CLAIMS

What is claimed is:

1. 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.
2. The polymer of claim 1 wherein polymer comprises polyethylene.
3. The polymer of claim 1 wherein the polymer displays a molecular weight distribution of greater than about 15.
4. The polymer of claim 1 wherein the long-chain branching content peaks at greater than about 1.0 long-chain branches per chain.
5. The polymer of claim 1 wherein the long-chain branching content peaks at about 25 long chain branches per million carbon atoms
6. The polymer of claim 1 wherein the long-chain branching content peaks at about 30 long chain branches per million carbon atoms
7. The polymer of claim 1 having a melt index of from about 0 dg/min to about 100 dg/min.
8. The polymer of claim 1 having a density of from about 0.90 g/cc to about 0.97 g/cc.
9. A polymer having a long chain branching content peaking at greater than about 8 long chain branches per million carbon atoms, a polydispersity index 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.
10. The polymer of claim 9 wherein the long-chain branching content peaks at about 20 long chain branches per million carbon atoms
11. The polymer of claim 9 wherein the long-chain branching content peaks at greater than about 1.0 long-chain branches per chain.
12. The polymer of claim 9 wherein polymer comprises polyethylene.
13. A polymer having a long chain branching content peaking at greater than about 1 long chain branches per chain, and a polydispersity index 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 polymer of claim 13 wherein the long-chain branching content peaks at greater than about 1.3 long-chain branches per chain and the molecular weight distribution is greater than about 20.
15. The polymer of claim 13 wherein the long-chain branching content peaks at greater than about 1.5 long-chain branches per chain and the molecular weight distribution is greater than about 20.
16. The polymer of claim 13 wherein the polymer comprises polyethylene.
17. A method of polymerizing a monomer comprising contacting the monomer with a chromium-supported catalyst under conditions suitable for the formation of a polymer; and recovering the polymer wherein the chromium supported catalyst comprises a silica support having a surface area of less than about 200 m^2/g and wherein the polymer has a long chain branching content peaking at greater than about 20 long chain branches per million carbon atoms.
18. The method of claim 17 wherein conditions suitable for formation of a polymer further comprises a cocatalyst.
19. The method of claim 17 wherein the chromium-supported catalyst further comprises titanium.
20. The method of claim 17 wherein the monomer comprises ethylene and the polymer comprises polyethylene.

CLAIMS

What is claimed is:

1. A polymer of C_2-C_8 monoolefin monomers having a polydispersity index of greater than about 20 and a long chain branching content peaking at greater than about 8 long chain branches per million carbon atoms, wherein the long chain branching decreases to approximately zero at the higher molecular weight portion of the molecular weight distribution.

2. The polymer of claim 1 wherein the polymer comprises polyethylene.

3. The polymer of claim 1 wherein the long-chain branching content peaks at about 20 long chain branches per million carbon atoms.

4. The polymer of claim 1 wherein the long-chain branching content peaks at about 25 long chain branches per million carbon atoms.

5. The polymer of claim 1 wherein the long-chain branching content peaks at about 30 long chain branches per million carbon atoms.

6. The polymer of claim 1 wherein the long-chain branching content peaks at greater than about 1.0 long-chain branches per chain.

7. The polymer of claim 1 wherein the long-chain branching content peaks at greater than about 1.3 long-chain branches per chain.

8. The polymer of claim 1 wherein the long-chain branching content peaks at greater than about 1.5 long-chain branches per chain.

9. The polymer of claim 1 having a melt index of from about 0 dg/min to about 100 dg/min.

10. The polymer of claim 1 having a density of from about 0.90 g/cc to about 0.97 g/cc.

11. A method of polymerizing C_2-C_8 monoolefin monomers comprising contacting the monomers with a chromium supported catalyst under conditions suitable for the formation of a polymer, and recovering the polymer;

wherein the chromium supported catalyst comprises a silica support having a surface area of less than about 200 m^2/g; and

wherein the polymer has a polydispersity index of greater than about 20 and a long chain branching content peaking at greater than about 8 long chain branches per million carbon atoms, wherein the long chain branching decreases to approximately zero at the higher molecular weight portion of the molecular weight distribution.

12. The method of claim 11 wherein conditions suitable for formation of a polymer further comprises a cocatalyst.

13. The method of claim 11 wherein the chromium-supported catalyst further comprises titanium.

14. The method of claim 11 wherein the monomer comprises ethylene and the polymer comprises polyethylene.