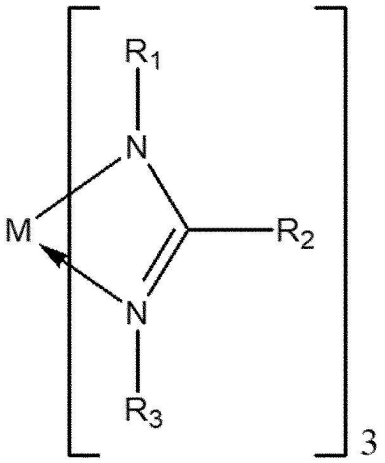
CLAIMS

[Claim 1] A precursor for forming a scandium- or yttrium-containing thin film, the precursor comprising a scandium- or yttrium-containing compound represented by Chemical Formula 1 below,

wherein the scandium-containing compound is a liquid at room temperature,

[Chemical Formula 1]



wherein in Chemical Formula 1,

M is a scandium or yttrium metal, R_1 and R_3 are both the same and are straight-chain, branched-chain, or cyclic alkyl or alkenyl groups having 1 to 5 carbon atoms, and R_2 is a hydrogen atom or a straight-chain, branched-chain, or cyclic alkyl or alkenyl group having 1 to 6 carbon atoms.

[Claim 2] The precursor of claim 1, wherein in Chemical Formula 1, R_2 is a straight-chain, branched-chain, or cyclic alkyl or alkenyl group having 2 to 4 carbon atoms.

[Claim 3] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are both the same and are straight-chain,

branched-chain, or cyclic alkyl or alkenyl groups having 2 to 5 carbon atoms, and R_2 is a straight-chain, branched-chain, or cyclic alkyl or alkenyl group having 2 to 4 carbon atoms.

[Claim 4] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are methyl groups.

[Claim 5] The precursor of claim 1, wherein in Chemical Formula 1, R_2 is an isopropyl group.

[Claim 6] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are both the same and are straight-chain alkyl or alkenyl groups having 1 to 5 carbon atoms.

[Claim 7] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are both the same and are straight-chain alkyl or alkenyl groups having 1 to 5 carbon atoms, and R_2 is a straight-chain alkyl or alkenyl group having 1 to 4 carbon atoms.

[Claim 8] The precursor of claim 1, wherein in Chemical Formula 1, R_1 to R_3 are all the same and are straight-chain, branched-chain, or cyclic alkyl or alkenyl groups having 1 to 4 carbon atoms.

[Claim 9] The precursor of claim 1, wherein the precursor has a viscosity of 60 cP or less.

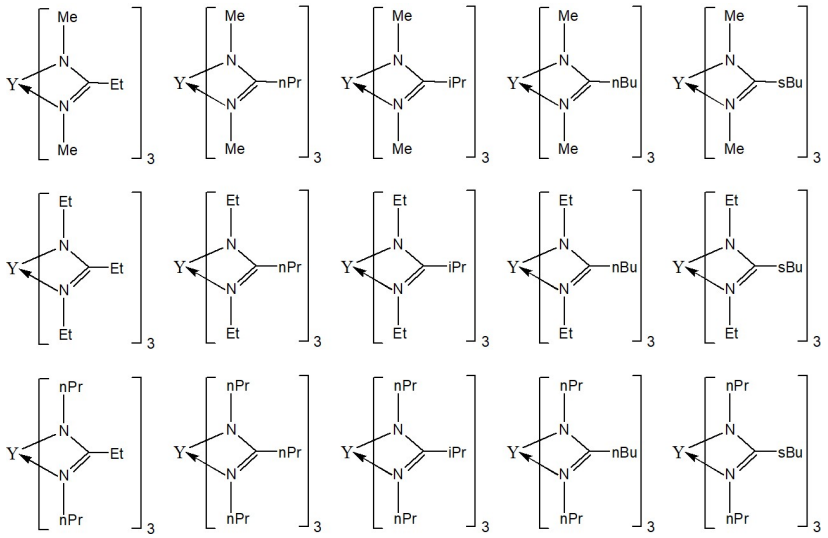
[Claim 10] The precursor of claim 1, wherein the precursor has a melting point of 70°C or lower.

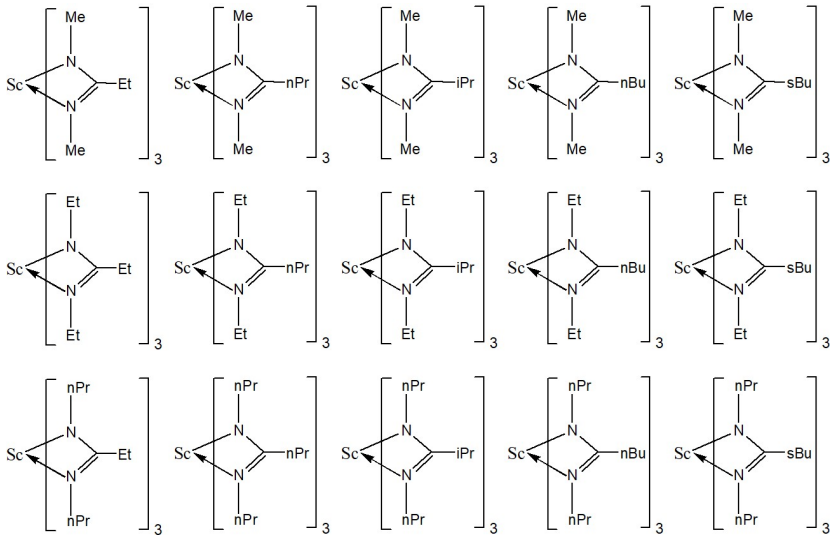
[Claim 11] The precursor of claim 1, further comprising a solvent.

[Claim 12] The precursor of claim 11, wherein the solvent is one or more of a saturated or unsaturated hydrocarbon having 1 to 16 carbon atoms, a ketone, an ether, glyme, an ester, tetrahydrofuran (THF), and a tertiary amine.

[Claim 13] The precursor of claim 11, wherein the solvent is included in an amount range of 1 to 99 wt% with respect to the total weight of the precursor.

[Claim 14] The precursor of claim 1, wherein the scandium- or yttrium-containing compound represented by Chemical Formula 1 is at least one selected from the group consisting of the following chemical structures.





[Claim 15] A method for forming a scandium- or yttrium-containing thin film, the method comprising a process of forming a thin film on a substrate using the precursor of claim 1 or 11.

[Claim 16] The method of claim 15, wherein the process of forming the thin film on the substrate comprises:

a process of forming a precursor thin film through deposition of the precursor onto the surface of the substrate; and

a process of reacting the precursor thin film with a reactive gas.

[Claim 17] The method of claim 16, wherein the process of forming the precursor thin film comprises a process of vaporizing the precursor to transfer the resulting vapor of the precursor into a chamber.

[Claim 18] The method of claim 16, wherein the deposition is performed by any one process of spin-on dielectric (SOD)

deposition, low-temperature plasma (LTP) deposition, chemical vapor deposition (CVD), plasma enhanced chemical vapor deposition (PECVD), high-density plasma chemical vapor deposition (HDPCVD), atomic layer deposition (ALD), or plasma enhanced atomic layer deposition (PEALD).

[Claim 19] The method of claim 15, wherein the process of forming the thin film on the substrate comprises: feeding the precursor onto the substrate and applying a plasma, thereby forming the thin film.

[Claim 20] A semiconductor device comprising a scandium- or yttrium-containing thin film manufactured by the method of claim 15.