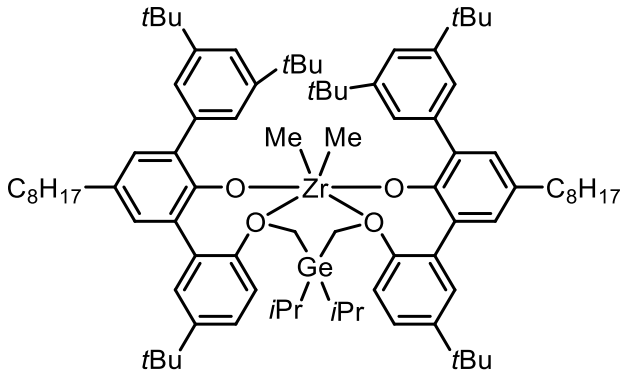
the octene isomers can build up to as much as 70% of the total recycle stream.

[0004] Hence, the art recognizes the on-going need for ways to utilize purge stream hydrocarbon species that avoids mere disposal of same. A need further exists for utilizing octene monomer that is present in the purge stream.

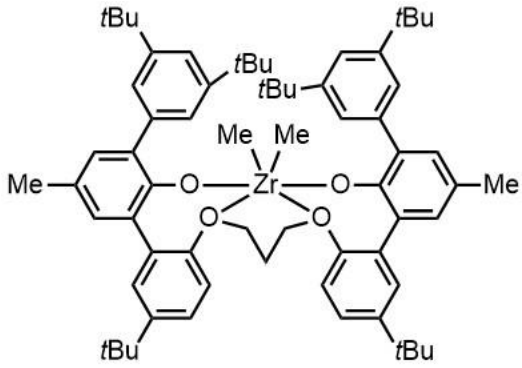
SUMMARY

[0005] The present disclosure provides a process. The process includes providing a purge stream containing octene monomer. The process includes contacting, under polymerization conditions, the purge stream with a bis-biphenylphenoxy catalyst, and forming an octene polymer having an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0.

[0005a] In an aspect, the present disclosure provides a process comprising: providing a purge stream comprising octene monomer; contacting, under polymerization conditions, the purge stream with a bis-biphenylphenoxy catalyst having a formula (V)



or having the formula (VI)



;

and forming an octene homopolymer having an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol as measured by Triple Detection Gas Permeation

Chromatography (TDGPC) and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0 as measured by TDGPC.

[0006] The present disclosure provides a composition. The composition includes an octene homopolymer and a solvent. The octene homopolymer has an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0.

[0006a] In another aspect, the present disclosure provides a composition comprising: an octene homopolymer having an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0 as measured by TDGPC; and a solvent, the octene homopolymer comprising a residual amount of zirconium in an amount of from greater than 0 ppm to less than 300 ppm.

BRIEF DESCRIPTION OF THE DRAWING

[0007] The Figure is a schematic representation of a polymerization system in accordance with an embodiment of the present disclosure.

DEFINITIONS

[0008] Any reference to the Periodic Table of Elements is that as published by CRC Press, Inc., 1990–1991. Reference to a group of elements in this table is by the new notation for numbering groups.

[0009] For purposes of United States patent practice, the contents of any referenced patent, patent application or publication are incorporated by reference in their entirety (or its equivalent US version is so incorporated by reference) especially with respect to the disclosure of definitions (to the extent not inconsistent with any definitions specifically provided in this disclosure) and general knowledge in the art.

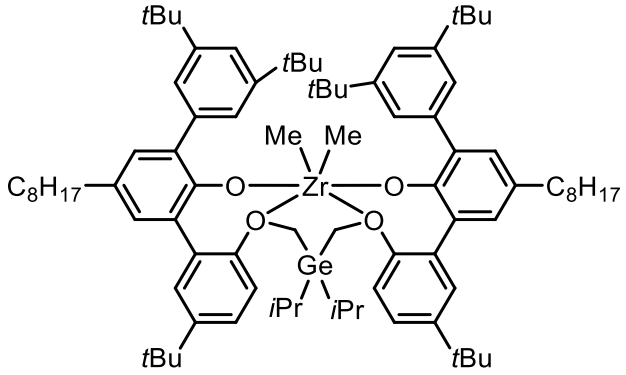
[0010] The numerical ranges disclosed herein include all values from, and including, the lower and upper value. For ranges containing explicit values (*e.g.*, 1 or 2, or 3 to 5, or 6, or 7), any subrange between any two explicit values is included (*e.g.*, the range 1-7 above includes

CLAIMS

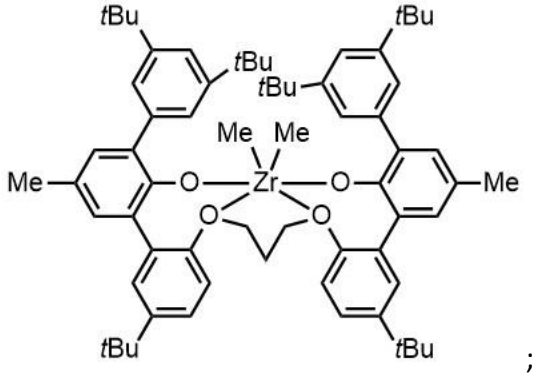
1. A process comprising:

providing a purge stream comprising octene monomer;

contacting, under polymerization conditions, the purge stream with a bis-biphenylphenoxy catalyst having a formula (V)



or having the formula (VI)



;

and

forming an octene homopolymer having an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol as measured by Triple Detection Gas Permeation Chromatography (TDGPC) and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0 as measured by TDGPC.

2. The process of claim 1 comprising

providing a purge stream composed of

from 20 wt% to 50 wt% 1-octene,

from 10 wt% to 50 wt% solvent, and

from 10 wt% to 70 wt% octene isomers.

3. The process of claim 1 or 2 comprising

removing, before the contacting, any ethylene present in the purge stream; and

providing a purge stream comprising 0 wt% ethylene.

4. A composition comprising:

an octene homopolymer having an absolute weight average molecular weight ($Mw_{(Abs)}$) greater than 1,300,000 g/mol and a $Mw_{(Abs)}$/ $Mn_{(Abs)}$ from 1.3 to 3.0 as measured by TDGPC; and

a solvent,

the octene homopolymer comprising a residual amount of zirconium in an amount of from greater than 0 ppm to less than 300 ppm.

5. The composition of claim 4 wherein the octene homopolymer comprises from 0 ppm to less than 10 ppm titanium.

6. The composition of claim 4 or 5 wherein the octene homopolymer comprises a residual amount of germanium in an amount of from greater than 0 ppm to less than 300 ppm.

7. The composition of any of claims 4-6 wherein the composition comprises

(i) from 10 wt% to 50 wt% octene homopolymer;

(ii) from 0 wt% to 70 wt% octene isomers;

(iii) from 90 wt% to 10 wt% of the solvent; and (i), (ii), (iii) amount to 100 wt% of the composition.

8. The composition of any of claims 4-7 comprising

from 80 wt% to 95 wt% of the octene homopolymer; and

from 20 wt% to 5 wt% of the solvent.

9. The composition of any of claims 4-8 wherein the composition comprises

(i) from 35 wt% to 45 wt% octene homopolymer;

(ii) from 65 wt % to 55 wt% solvent wherein (i) and (ii) amount to 100 wt% of the composition, and

the composition has a viscosity from $2.9014*10^{+05}$ m-Pas to $3.573*10^{+07}$ m-Pas.

10. The composition of any of claims 4-9 wherein the octene homopolymer comprises from

30 ppm to 160 ppm zirconium.

11. The composition of any of claims 6-10 wherein the octene homopolymer comprises from 14 ppm to 125 ppm germanium.