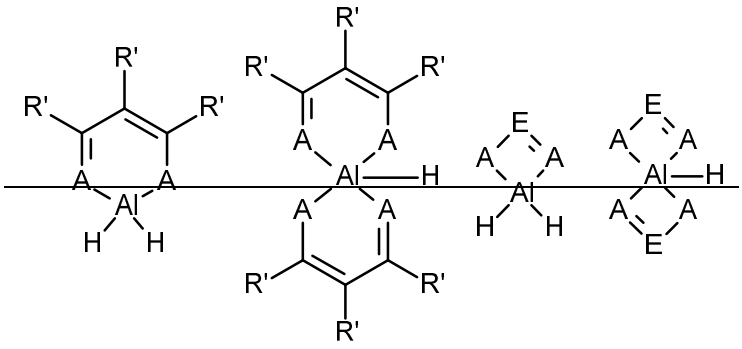
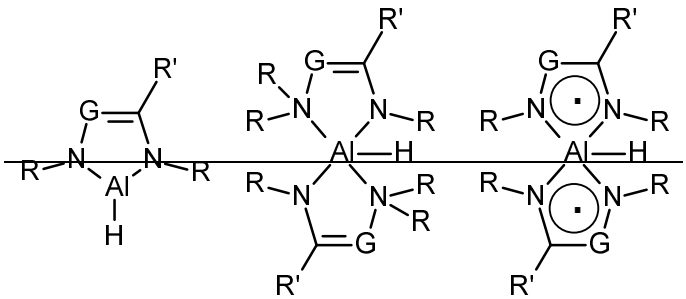
Claims

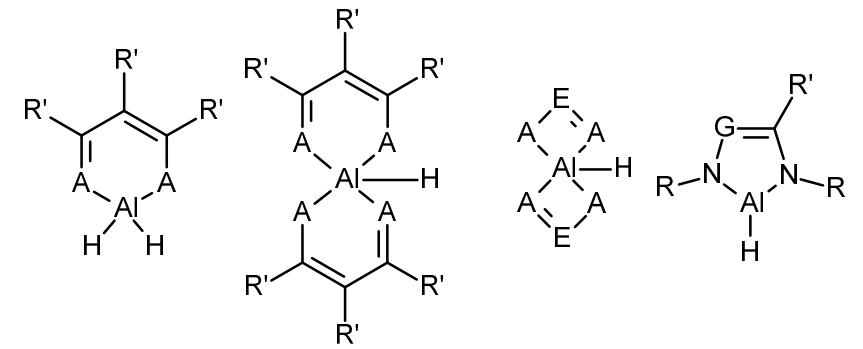
1. Process for preparing inorganic metal- or semimetal-containing films comprising
(a) depositing a metal- or semimetal-containing compound from the gaseous state onto a solid substrate and
(b) bringing the solid substrate in contact with a compound of general formula (I), (II), ~~(III),~~ (IV), or (V)~~, (VI), or (VII)~~ in the gaseous state



(I) (II) (III) (IV)



(V) (VI) (VII)



(I) (II) (IV) (V)

wherein A is NR or O,
E is CR'', CNR''_2, N, PR''_2, or SOR''
G is CR'~~ or N~~,
R is an alkyl group, an alkenyl group, an aryl group, or a silyl group and
R' and R'' are hydrogen, an alkyl group, an alkenyl group, an aryl group, or a silyl group, wherein the compound of general formula (I), (II), (IV), or (V) has a molecular weight of

not more than 500 g/mol.

2. The process according to claim 1, wherein R is methyl, ethyl, iso-propyl, sec-butyl, tert-butyl, trimethylsilyl.

3. The process according to claim 1 or 2, wherein R bears no hydrogen atom in the 1-position.

4. The process according to any of the claims 1 to 3, wherein R' in the 3 position of the ligand in the compound of general formula (I) or (II) is H.

5. The process according to any of the claims 1 to 4, wherein the metal- or semimetal-containing compound contains Ti, Ta, Mn, Mo, W, Ge, Ga, As, In, Sb, Te, Al or Si.

6. The process according to any of the claims 1 to 5, wherein the metal- or semimetal-containing compound is a metal or semimetal halide.

7. The process according to any of the claims 1 to 6, wherein the sequence containing (a) and (b) is performed at least twice.

8. The process according to any of the claims 1 to 7, wherein the process is an atomic layer deposition process.

9. The process according to any of the claims 1 to 8, wherein the compound of general formula (I), (II), (III), (IV), (V), (VI), or (VII) has a molecular weight of not more than 600 g/mol.

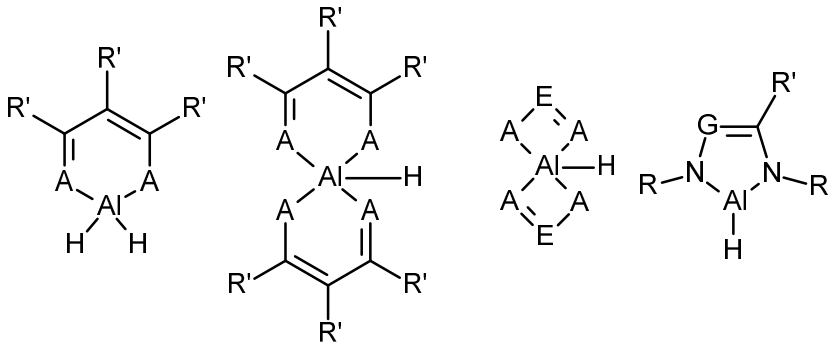
10. The process according to any of the claims 1 to 9, wherein the compound of general formula (I), (II), (III), (IV), (V), (VI), or (VII) has a vapor pressure at least 1 mbar at a temperature of 200 °C.

11. The process according to any of the claims 1 to 10, wherein the compound of general formula (I), (II), (III), (IV), (V), (VI), or (VII) has a melting point of -80 to 125 °C.

~~12. The process according to any of the claims 1 to 11, wherein the inorganic metal- or semimetal-containing films contains a metal, a metal nitride, a metal carbide, a metal carbonitride, a metal alloy, an intermetallic compound or mixtures thereof.~~

~~13.~~12. The process according to any of the claims 1 to 1~~2~~1, wherein the inorganic metal- or semimetal-containing films contains less than 5 weight-% nitrogen.

~~14.~~13. Use of a compound of general formula (I), (II), ~~(III),~~ (IV), or (V)~~, (VI), or (VII)~~



(I) (II) (IV) (V)

wherein A is NR or O,
E is CR'', CNR''_2, N, PR''_2, or SOR''
G is CR',
R is an alkyl group, an alkenyl group, an aryl group, or a silyl group and
R' and R'' are hydrogen, an alkyl group, an alkenyl group, an aryl group, or a silyl group,
wherein the compound of general formula (I), (II), (IV), or (V) has a molecular weight of not more than 500 g/mol,
as reducing agent in a vapor deposition process.

~~15.~~14. Use according to claim 1~~4~~3, wherein the vapor deposition process is an atomic layer deposition process.