a) providing a surface having at least one dielectric material and at least one metal material exposed thereon simultaneously;

b) exposing the surface to a vapor of $(NMe_2)_2Al(-NEt-(CH_2)_2-NEt_2)$; and

c) exposing the surface to a co-reactant H_2O;

wherein the at least one dielectric material is at least partially blocked by a blocking agent dimethyldichlorosilane (DMDCS) from the deposition of the Al_2O_3 film through an ALD process.

[0017] The disclosed processes may include one or more of the following aspects:

- the vapor deposition process being an ALD process;
- the process further comprising exposing the surface to a co-reactant selected from an oxidizer agent or a nitrogen agent;
- the co-reactant being selected from O_3, O_2, H_2O, H_2O_2, D_2O, ROH wherein R = C_1 – C_{10} linear or branched hydrocarbon or combinations thereof;
- the co-reactant being selected from NH_3, NO, N_2O, hydrazines, amines or combinations thereof;
- the co-reactant being H_2O;
- the blocking agent forming a SAM layer on the at least one of the materials by dipping the surface in the blocking agent or vapor spraying the surface with the blocking agent;
- the plurality of the materials including at least a dielectric material and at least a metal material on the surface;
- the metal-containing film being deposited on the dielectric film but not deposited on the metal film by blocking the reactivity of the metal film by a metal blocking agent;
- the metal blocking agent being selected from a alkyl or fluoroalkyl compounds having a surface reactive chemical function group selected from phosphonic acids, carboxylic acids, thiols, or triazoles;
- the metal-containing film being deposited on the metal material but not deposited on the dielectric material by blocking the reactivity of the dielectric material by a dielectric blocking agent;
- the dielectric blocking agent being a compound having the formula $R_{4-a}SiX_a$, wherein each X are independently a surface hydroxyl reactive group (halide, alkylamino, alkoxy, acetamide, etc.), and each R are selected from H, a C_1-C_{20} alkyl or fluoroalkyl group or mixture thereof;
- the surface being exposed to the precursor at a temperature ranging from room

$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-NEt-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_iPr-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_nPr-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_iBu-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_nBu-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_tBu-$(CH_2)_2$-NEt_2), $(N_nBu_2)_2Al$(-N_sBu-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-NMe-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-NEt-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_iPr-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_nPr-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_iBu-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_nBu-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_tBu-$(CH_2)_2$-NEt_2), $(N_iBu_2)_2Al$(-N_sBu-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-NMe-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-NEt-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_iPr-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_nPr-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_iBu-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_nBu-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_tBu-$(CH_2)_2$-NEt_2), $(N_tBu_2)_2Al$(-N_sBu-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-NMe-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-NEt-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-N_iPr-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-N_nPr-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-N_iBu-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-N_nBu-$(CH_2)_2$-NEt_2), $(N_sBu_2)_2Al$(-N_tBu-$(CH_2)_2$-NEt_2), or $(N_sBu_2)_2Al$(-N_sBu-$(CH_2)_2$-NEt_2);

- the composition comprising between approximately 95% by weight or w/w and approximately 100.0% w/w of the precursor;
- the composition comprising between approximately 99% by weight or w/w and approximately 99.999% w/w of the precursor;
- the composition comprising between approximately 99% by weight or w/w and approximately 100.0% w/w of the precursor;
- the composition comprising between approximately 0.0% by weight or w/w and approximately 5.0% w/w impurities;
- the composition comprising between approximately 0.0% by weight or w/w and approximately 0.1% w/w impurities; and
- the composition comprising between approximately 0 ppbw and approximately 500 ppbw metal impurities.

Notation and Nomenclature

[0020] The following detailed description and claims utilize a number of abbreviations, symbols, and terms, which are generally well known in the art, and include:

[0021] As used herein, the indefinite article “a” or “an” means one or more.

[0022] As used herein, “about” or “around” or “approximately” in the text or in a claim means ±10% of the value stated.

[0023] As used herein, “room temperature” in the text or in a claim means from approximately 20°C to approximately 25°C.

[0024] The term “ambient temperature” refers to an environment temperature