CLAIMS

1. A method of preventing formation of solids in a hydrogenation catalyst comprising the steps of:

(a) mixing a solid hydrogenation catalyst precursor with a solvent, and optionally with an activator, to form a solvent solution; followed by

(b) combining a C3 to C12 α-olefin with the solvent solution to form a hydrogenation catalyst solution,

wherein the C3 to C12 α-olefin excludes 1-octene.

2. The method of claim 1, wherein the hydrogenation catalyst solution is substantially clear by visual inspection.

3. The method of claim 1, wherein the solid hydrogenation catalyst precursor is a titanocene.

4. The method of claim 3, wherein the C3 to C12 α-olefin is combined with the solvent solution at a pressure of at least 20 psig.

5. The method of claim 1, wherein the activator comprises an alkylaluminum.

6. The method of claim 1, followed by contacting at least a portion of the hydrogenation catalyst solution with a first polymerization medium containing hydrogen (H_2) to produce a second polymerization medium, wherein the second polymerization medium comprises less hydrogen than the first polymerization medium.

7. The method of claim 1, wherein the hydrogenation catalyst solution is added to a reactor in the presence of a polymerization catalyst.

8. The method of claim 1, wherein the solvent is a C3 to C10 alkane.

9. The method of claim 1, wherein the solvent is hexane.

10. A method of producing a hydrogenation catalyst solution comprising the steps:

(a) mixing titanocene dichloride with triethylaluminum in a solvent to form a solvent solution;

(b) adding propylene under pressure of at least 20 psig to the solvent solution; and

(c) combining the solvent solution with a Ziegler-Natta catalyst to provide the hydrogenation catalyst solution useful in the production of polymers.

11. The method of claim 10, wherein the hydrogenation catalyst solution is stored at least 99 days without formation of visible solids.

12. The method of claim 10, wherein the hydrogenation catalyst solution is maintained under pressure of at least 20 psig to prevent formation of solids.

13. The method of claim 10, wherein the solvent is a C3 to C10 alkane.

14. The method of claim 1, wherein the C3 to C12 α-olefin is combined with the solvent solution after a time sufficient for an activated hydrogenation catalyst to form solids in the solvent solution, and the C3 to C12 α-olefin reverses formation of the solids.

15. The method of claim 1, wherein the hydrogenation catalyst solution is stored at least 99 days without formation of visible solids.

16. The method of claim 1, wherein the solvent solution comprises at least 20 weight percent (wt. %) dissolved activated hydrogenation catalyst.