What is claimed is:

1. A supported chromium catalyst comprising a chromium (VI) distribution of from about two chromium (VI) atoms to about 4 chromium (VI) atoms per nm^2 of catalyst wherein the support has a surface area of less than about 250 m^2/g.

2. The supported chromium catalyst of claim 1 wherein the support comprises silica, alumina, aluminophosphates, or mixtures thereof.

3. The supported chromium catalyst of claim 1 wherein the support comprises a precipitated silica or a gelled silica.

4. The supported chromium catalyst of claim 1 wherein the support comprises a reinforced support.

5. The supported chromium catalyst of claim 4 wherein the reinforced support comprises (i) an alkaline aged support, (ii) a neutral aged support, (iii) a thermally-sintered support, (iv) a chemically-sintered support, (v) a support treated by secondary deposition, (vi) a hydrothermally-treated support, or (vii) combinations thereof.

6. The supported chromium catalyst of claim 1 wherein chromium is present in an amount of from about 0.01 wt. % to about 10 wt. % based on the total weight of the catalyst.

7. The supported chromium catalyst of claim 1 further comprising titanium.

8. The supported chromium catalyst of claim 7 wherein titanium is present in an amount of from about 0.1 wt. % to about 10 wt. % by total weight of the catalyst.

9. The supported chromium catalyst of claim 1 wherein the support has a pore volume of from about 0.5 cc/g to about 3.5 cc/g.

10. The supported chromium catalyst of claim 1 having a catalytic activity of greater than about 750 grams polymer product per gram catalyst used.

11. The supported chromium catalyst of claim 1 effective to polymerize a polymer having a long chain branching content peaking at greater than about 20 long chain branches per million carbon atoms, and a polydispersity index (M_w/M_n) of greater than about 10 wherein the long chain branching decreases to approximately zero at the higher molecular weight portion of the molecular weight distribution.

12. The supported chromium catalyst of claim 1 effective to polymerize a polymer having a long chain branching content peaking at greater than about 8 long chain branches per million carbon atoms, a polydispersity index (M_w/M_n) of greater than about 20 wherein the long chain branching decreases to approximately zero at the higher molecular weight portion of the molecular weight distribution.

13. The supported chromium catalyst of claim 1 effective to polymerize a polymer having a long chain branching content peaking at greater than about 1 long chain branches per chain,

and a polydispersity index (M_w/M_n) of greater than about 10 wherein the long chain branching decreases to approximately zero at the higher molecular weight portion of the molecular weight distribution.

14. The supported chromium catalyst of claim 1 comprising a chromium (VI) distribution of from about two chromium (VI) atoms to about 3.5 chromium (VI) atoms per nm^2 of catalyst.

15. The supported chromium catalyst of claim 1 comprising a chromium (VI) distribution of from about two chromium (VI) atoms to about 3 chromium (VI) atoms per nm^2 of catalyst.

16. A method comprising:

contacting a chromium-containing compound, a support, and a titanium-containing compound to form a catalyst precursor; and

thermally-treating the catalyst precursor at temperature equal to or less than about 650° C. to form a polymerization catalyst,

wherein the catalyst has a chromium (VI) distribution of from about two chromium (VI) atoms to about 4 chromium (VI) atoms per nm^2 of catalyst wherein the support has a surface area of less than about 250 m^2/g.

17. The method of claim 16 wherein the support comprises a precipitated silica, a gelled silica, or combinations thereof.

18. The method of claim 16 wherein the support is a reinforced support.

19. The method of claim 18 wherein the reinforced support comprises (i) an alkaline aged support, (ii) a neutral aged support, (iii) a thermally-sintered support, (iv) a chemically-sintered support, (v) a support treated by secondary deposition, (vi) a hydrothermally-treated support, or (vii) combinations thereof.

20. The method of claim 16 wherein the support has a pore volume of from about 0.5 cc/g to about 3.5 cc/g.

21. The method of claim 16 wherein the titanium-containing compound comprises titanyl nitrate, $TiCl_3$, $(Ti)_2(SO_4)_3$, $Ti(OH)Cl_2$, $TiBr_3$, or combinations thereof.

22. The method of claim 16 wherein titanium is present in an amount of from about 0.1 wt. % to about 10 wt. % based on the total weight of the polymerization catalyst.

23. The method of claim 16 further comprising drying the precursor catalyst at a temperature range of from about 25° C. to about 300° C.

24. The method of claim 16 wherein chromium is present in an amount of from about 0.01 wt. % to about 10 wt. % based on the total weight of the polymerization catalyst.

25. The method of claim 16 further comprising contacting the polymerization catalyst with a cocatalyst comprising organoaluminum compounds, organoboron compounds, organolithium compounds, or mixtures thereof to form a catalyst composition.

26. The method of claim 25 further comprising contacting the catalyst composition with ethylene and recovering polyethylene.

27. The method of claim 16 wherein the catalyst has a chromium (VI) distribution of from about two chromium (VI) atoms to about 3.5 chromium (VI) atoms per nm^2 of catalyst.

28. The method of claim 16 wherein the catalyst has a chromium (VI) distribution of from about two chromium (VI) atoms to about 3 chromium (VI) atoms per nm^2 of catalyst.