$VOBr(OCH_3)_2$, $VOBr(OC_2H_5)_2$, $VOBr(O\text{-}iso\text{-}C_4H_9)_2$, $VOBr_2(OC_3H_7)$, $VOBr_2(O\text{-}iso\text{-}C_3H_7)$, $VOBr_2(OC_4H_9)$, $VOBr_2(O\text{-}iso\text{-}C_4H_9)$, $VOI(OCH_3)_2$, $VOI(OC_2H_5)_2$, $VOI_2(OCH_3)$, $VOI_2(O\text{-}cyclo\text{-}C_3H_5)$, $VOI_2(OC_5H_{11})$, $VOI_2(O\text{-}cyclo\text{-}C_6H_{11})$, $Cr(O\text{-}iso\text{-}C_4H_9)_3$, $Mo(OC_2H_5)_3$, and the like. Carboxylic acid salts and various chelates of the transition metal can also be used but in general are less preferred. A few non-limiting examples of such salts and chelates include zirconyl acetate, uranyl butyrate, chromium acetate, chromium(III) oxy-2-ethylhexanoate, chromium(III) 2-ethylhexanoate, chromium(III) dichloroethylhexanoate, chromium(II) 2-ethylhexanoate, titanium(IV) 2-ethylhexanoate, bis(2,4-pentanedionate)titanium oxide, bis(2,4-pentanedionate)titanium dichloride, bis(2,4-pentanedionate)titanium dibutoxide, vanadyl acetylacetonate, chromium acetylacetonate, niobium acetylacetonate, zirconyl acetylacetonate, chromium octylacetoacetate, and the like. Also, transition metal alkyls such as tetramethyl titanium, methyl titanium trichloride, tetraethyl zirconium, tetraphenyl titanium, and the like can be used.

[0090] Preferred transition metal compounds of the well-known Ziegler-Natta catalyst compounds are those of the Group 4 (Group IVB) metals, including the alkoxides, halides, and mixed halide/alkoxide compounds. More preferred are $TiCl_4$, $ZrCl_4$, $HfCl_4$, and $TiCl_3$, with $TiCl_4$ being most preferred. Such more preferred compounds can be used in chelated form in order to facilitate solubility. Suitable chelated catalysts of this type are known and reported in the literature.

[0091] Metallocenes are another broad class of olefin polymerization catalyst compounds with which the activator compositions of this invention can be used in forming novel highly effective catalysts of this invention. As used herein, the term "metallocene" includes metal derivatives which contain at least one cyclopentadienyl moiety. Suitable metallocenes are well known in the art and include the metallocenes of Groups 3, 4, 5, 6 (Groups IIIB, IVB, VB, and VIB), lanthanide and actinide metals, for example, the metallocenes which are described in U.S. Pat. Nos. 2,864,843; 2,983,740; 4,665,046; 4,874,880; 4,892,851; 4,931,417; 4,952,713; 5,017,714; 5,026,798; 5,036,034; 5,064,802; 5,081,231; 5,145,819; 5,162,278; 5,245,019; 5,268,495; 5,276,208; 5,304,523; 5,324,800; 5,329,031; 5,329,033; 5,330,948, 5,347,025; 5,347,026~~; and 5,347,752~~, whose teachings with respect to such metallocenes are incorporated herein by reference.

i) forming an organoaluminum-treated support by contacting a support material and an organoaluminum compound,

ii) contacting said organoaluminum-treated support either

a) with a polyfunctional compound ~~which has at least two aromatic groups in which at least two of said aromatic groups each has at least one polar monoprotic group thereon~~, forming a mixture, and then contacting said mixture with an aluminoxane, or

b) with an aluminoxane, forming a mixture, and then contacting said mixture with a polyfunctional compound ~~which has at least two aromatic groups in which at least two of said aromatic groups each has at least one polar monoprotic group thereon~~, or

c) with a portion of a polyfunctional compound, forming a first mixture, contacting said first mixture with the aluminoxane, forming a second mixture, and contacting said second mixture with more polyfunctional compound,

wherein said polyfunctional compound has at least two aromatic groups in which at least two of said aromatic groups each has at least one polar monoprotic group thereon,

such that an activator composition is formed.

12. A process as in Claim 11 wherein said organoaluminum-treated support is contacted with the polyfunctional compound and the aluminoxane sequentially.

13. A process as in Claim 10 wherein R of the organoaluminum compound is in a molar ratio of about 1:1 or more relative to the polar monoprotic groups of the polyfunctional compound.

14. A process as in Claim 11 wherein the aluminoxane is methylaluminoxane and/or wherein the polyfunctional compound is 4,4'-ethylenediphenol, 4,4'-methylenebis(2,6-di(tert-butyl)-phenol), or 1,3,5-trimethyl-2,4,6-tris(3,5-di(tert-butyl)-4-hydroxybenzyl)benzene.

15. A process as in any of Claim 11 or 12 wherein

$VOBr(OCH_3)_2$, $VOBr(OC_2H_5)_2$, $VOBr(O\text{-}iso\text{-}C_4H_9)_2$, $VOBr_2(OC_3H_7)$, $VOBr_2(O\text{-}iso\text{-}C_3H_7)$, $VOBr_2(OC_4H_9)$, $VOBr_2(O\text{-}iso\text{-}C_4H_9)$, $VOI(OCH_3)_2$, $VOI(OC_2H_5)_2$, $VOI_2(OCH_3)$, $VOI_2(O\text{-}cyclo\text{-}C_3H_5)$, $VOI_2(OC_5H_{11})$, $VOI_2(O\text{-}cyclo\text{-}C_6H_{11})$, $Cr(O\text{-}iso\text{-}C_4H_9)_3$, $Mo(OC_2H_5)_3$, and the like. Carboxylic acid salts and various chelates of the transition metal can also be used but in general are less preferred. A few non-limiting examples of such salts and chelates include zirconyl acetate, uranyl butyrate, chromium acetate, chromium(III) oxy-2-ethylhexanoate, chromium(III) 2-ethylhexanoate, chromium(III) dichloroethylhexanoate, chromium(II) 2-ethylhexanoate, titanium(IV) 2-ethylhexanoate, bis(2,4-pentanedionate)titanium oxide, bis(2,4-pentanedionate)titanium dichloride, bis(2,4-pentanedionate)titanium dibutoxide, vanadyl acetylacetonate, chromium acetylacetonate, niobium acetylacetonate, zirconyl acetylacetonate, chromium octylacetoacetate, and the like. Also, transition metal alkyls such as tetramethyl titanium, methyl titanium trichloride, tetraethyl zirconium, tetraphenyl titanium, and the like can be used.

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