanks one or more polymers and/or polymer additives to the process after (c).

16. The process of claim 1 further comprising a pressure letdown valve for each reactor train configured in parallel positioned before the high-pressure separator.

17. The process of claim 1 further comprising feeding the polymer-rich phase of the high-pressure separator containing the polymer blend to one or more low-pressure separators to further separate the monomers and other volatiles from the polymer blend to form a further-enriched polymer blend.

18. The process of claim 17 further comprising feeding the further-enriched polymer blend to a coupled devolatizer to further separate other volatiles from the further-enriched polymer blend to form a polymer product blend.

19. The process of claim 18 wherein the coupled devolatilizer operates under vacuum enabling the further-enriched polymer blend to flash off the monomers and other volatiles.

20. The process of claim 19 wherein the coupled devolatilizer is a devolatizing extruder.

21. The process of claim 20 wherein one or more polymer additives are added to the polymer product blend at the high-pressure separator, the low-pressure separator, the devolatizing extruder or combinations thereof.

22. The process of claim 1 wherein the high-pressure separator of (e) is a gravimetric separation vessel.

23. The process of claim 1 wherein the monomer-rich phase of (f) comprises less than about 0.2 wt % of low molecular weight polymer, oligomer or combinations thereof.

24. The process of claim 1 wherein the monomer-rich phase of (f) has a density of about 0.3 to about 0.6 grams/mL.

25. The process of claim 1 wherein the polymer-rich blend phase of (f) has a density of about 0.5 to about 0.8 grams/mL.

26. The process of claim 1 wherein in (f), the pressure is dropped at a rate of at least about 6 MPa/sec.

27. The process of claims 15 or 21 wherein the one or more polymer additives are chosen from waxes, polyalfaolefins, antioxidants, plasticizers, nucleating and clarifying agents, slip agents, flame retardants, heat and UV stabilizers, antiblocking agents, fillers, reinforcing fibers, antistatic agents, lubricating agents, coloring agents, foaming agents, and combinations thereof.

28. The process of claim 1 wherein one or more of the reactor trains configured in parallel of (a) comprise a tubular reactor, a stirred autoclave reactor, a loop reactor, or combinations thereof.

29. The process of claim 1 wherein one or more of the reactor trains configured in parallel of (a) comprise two or more reactors in series wherein the two or more reactors in series comprise a tubular reactor followed by a stirred autoclave reactor or a tubular reactor followed by a loop reactor.

30. The process of claim 1 wherein the residence time is less than 60 minutes.

31. The process of claim 1 wherein the residence time is less than 20 minutes.

32. An in-line blending process for polymers comprising:

(a) providing two or more reactor trains configured in parallel and two or more high-pressure separators fluidly connected to the two or more reactor trains configured in parallel;

(b) contacting in the two or more reactor trains configured in parallel 1) olefin monomers having two or more carbon atoms 2) one or more catalyst systems, 3) optional one or more comonomers, 4) optional one or more scavengers, and 5) optional one or more inert diluents or inert solvents,

wherein the polymerization system for at least one of the reactor trains configured in parallel is at a temperature above the solid-fluid phase transition temperature, at a pressure no lower than 10 MPa below the cloud point pressure and less than 1500 MPa, is in its dense fluid state, and is above its critical temperature and critical pressure,

wherein at least one of the reactor trains includes an olefin monomer that has three or more carbon atoms,

wherein the polymerization system for each reactor train comprises the olefin monomers, any comonomer present, any inert diluent or inert solvent present, any scavenger present, and the polymer product,

wherein the catalyst system for each reactor train comprises one or more catalyst precursors, one or more activators, and optionally, one or more catalyst supports;

wherein the one or more catalyst systems are chosen from Ziegler Natta catalysts, metallocene catalysts, nonmetallocene metal-centered, heteroaryl ligand catalysts, late transition metal catalysts, and combinations thereof;

(c) forming an unreduced reactor effluent including a homogenous fluid phase polymer-monomer mixture in each parallel reactor train;

(d) passing the unreduced reactor effluents from one or more but not from all of the parallel reactor trains through one or more high-pressure separators, maintaining the temperature and pressure within the one or more high-pressure separators above the solid-fluid phase transition point but below the cloud point pressure and temperature to form one or more fluid-fluid two-phase systems with each two-phase system comprising a polymer-enriched phase and a monomer-rich phase, and separating the monomer-rich phase from the polymer-enriched phase in each of the one or more high-pressure separators to form one or more separated monomer-rich phases and one or more polymer-enriched phases;

(e) combining the one or more polymer-enriched phases from the one or more high-pressure separators of (d) with the one or more unreduced reactor effluents from one or more parallel reactor trains to form a mixture of one or more polymer-enriched phases and the one or more unreduced reactor effluents from the one or more parallel reactor trains to form a combined effluent stream that comprises the polymeric blend components from all parallel reactor trains;

(f) passing the combined effluent stream of (e) into another high-pressure separator for product blending and product-feed separation;

(g) maintaining the temperature and pressure within the another high pressure separator of (f) above the solid-fluid phase transition point but below the cloud point pressure and temperature to form a fluid-fluid two-phase system comprising a polymer-rich blend phase and a monomer-rich phase; and

(h) separating the monomer-rich phase from the polymer-rich blend phase to form a polymer blend and a separated monomer-rich phase.

33. The process of claim 32 wherein in (b) the polymerization system for the at least one of the reactor trains configured in parallel comprises less than 40 wt % of optional one or more inert solvents.

34. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa.

35. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa and comprise less than 40 wt % of optional one or more inert solvents.

36. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa and are above their critical temperatures and critical pressures.

37. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa, comprise less than 40 wt % of optional one or more inert solvents, and are above their critical temperatures and critical pressures.

38. The process of claim 32 wherein the two or more reactor trains configured in parallel of (b) includes one or more reactor trains operating at a temperature below the solid-fluid phase transition temperature of the polymerization system forming solid polymer particles and the polymerization system comprises less than 40 wt % of optional one or more inert solvents.

39. The process of claim 32 wherein the olefin monomers having three or more carbon atoms of (b) comprise propylene.

40. The process of claim 32 wherein the optional one or more comonomers of (b) comprise one or more of ethylenes, propylenes, butenes, hexenes, octenes, decenes, or dodecenes.

41. The process of claim 32 further comprising recycling the separated monomer-rich phases of (d) and (h) to the polymerization systems of the two or more reactor trains configured in parallel.

42. The process of claim 32 further comprising removing low-molecular weight oligomers, low molecular weight polymers or combinations thereof from the separated monomer-rich phases.

43. The process of claim 42 wherein the low-molecular weight oligomers, low molecular weight polymers or combinations thereof are removed through the use of at least one knock-out pot.

44. The process of claim 32 further comprising feeding the combined effluent stream of (e) through a static mixer between (e) and (f).

45. The process of claim 32 further comprising feeding a catalyst killer to one or more of the reactor effluents from one or more parallel reactor trains of (c).

46. The process of claim 32 further comprising providing one or more storage tanks, and feeding from the one or more storage tanks one or more polymers and/or polymer additives to the process after (c).

47. The process of claim 32 further comprising a pressure letdown valve for each reactor train configured in parallel positioned before the two or more high-pressure separators.

48. The process of claim 32 further comprising feeding the polymer-rich phase from one or more of the high-pressure separators to one or more low-pressure separators to further separate the monomers and other volatiles.

49. The process of 32 further comprising feeding the polymer blend of (h) to a coupled devolatizer to further separate other volatiles from the polymer blend to form a polymer product blend.

50. The process of claim 49 wherein the coupled devolatilizer operates under vacuum enabling the polymer product blend to flash off the monomers and other volatiles.

51. The process of claim 50 wherein the coupled devolatilizer is a devolatizing extruder.

52. The process of claim 51 wherein one or more polymer additives are added to the polymer product blend at one or more high-pressure separators, one or more low-pressure separators, the devolatizing extruder or combinations thereof.

53. The process of claim 32 wherein one or more of the high-pressure separators of (d) are gravimetric separation vessels.

54. The process of claim 32 wherein the monomer-rich phases of (d) and (g) comprise less than about 0.2 wt. % low molecular weight polymer, oligomer or combinations thereof.

55. The process of claim 32 wherein the monomer-rich phases of (d) and (g) have a density of about 0.3 to about 0.6 grams/mL.

56. The process of claim 32 wherein the polymer-rich blend phase of (g) has a density of about 0.5 to about 0.8 grams/ml.

57. The process of claim 32 wherein in (g), the pressure is dropped at a rate of at least about 6 MPa/sec.

58. The process of claims 46 or 52 wherein the one or more polymer additives are chosen from waxes, polyalfaolefins, antioxidants, plasticizers, nucleating and clarifying agents, slip agents, flame retardants, heat and UV stabilizers, antiblocking agents, fillers, reinforcing fibers, antistatic agents, lubricating agents, coloring agents, foaming agents, and combinations thereof.

59. The process of claim 32 wherein one or more of the reactor trains configured in parallel of (a) comprise a tubular reactor, a stirred autoclave reactor, a loop reactor, or combinations thereof.

60. The process of claim 32 wherein one or more of the reactor trains configured in parallel of (a) comprise two or more reactors in series, wherein the two or more reactors in series comprise a tubular reactor followed by a stirred autoclave reactor or a tubular reactor followed by a loop reactor.

61. The process of claim 32 wherein the residence time is less than 60 minutes.

CLAIMS

1. An in-line blending process for polymers comprising:

(a) providing two or more reactor trains configured in parallel and a high- pressure separator downstream fluidly connected to the two or more reactor trains configured in parallel;

(b) contacting in the two or more reactor trains configured in parallel 1) olefin monomers having two or more carbon atoms 2) one or more catalyst systems, 3) optional one or more comonomers, 4) optional one or more scavengers, and 5) optional one or more inert diluents or inert solvents,

wherein the polymerization system for at least one of the reactor trains configured in parallel is at a temperature above the solid-fluid phase transition temperature, at a pressure no lower than 10 MPa below the cloud point pressure and less than 1500 MPa, is in its dense fluid state, and is above its critical temperature and critical pressure,

wherein at least one of the reactor trains includes an olefin monomer that has three or more carbon atoms,

wherein the polymerization system for each reactor train comprises the olefin monomers, any comonomer present, any inert diluent or inert solvent present, any scavenger present, and the polymer product,

wherein the catalyst system for each reactor train comprises one or more catalyst precursors, one or more activators, and optionally, one or more catalyst supports;

wherein the one or more catalyst systems are chosen from Ziegler Natta catalysts, metallocene catalysts, nonmetallocene metal-centered, heteroaryl ligand catalysts, Group 3-10 transitional metal catalysts, and combinations thereof;

(c) forming a reactor effluent including a homogeneous fluid phase polymer-monomer mixture in each parallel reactor train;

(d) combining the reactor effluent comprising the homogeneous fluid phase polymer-monomer mixture from each parallel reactor train to form a combined reactor effluent;

(e) passing the combined reactor effluent through the high-pressure separator for product blending and product-feed separation;

(f) maintaining the temperature and pressure within the high-pressure separator above the solid-fluid phase transition point but below the cloud point pressure and temperature to form a fluid-fluid two-phase system comprising a polymer-rich blend phase and a monomer-rich phase; and

(g) separating the monomer-rich phase from the polymer-rich blend phase to form a polymer blend and a separated monomer-rich phase.

2. The process of claim 1 wherein in (b) the polymerization system for the at least one of the reactor trains configured in parallel comprises less than 40 wt % of optional one or more inert solvents.

3. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa.

4. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa, and comprise less than 40 wt % of optional one or more inert solvents.

5. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa, and are above their critical temperatures and critical pressures.

6. The process of claim 1 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and

less than 1500 MPa, comprise less than 40 wt % of optional one or more inert solvents, and are above their critical temperatures and critical pressures.

7. The process of claim 1 wherein the two or more reactor trains configured in parallel of (b) includes one or more reactor trains operating at a temperature below the solid-fluid phase transition temperature of the polymerization system forming solid polymer particles and the polymerization system comprises less than 40 wt % of optional one or more inert solvents.

8. The process of claim 1 wherein the olefin monomers having three or more carbon atoms of (b) comprise propylene.

9. The process of claim 1 wherein the optional one or more comonomers of (b) comprise one or more of ethylene, propylene, butenes, hexenes, octenes, decenes, or dodecenes.

10. The process of claim 1 further comprising recycling the separated monomer-rich phase to the polymerization systems of the two or more reactor trains configured in parallel.

11. The process of claim 10 further comprising removing low molecular weight oligomers, low molecular weight polymers or combinations thereof from the separated monomer-rich phase.

12. The process of claim 11 wherein the low molecular weight oligomers, low molecular weight polymers or combinations thereof are removed through the use of at least one knock-out pot.

13. The process of claim 1 further comprising feeding the combined reactor effluent of (d) through a static mixer between (d) and (e).

14. The process of claim 1 further comprising feeding a catalyst killer to one or more of the reactor effluents from one or more parallel reactor trains of (c).

15. The process of claim 1 further comprising providing one or more storage tanks, and feeding from the one or more storage tanks one or more polymers and/or polymer additives to the process after (c).

16. The process of claim 1 further comprising a pressure letdown valve for each reactor train configured in parallel positioned before the high-pressure separator.

17. The process of claim 1 further comprising feeding the polymer-rich phase of the high-pressure separator containing the polymer blend to one or more low-pressure separators to further separate the monomers and other volatiles from the polymer blend to form a further-enriched polymer blend.

18. The process of claim 17 further comprising feeding the further-enriched polymer blend to a coupled devolatizer to further separate other volatiles from the further-enriched polymer blend to form a polymer product blend.

19. The process of claim 18 wherein the coupled devolatilizer operates under vacuum enabling the further-enriched polymer blend to flash off the monomers and other volatiles.

20. The process of claim 19 wherein the coupled devolatilizer is a devolatizing extruder.

21. The process of claim 20 wherein one or more polymer additives are added to the polymer product blend at the high-pressure separator, the low-pressure separator, the devolatizing extruder or combinations thereof.

22. The process of claim 1 wherein the high-pressure separator of (e) is a gravimetric separation vessel.

23. The process of claim 1 wherein the monomer-rich phase of (f) comprises less than about 0.2 wt % of low molecular weight polymer, oligomer or combinations thereof.

24. The process of claim 1 wherein the monomer-rich phase of (f) has a density of about 0.3 to about 0.6 grams/mL.

25. The process of claim 1 wherein the polymer-rich blend phase of (f) has a density of about 0.5 to about 0.8 grams/mL.

26. The process of claim 1 wherein in (f), the pressure is dropped at a rate of at least about 6 MPa/sec.

27. The process of claims 15 or 21 wherein the one or more polymer additives are chosen from waxes, polyalfaolefins, antioxidants, plasticizers, nucleating and clarifying agents, slip agents, flame retardants, heat and UV stabilizers, antiblocking agents, fillers, reinforcing fibers, antistatic agents, lubricating agents, coloring agents, foaming agents, and combinations thereof.

28. The process of claim 1 wherein one or more of the reactor trains configured in parallel of (a) comprise a tubular reactor, a stirred autoclave reactor, a loop reactor, or combinations thereof.

29. The process of claim 1 wherein one or more of the reactor trains configured in parallel of (a) comprise two or more reactors in series wherein the two or more reactors in series comprise a tubular reactor followed by a stirred autoclave reactor or a tubular reactor followed by a loop reactor.

30. The process of claim 1 wherein the reactor residence time is less than 60 minutes.

31. The process of claim 1 wherein the reactor residence time is less than 20 minutes.

32. An in-line blending process for polymers comprising:

(a) providing two or more reactor trains configured in parallel and two or more high-pressure separators fluidly connected to the two or more reactor trains configured in parallel;

(b) contacting in the two or more reactor trains configured in parallel 1) olefin monomers having two or more carbon atoms 2) one or more catalyst systems, 3) optional one or more comonomers, 4) optional one or more scavengers, and 5) optional one or more inert diluents or inert solvents,

wherein the polymerization system for at least one of the reactor trains configured in parallel is at a temperature above the solid-fluid phase transition temperature, at a pressure no

lower than 10 MPa below the cloud point pressure and less than 1500 MPa, is in its dense fluid state, and is above its critical temperature and critical pressure,

wherein at least one of the reactor trains includes an olefin monomer that has three or more carbon atoms,

wherein the polymerization system for each reactor train comprises the olefin monomers, any comonomer present, any inert diluent or inert solvent present, any scavenger present, and the polymer product,

wherein the catalyst system for each reactor train comprises one or more catalyst precursors, one or more activators, and optionally, one or more catalyst supports;

wherein the one or more catalyst systems are chosen from Ziegler Natta catalysts, metallocene catalysts, nonmetallocene metal-centered, heteroaryl ligand catalysts,Group 3-10 transition metal catalysts, and combinations thereof;

(c) forming an unreduced reactor effluent including a homogenous fluid phase polymer-monomer mixture in each parallel reactor train;

(d) passing the unreduced reactor effluents from one or more but not from all of the parallel reactor trains through one or more high-pressure separators, maintaining the temperature and pressure within the one or more high-pressure separators above the solid-fluid phase transition point but below the cloud point pressure and temperature to form one or more fluid-fluid two-phase systems with each two-phase system comprising a polymer-enriched phase and a monomer-rich phase, and separating the monomer-rich phase from the polymer-enriched phase in each of the one or more high-pressure separators to form one or more separated monomer-rich phases and one or more polymer-enriched phases;

(e) combining the one or more polymer-enriched phases from the one or more high-pressure separators of (d) with the one or more unreduced reactor effluents from one or more parallel reactor trains to form a mixture of one or more polymer-enriched phases and the one or more unreduced reactor effluents from the one or more parallel reactor trains to form a combined effluent stream that comprises the polymeric blend components from all parallel reactor trains;

(f) passing the combined effluent stream of (e) into another high-pressure separator for product blending and product-feed separation;

(g) maintaining the temperature and pressure within the another high pressure separator of (f) above the solid-fluid phase transition point but below the cloud point pressure and temperature to form a fluid-fluid two-phase system comprising a polymer-rich blend phase and a monomer-rich phase; and

(h) separating the monomer-rich phase from the polymer-rich blend phase to form a polymer blend and a separated monomer-rich phase.

33. The process of claim 32 wherein in (b) the polymerization system for the at least one of the reactor trains configured in parallel comprises less than 40 wt % of optional one or more inert solvents.

34. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa.

35. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa and comprise less than 40 wt % of optional one or more inert solvents.

36. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and less than 1500 MPa and are above their critical temperatures and critical pressures.

37. The process of claim 32 wherein in (b) the polymerization systems for the two or more reactor trains configured in parallel are at temperatures above the solid-fluid phase transition temperatures and pressures no lower than 10 MPa below the cloud point pressures and

less than 1500 MPa, comprise less than 40 wt % of optional one or more inert solvents, and are above their critical temperatures and critical pressures.

38. The process of claim 32 wherein the two or more reactor trains configured in parallel of (b) includes one or more reactor trains operating at a temperature below the solid-fluid phase transition temperature of the polymerization system forming solid polymer particles and the polymerization system comprises less than 40 wt % of optional one or more inert solvents.

39. The process of claim 32 wherein the olefin monomers having three or more carbon atoms of (b) comprise propylene.

40. The process of claim 32 wherein the optional one or more comonomers of (b) comprise one or more of ethylenes, propylenes, butenes, hexenes, octenes, decenes, or dodecenes.

41. The process of claim 32 further comprising recycling the separated monomer-rich phases of (d) and (h) to the polymerization systems of the two or more reactor trains configured in parallel.

42. The process of claim 32 further comprising removing low-molecular weight oligomers, low molecular weight polymers or combinations thereof from the separated monomer-rich phases.

43. The process of claim 42 wherein the low-molecular weight oligomers, low molecular weight polymers or combinations thereof are removed through the use of at least one knock-out pot.

44. The process of claim 32 further comprising feeding the combined effluent stream of (e) through a static mixer between (e) and (f).

45. The process of claim 32 further comprising feeding a catalyst killer to one or more of the reactor effluents from one or more parallel reactor trains of (c).

46. The process of claim 32 further comprising providing one or more storage tanks, and feeding from the one or more storage tanks one or more polymers and/or polymer additives to the process after (c).

47. The process of claim 32 further comprising a pressure letdown valve for each reactor train configured in parallel positioned before the two or more high-pressure separators.

48. The process of claim 32 further comprising feeding the polymer-rich phase from one or more of the high-pressure separators to one or more low-pressure separators to further separate the monomers and other volatiles.

49. The process of 32 further comprising feeding the polymer blend of (h) to a coupled devolatizer to further separate other volatiles from the polymer blend to form a polymer product blend.

50. The process of claim 49 wherein the coupled devolatilizer operates under vacuum enabling the polymer product blend to flash off the monomers and other volatiles.

51. The process of claim 50 wherein the coupled devolatilizer is a devolatizing extruder.

52. The process of claim 51 wherein one or more polymer additives are added to the polymer product blend at one or more high-pressure separators, one or more low-pressure separators, the devolatizing extruder or combinations thereof.

53. The process of claim 32 wherein one or more of the high-pressure separators of (d) are gravimetric separation vessels.

54. The process of claim 32 wherein the monomer-rich phases of (d) and (g) comprise less than about 0.2 wt. % low molecular weight polymer, oligomer or combinations thereof.

55. The process of claim 32 wherein the monomer-rich phases of (d) and (g) have a density of about 0.3 to about 0.6 grams/mL.

56. The process of claim 32 wherein the polymer-rich blend phase of (g) has a density of about 0.5 to about 0.8 grams/ml.

57. The process of claim 32 wherein in (g), the pressure is dropped at a rate of at least about 6 MPa/sec.

58. The process of claims 46 or 52 wherein the one or more polymer additives are chosen from waxes, polyalfaolefins, antioxidants, plasticizers, nucleating and clarifying agents, slip agents, flame retardants, heat and UV stabilizers, antiblocking agents, fillers, reinforcing fibers, antistatic agents, lubricating agents, coloring agents, foaming agents, and combinations thereof.

59. The process of claim 32 wherein one or more of the reactor trains configured in parallel of (a) comprise a tubular reactor, a stirred autoclave reactor, a loop reactor, or combinations thereof.

60. The process of claim 32 wherein one or more of the reactor trains configured in parallel of (a) comprise two or more reactors in series, wherein the two or more reactors in series comprise a tubular reactor followed by a stirred autoclave reactor or a tubular reactor followed by a loop reactor.

61. The process of claim 32 wherein the reactor residence time is less than 60 minutes.

62. The process of claim 32 wherein the reactor residence time is less than 20 minutes.