

CLAIMS

1. A process comprising:
passing a homogeneous single-site catalyst to a solution polymerization reactor in the form of a suspension in an aliphatic hydrocarbon, oil, or wax;
contacting the catalyst with one or more α -olefin monomers; and
recovering a polyolefin;
wherein the concentration of the homogeneous single-site catalyst is greater than 0.8 mmole/liter if suspended in an aliphatic hydrocarbon solvent, and greater than 0.2 mmole/liter if suspended in an oil or a wax.
2. A polymerization process comprising:
passing a homogeneous single-site catalyst into a catalyst feed line of a solution phase polymerization reactor wherein the catalyst is suspended in an aliphatic hydrocarbon solvent, or an oil or a wax; and
contacting the homogeneous single-site catalyst and one or more α -olefin monomers;
recovering a polyolefin;
wherein the homogeneous single-site catalyst in the catalyst feed line is at a concentration greater than 0.8 mmole/liter when suspended in the aliphatic hydrocarbon solvent, and greater than 0.2 mmole/liter when suspended in the oil or wax.
3. The process of claim 2, wherein a carrier solvent or gas is passed into the catalyst feed line.
4. The process of any one of the previous claims, further comprising passing an activator into the reactor, wherein the activator is also suspended in an aliphatic hydrocarbon solvent, or an oil or a wax.
5. The process of claim 4, wherein the activator suspended in the aliphatic hydrocarbon solvent is at a concentration within a range from 0.8 mmole/liter to 80 mmole/liter in the aliphatic hydrocarbon solvent.
6. The process of claim 4, wherein the activator suspended in the aliphatic hydrocarbon is at a concentration within a range from 0.2 mmole/liter to 80 mmole/liter in the oil or wax.

7. The process of any one of the previous claims, wherein the homogeneous single-site catalyst suspended in the aliphatic hydrocarbon solvent is at a concentration within a range from 0.8 mmole/liter to 80 mmole/liter in the aliphatic hydrocarbon solvent.
8. The process of any one of the previous claims, wherein the homogeneous single-site catalyst suspended in the oil or wax is at a concentration within a range from 0.2 mmole/liter to 80 mmole/liter in the oil or wax.
9. The process of any one of the previous claims, wherein the aliphatic hydrocarbon solvent, oil or wax is a C₄ to C₂₀₀ hydrocarbon.
10. The process of claim 9, wherein the homogeneous single-site catalyst is suspended in an oil, wherein the oil is a C₁₅ to C₂₀₀ hydrocarbon.
11. The process of claim 9, wherein the homogeneous single-site catalyst is suspended in an aliphatic hydrocarbon solvent, wherein the aliphatic hydrocarbon solvent is a C₄ to C₁₄ aliphatic hydrocarbon solvent.
12. The process of claim 11, wherein the aliphatic hydrocarbon solvent is selected from the group consisting of isobutane, propane, n-pentane, i-pentane, neopentane and n-hexane, isohexane, n-heptane, and combinations thereof.
13. The process of any one of the previous claims, wherein the homogeneous single-site catalyst is a C₂ symmetric bis-cyclopentadienyl metallocene, or a C_s symmetric bis-cyclopentadienyl metallocene.
14. The process of claim 13, wherein the homogeneous single-site catalyst is a Group 3 to 6 metallocene having ligands consisting of one to two cyclopentadienyl radicals and radicals isolobal to cyclopentadienyl, the cyclopentadienyl selected from the group consisting of the cyclopentaphenanthrenyl, indenyl, benzindenyl, fluorenyl, octahydrofluorenyl, cyclooctatetraenyl, cyclopentacyclododecene, phenanthrindenyl, 3,4-benzofluorenyl, 9-phenylfluorenyl, 8-H-cyclopent[a]acenaphthylenyl, 7-H-dibenzofluorenyl, indeno[1,2-

9]anthrene, thiophenoindenyl, thiophenofluorenyl, hydrogenated versions thereof, substituted versions thereof, and heterocyclic versions thereof.

15. The process of any one of the previous claims, wherein the homogeneous single-site catalyst is alkylated.

16. The process of any one of the previous claims, comprising contacting the homogeneous single-site catalyst and α -olefin monomers at a temperature greater than 50°C.

17. The process of any one of the previous claims, wherein the α -olefin monomers are selected from the group consisting of ethylene, propylene, and combinations thereof.

18. The process of any one of the previous claims, wherein the polyolefin is free of aromatic hydrocarbon.

19. Use of an oil or wax suspension to deliver a homogeneous single-site catalyst to a solution polymerization process.

20. Use of an aliphatic hydrocarbon solvent suspension to deliver a homogeneous single-site catalyst to a solution polymerization process.

21. A process comprising:
passing a homogeneous single-site catalyst to a solution polymerization reactor in the form of a dry powder;
contacting the catalyst with one or more α -olefin monomers; and
recovering a polyolefin.

22. The process of claim 21, wherein the homogeneous single-site catalyst is first passed to a catalyst feed line fluidly connected to the polymerization reactor.

23. The process of claims 21 or 22, wherein the homogeneous single-site catalyst and α -olefin monomers are combined at a temperature greater than 50°C.

24. The process of any one of claims 21 to 23, wherein the polyolefin is free of aromatic hydrocarbon.
25. The process of any one of claims 21 to 24, wherein the α -olefin monomers are selected from the group consisting of ethylene, propylene, and combinations thereof.
26. The process of any one of claims 21 to 25, wherein the homogeneous single-site catalyst is alkylated.