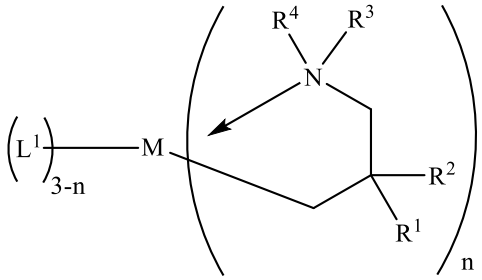
CLAIMS

What is claimed is:

1. A precursor having Formula I:



Formula I

wherein

(a) R^1 and R^2 (i) are each independently one of a C_1-C_6 linear alkyl group, a C_3-C_6 branched alkyl group and a C_3-C_6 cyclic alkyl group or (ii) are linked to form one of a 3-member ring, a 4-member ring, a 5-member ring and a 6-member ring;

(b) R^3 and R^4 are each independently one of a C_1-C_6 linear alkyl group, a C_3-C_6 branched alkyl group and a C_3-C_6 cyclic alkyl group;

(c) n = 1-3;

(d) M is one of B, Al, Ga and In; and

(e) L^1 is one of a C_1-C_6 linear alkyl group, a C_3-C_6 branched alkyl group and an amino group of formula $-NR^5R^6$ wherein R^5 and R^6 are each independently one of a C_1-C_6 linear alkyl group and a C_3-C_6 branched alkyl group.

2. The precursor of claim 1, wherein M is B.

3. The precursor of claim 1, wherein M is Al.

4 The precursor of claim 1, wherein M is Ga.

5. The precursor of claim 1, wherein M is In.

6. The precursor of any of claims 1-5, wherein n = 1.

7. The precursor of any of claims 1-5, wherein n = 2.

8. The precursor of any of claims 1-5, wherein n = 3.

9. The precursor of claim 1, wherein M = In, n = 1, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

10. The precursor of claim 1, wherein M = In, n = 2, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

11. The precursor of claim 1, wherein M = Ga, n = 1, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

12. The precursor of claim 1, wherein M = Ga, n = 2, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

13. The precursor of claim 1, wherein M = Al, n = 1, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

14. The precursor of claim 1, wherein M = Al, n = 2, L^1 = Me and each of R^1, R^2, R^3 and R^4 = Me.

15. The precursor of claim 1, wherein M = In, n = 1, L^1 = -NR^5R^6 where R^5 and R^6 = Et and each of R^1, R^2, R^3 and R^4 = Me.

16. The precursor of claim 1, wherein M = Al, n = 1, L^1 = -NR^5R^6 where R^5 and R^6 = Et and each of R^1, R^2, R^3 and R^4 = Me.

17. The precursor of claim 1, wherein M = Ga, n = 1, L^1 = -NR^5R^6 where R^5 and R^6 = Et and each of R^1, R^2, R^3 and R^4 = Me.

18. The precursor of claim 1, wherein M = In, n = 1, L^1 = Me, each of R^1, R^2 and R^3 = Me and R^4 = Et.

19. The precursor of claim 1, wherein M = In, n = 1, L^1 = Me, R^1 and R^2 are linked to form a cyclopropyl group ("^{cy}Pr") and each of R^3 and R^4 = Me.

20. The precursor of claim 1, wherein M = In, n = 1, L^1 = Me, R^1 and R^2 are linked to form a cyclopentyl group ("^{cy}Pent") and each of R^3 and R^4 = Me.

21. A method for forming a Group 13 metal-containing film on at least one surface of a substrate comprising:

a. providing the at least one surface of the substrate in a reaction vessel;

b. forming a Group 13 metal-containing film on the at least one surface by a deposition process chosen from a chemical vapor deposition (CVD) process and an atomic layer deposition (ALD) process using the precursor of any of claims 1-20 as a metal source compound for the deposition process.

22. A precursor supply package, comprising a vessel and the precursor of any of claims 1-20, wherein the vessel is adapted to contain and dispense the precursor.