CLAIMS

What is claimed is:

1. A method of producing a polyethylene resin in a single reactor, the method comprising:

contacting ethylene, hydrogen and, optionally, one or more other olefins, with a catalyst system, wherein the catalyst system comprises two different catalyst compounds, and varying the in-reactor ratio of the two different catalyst compounds of the catalyst system between about 2.5 and about 1.8 on a molar basis and varying the ratio of hydrogen to ethylene to modify a polymerization reactor-modified weight swell of the polyethylene resin;

wherein the polyethylene resin comprises units derived from ethylene, and optionally one or more other olefins, wherein the resin has a density greater than or equal to about 0.945 g/cm^3, measured according to ASTM D792, a melt flow ratio (I_{21}/I_5) in the range from about 10 to about 60, measured according to ASTM D1238 (I_{21} and I_5 measured at 190°C and 21.6 kg or 5 kg weight respectively), and a flow index (I_{21}) in the range from about 2 to about 60.

2. The method of claim 1 wherein the catalyst system comprises at least one metallocene catalyst compound and/or at least one Group 15 and metal containing catalyst compound.

3. The method of claim 2 wherein the catalyst system comprises bis(cyclopentadienyl) zirconium X_2, wherein the cyclopentadienyl group may be substituted or unsubstituted, and at least one of a bis(arylamido) zirconium X_2 and a bis(cycloalkylamido) zirconium X_2, wherein X represents a leaving group.

4. The method of any one of claims 1 to 3, wherein the hydrogen to ethylene ratio is adjusted to within a range from about 0.0001 to about 0.01, on a molar basis.

5. The method of any one of claims 1 to 4 wherein the ratio of the at least one Group 15 metal containing component to metallocene component is adjusted within a range from about 0.5 to about 6.0, on a molar basis.