What is claimed is:

1. A process comprising:

contacting, under polymerization conditions, propylene and optionally one or more comonomers with a catalyst composition comprising a substituted phenylene aromatic diester; and

forming a wash-free propylene-based polymer with a total ash content less than 30 ppm.

2. The process of claim 1 comprising forming a wash-free propylene-based polymer with a property selected from the group consisting of from 0 ppm to 10 ppm aluminum, from 0 ppm to 10 ppm chlorine, from 0 ppm to 10 ppm magnesium, from 0 ppm to 10 ppm titanium, and combinations thereof.

3. The process of claim 1 comprising forming a propylene-based polymer having less than 6.0 wt% xylene solubles content.

4. The process of claim 1 comprising contacting propylene with a catalyst composition comprising a substituted phenylene aromatic diester that is 3-methyl-5-tert-butyl-1,2-phenylene dibenzoate; and forming a propylene homopolymer.

5. The process of claim 1 comprising contacting propylene and ethylene with a catalyst composition comprising a substituted phenylene aromatic diester that is 3-methyl-5-tert-butyl-1,2-phenylene dibenzoate and forming a propylene/ethylene copolymer.

6. The process of claim 1 comprising biaxially orienting the propylene-based polymer; and forming a film having a thickness from 2 microns to 20 microns.

7. The process of claim 1 comprising forming a film having a thickness from 2 microns to 20 microns and a dielectric strength from 620 KV/mm to 720 KV/mm as measured in accordance with DIN IEC 243-2.

8. The process of claim 1 comprising coating an electrical component with the wash-free propylene-based polymer.

9. The process of claim 1 comprising coating, with the wash-free propylene-based polymer, an electrical component selected from the group consisting of a transformer, a

capacitor, a switch, a regulator, a circuit breaker, a recloser, a fluid-filled transmission line, and combinations thereof.

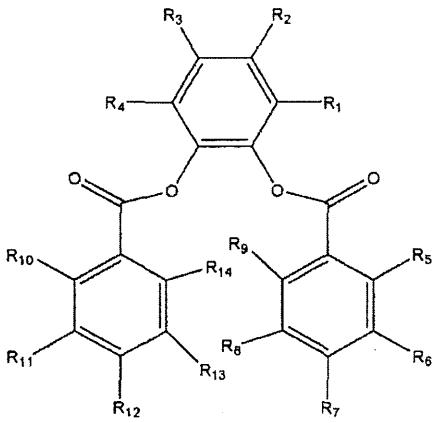
10. The process of claim 1 comprising forming a film on an electrical component, the film comprising the wash-free propylene-based polymer.

11. The process of claim 1 comprising forming a film having a thickness from 2 microns to 20 microns on a capacitor, the film comprising the wash-free propylene-based polymer and having a total ash content less than 30 ppm.

CLAIMS

1. A process comprising:

(a) contacting, under polymerization conditions, propylene and optionally one or more comonomers with an olefin polymerization catalyst composition comprising a magnesium moiety, a titanium moiety and an internal electron donor comprising a substituted 1,2-phenylene aromatic diester having structure (I) below;



(I)

wherein R_1-R_{14} are the same or different and each of R_1-R_{14} is selected from a hydrogen, substituted hydrocarbyl group having 1 to 20 carbon atoms, an unsubstituted hydrocarbyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, a heteroatom, and combinations thereof and wherein at least one of R_1-R_4 is selected from a substituted hydrocarbyl group having 1 to 20 carbon atoms, an unsubstituted hydrocarbyl group having 1 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, a heteroatom, and combinations thereof;

(b) a cocatalyst; and

forming a wash-free propylene-based polymer with a total ash content less than 30 ppm or less than 40 ppm in combination with a xylene solubles content of less than 4.0 wt.%,

wherein wash-free means that the propylene-based polymer is not subjected to (i) a wash procedure, (ii) a wash agent, or (iii) a wash column after polymerization in order to remove catalyst residues from the propylene-based polymer; and

xylene solubles xylene solubles is measured according to the following procedure:

(i) 0.4 g of polymer is dissolved in 20 ml of xylenes with stirring at 130°C for 30 minutes to form a solution;

(ii) the solution is then cooled to 25°C and after 30 minutes the insoluble polymer fraction is filtered off leaving a filtrate;

(iii) the filtrate is analyzed for soluble polymer content by Flow Injection Polymer Analysis using a Viscotek ViscoGEL H-100-3078 column with tetrahydrofuran mobile phase flowing at 1.0 ml/min. and with the column coupled to a Viscotek Model 302 Triple Detector Array, with light scattering, viscometer and refractometer detectors operating at 45°C; and

(c) forming a film or film coating with the wash-free propylene-based polymer.

2. The process of claim 1 comprising forming a wash-free propylene-based polymer with a property selected from the group consisting of from 0 ppm to 10 ppm aluminum, from 0 ppm to 10 ppm chlorine, from 0 ppm to 10 ppm magnesium, from 0 ppm to 10 ppm titanium, and combinations thereof.

3. The process of claim 1 comprising forming a propylene/ethyelene copolymer having an ethylene content from 0.1 wt% to 1.0 wt%.

4. The process of claim 1 comprising contacting propylene with a catalyst composition comprising 3-methyl-5-tert-butyl-1,2-phenylene dibenzoate; and forming a propylene homopolymer.

5. The process of claim 1 comprising contacting propylene and ethylene with a catalyst composition comprising 3-methyl-5-tert-butyl-1,2-phenylene dibenzoate and forming a propylene/ethylene copolymer.

6. The process of claim 1 comprising biaxially orienting the propylene-based polymer; and forming a film having a thickness from 2 microns to 20 microns.

7. The process of claim 1 comprising forming a film having a thickness from 2 microns to 20 microns and a dielectric strength from 620 KV/mm to 720 KV/mm as measured in accordance with DIN IEC 243-2.

8. The process of claim 1 comprising coating an electrical component with the wash-free propylene-based polymer.

9. The process of claim 1 comprising coating, with the wash-free propylene-based polymer, an electrical component selected from the group consisting of a transformer, a capacitor, a switch, a regulator, a circuit breaker, a recloser, a fluid-filled transmission line, and combinations thereof.

10. The process of claim 1 comprising forming a film on an electrical component, the film comprising the wash-free propylene-based polymer.

11. The process of claim 1 comprising forming a film having a thickness from 2 microns to 20 microns on a capacitor, the film comprising the wash-free propylene-based polymer and having a total ash content less than 30 ppm.