Claims

What is claimed is:

1. Bismuth compounds of the formula $Bi(R^a)_x(L)_{3-x}$ wherein

(i) x = 1 or 2;

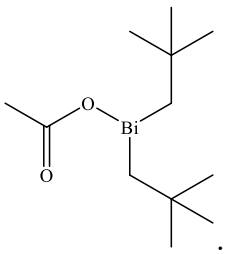
(ii) each R^a is independently one of an unsubstituted linear C_1-C_6 alkyl group, a linear C_1-C_6 alkyl group substituted with one or more halogen, a linear C_1-C_6 alkyl group substituted with an amino group, a linear C_3-C_6 alkyl group substituted with an alkoxy group, an unsubstituted branched C_3-C_6 alkyl group, a branched C_3-C_6 alkyl group substituted with one or more halogen, a branched C_3-C_6 alkyl group substituted with an amino group, a branched C_3-C_6 alkyl group substituted with an alkoxy group, $-Si(CH_3)_3$, an unsubstituted cyclic C_3-C_6 alkyl group, a cyclic C_3-C_6 alkyl group substituted with one or more halogen and a cyclic C_3-C_6 alkyl group substituted with an amino group; and

(iii) each L is a carboxylate group; and

(iv) the compound where x = 1, R^a is $-CH_3$ and each L is acetate is excluded.

2. The compound of claim 1, wherein each L is independently one of acetate, formate, pivalate, methacrylate and salicylate.

3. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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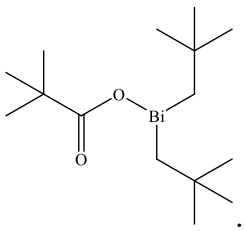
4. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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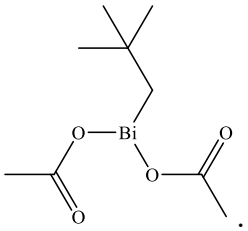
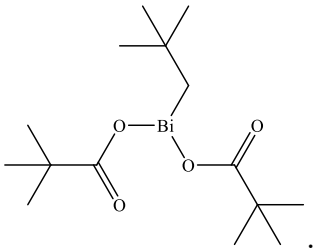
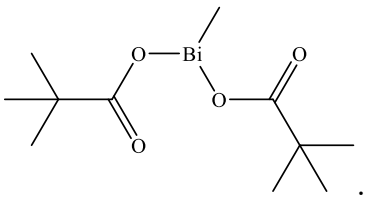
5. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



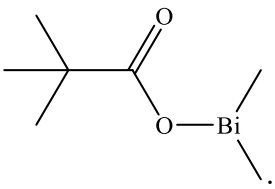
6. The compound of claim 1, wherein compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



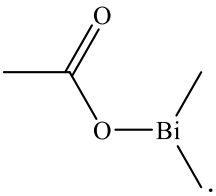
7. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



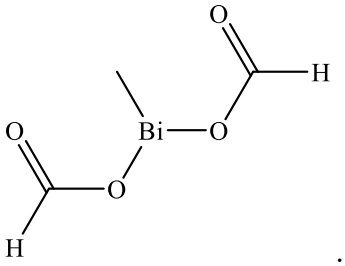
8. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



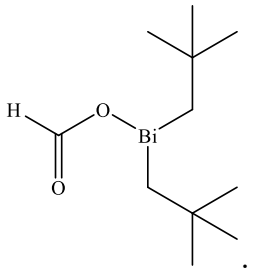
9. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



10. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



11. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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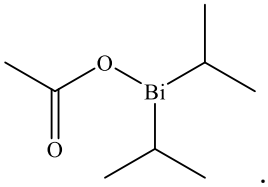
12. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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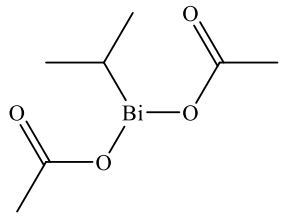
13. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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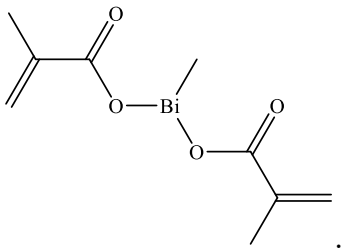
14. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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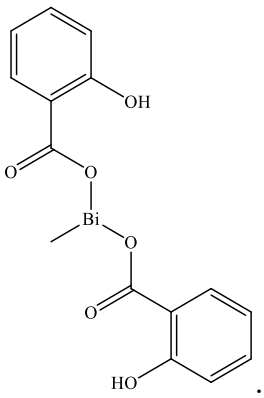
15. The compound of claim 1, wherein the compound of the formula $Bi(R^a)_x(L)_{3-x}$ is:



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16. A method of depositing a bismuth-containing film on a substrate in a reactor comprising the steps of:

(a) providing the substrate to the reactor;

(b) contacting the substrate with one or more bismuth-containing compound of

claim 1 and one or more coreactant; and

(c) forming a bismuth-containing film on the substrate.

17. The method of depositing of claim 16, wherein the one or more coreactant comprises water.