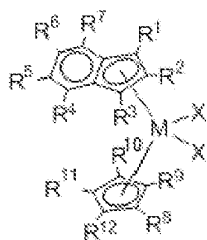


What is claimed:

1. A polymerization catalyst, the polymerization catalyst comprising a metallocene catalyst of Formula I:

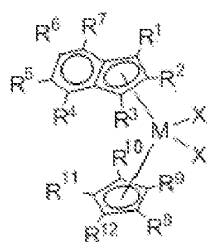


(Formula I)

wherein each of R^1 to R^{12} is independently a C_1 to C_{20} alkyl, aryl or aralkyl group, a hydrogen, wherein at least one of R^4 to R^7 is not a hydrogen, wherein M is a Group 4 metal, and wherein, each X is independently a halide, C_1 to C_{20} alkyl, aralkyl or hydrogen.

2. The polymerization catalyst of claim 1, wherein each of R^9 , R^{10} , R^{11} and R^{12} of Formula I is a hydrogen.
3. The polymerization catalyst of claim 1, wherein each of R^1 , R^2 , and R^3 of Formula I is a hydrogen.
4. The polymerization catalyst of claim 1, wherein R^5 and R^6 of Formula I together form a cycloalkyl group.
5. The polymerization catalyst of claim 4, wherein the cycloalkyl group further comprises cyclohexyl-1,1,4,4-tetramethyl.
6. The polymerization catalyst of claim 4, wherein the R^8 of Formula I is a C_1 to C_{20} alkyl.
7. The polymerization catalyst of claim 6, wherein R^8 of Formula I further comprises a C_1 to C_3 alkyl.

6. The polymerization catalyst of claim 1, wherein each of R^7 and R^4 of Formula I is independently a C_1 to C_{20} alkyl.
7. The polymerization catalyst of claim 6, wherein each of R^1, R^2, R^3 of Formula I is a hydrogen.
8. The polymerization catalyst of claim 6, wherein each of R^5 and R^6 of Formula I is a hydrogen.
9. The polymerization catalyst of claim 1, wherein M of Formula I further comprises titanium, zirconium or hafnium.
10. A polyethylene composition comprising polyethylene formed in a single reactor via a polymerization catalyst comprising a metallocene catalyst having improved ethylene enchainment of the formula:

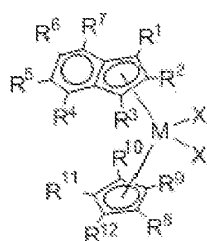


(Formula I)

wherein each of R^1 to R^{12} is independently a C_1 to C_{20} alkyl, aryl or aralkyl group, or a hydrogen, wherein at least one of R^4 to R^7 is not a hydrogen, wherein M is a Group 4 metal, and wherein, each X is independently a halide, C_1 to C_{20} alkyl, aralkyl or hydrogen.

11. The polyethylene composition of claim 10, wherein the polyethylene has a weight average molecular weight from 5,000 to 250,000 grams/mole (g/mol).

12. The polyethylene composition of claim 11, wherein the polyethylene having the improved ethylene enchainment has a melt temperature of from 90 degrees Celsius to 136134 degrees Celsius.
13. A method of producing polyethylene having improved ethylene enchainment, the method comprising:
- polymerizing ethylene in a reactor in presence of a polymerization catalyst to form the polyethylene, wherein the polymerization catalyst comprises a metallocene catalyst of Formula I:



(Formula I)

wherein each of R^1 to R^{12} is independently a C_1 to C_{20} alkyl, aryl or aralkyl group, or a hydrogen, wherein at least one of R^4 to R^7 is not a hydrogen, wherein M is a Group 4 metal, and wherein, each X is independently a halide, C_1 to C_{20} alkyl, aralkyl or hydrogen.