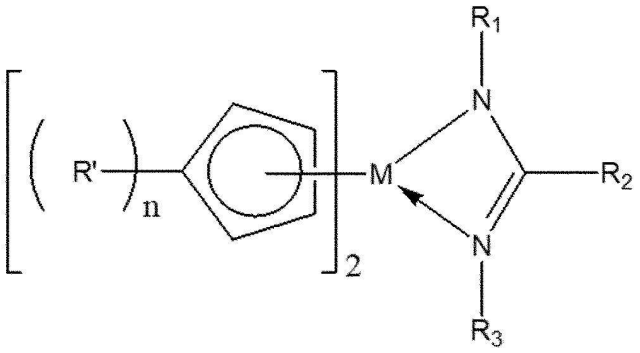
CLAIMS

[Claim 1] A precursor for forming an yttrium- or scandium-containing thin film, the precursor comprising an yttrium- or scandium-containing compound represented by Chemical Formula 1 below, wherein the precursor has a viscosity of 60 cP or less and a melting point of 70°C or lower and is a liquid at room temperature,

[Chemical Formula 1]



wherein in Chemical Formula 1,

M is an yttrium (Y) or scandium (Sc) metal, R_1 and R_3 are each independently a straight-chain or cyclic alkyl or alkenyl group having 1 to 5 carbon atoms, R_2 is a straight-chain, branched-chain, or cyclic alkyl or alkenyl group having 2 to 4 carbon atoms, each R' is the same or different and is a hydrogen atom or a straight-chain, branched-chain, or cyclic alkyl or alkenyl group having 1, 2, or 4 carbon atoms, and n is an integer in a range of 1 to 5.

[Claim 2] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are each independently a straight-chain or cyclic alkyl or alkenyl group having 2 to 5 carbon atoms.

[Claim 3] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are methyl groups.

[Claim 4] The precursor of claim 1, wherein in Chemical Formula 1, R_2 is an isopropyl group.

[Claim 5] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are each independently a straight-chain alkyl or alkenyl group having 1 to 5 carbon atoms.

[Claim 6] The precursor of claim 1, wherein in Chemical Formula 1, R_1 and R_3 are each independently a straight-chain alkyl or alkenyl group having 1 to 5 carbon atoms, and R_2 is a straight-chain alkyl or alkenyl group having 2 to 4 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 or cyclic alkyl or alkenyl groups having 1 to 5 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 or cyclic alkyl or alkenyl groups having 1 to 4 carbon atoms.

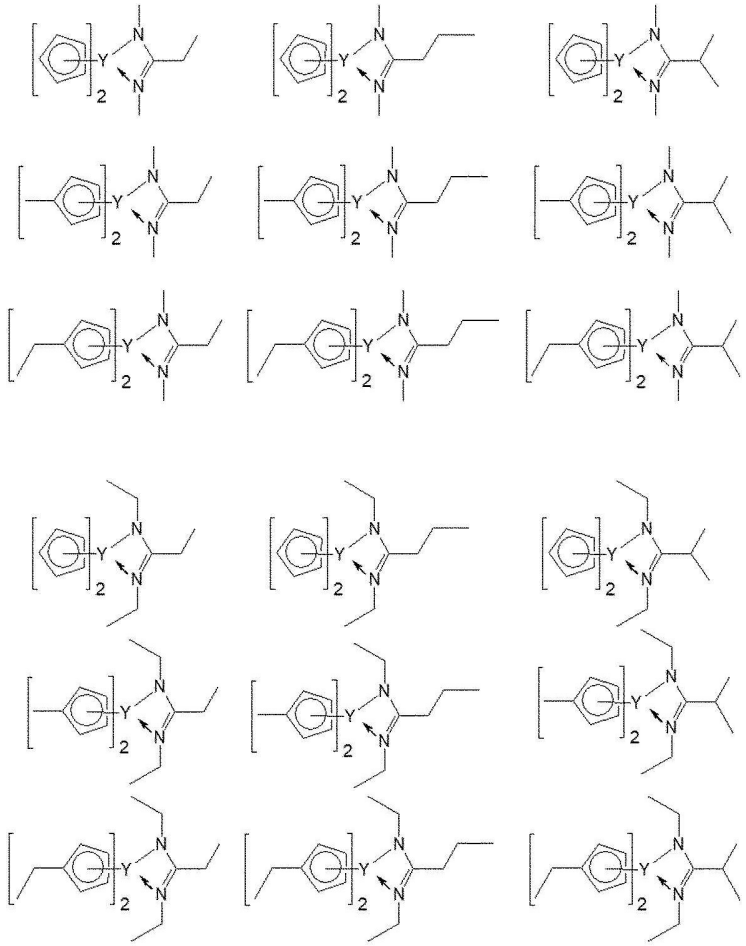
[Claim 9] The precursor of claim 1, further comprising a solvent.

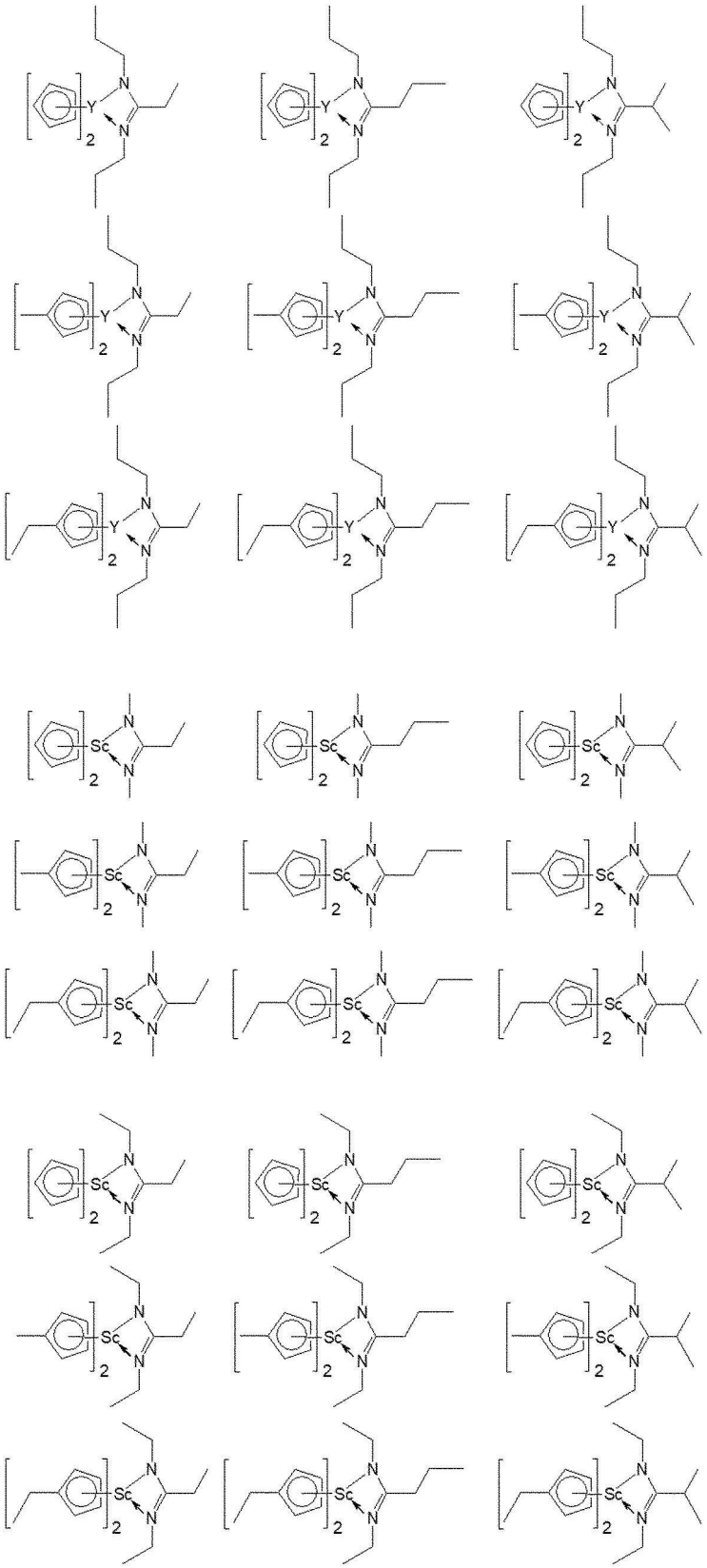
[Claim 10] The precursor of claim 9, wherein the solvent is one or more of a saturated or unsaturated hydrocarbon having 1 to 16 carbon atoms, a ketone, an ether, glyme, an ester, tetrahydrofuran (THF), and a tertiary amine.

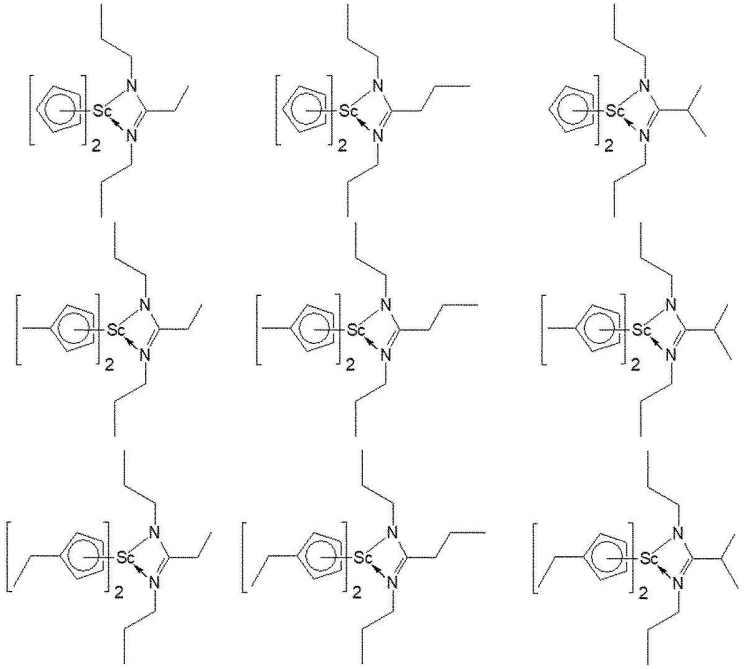
[Claim 11] The precursor of claim 9, wherein the solvent is

included in an amount range of 1 to 99 wt% with respect to the total weight of the precursor.

[Claim 12] The precursor of claim 1, wherein the precursor is at least one selected from the group consisting of the following structures.







[Claim 13] 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 9.

[Claim 14] The method of claim 13, 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 15] The method of claim 14, 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 16] The method of claim 14, 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 17] The method of claim 13, 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 18] A semiconductor element comprising a scandium- or yttrium-containing thin film manufactured by the method of claim 13.