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(54) Title: METHOD OF FORMING DIELECTRIC FILMS, NEW PRECURSORS AND THEIR USE IN THE SEMI-CONDUCTOR MANUFACTURING

(57) Abstract: Method of deposition on a substrate, of a metal containing dielectric film comprising a compound of the formula (I): $(M_{1-a}^{1}M_a^{2})O_bN_c$, (I) wherein $0 \leq a < 1$, $0 < b \leq 3$, $0 \leq c \leq 1$, M^1 represents a metal selected from (Hf), (Zr) and (Ti); and M^2 represents a metal atom, which comprises the following steps: - A step a) of providing a substrate into a reaction chamber; - A step (b) of vaporizing a M^1 metal containing precursor of the formula (II): $(R^1_yOp)_x(R^2_zCp)_z M^1 R'_{4-x-z}$ (II) wherein $0 \leq x \leq 3$, preferably $x = 0$ or 1, $0 \leq z \leq 3$, preferably $z = 1$ or 2, $1 \leq (x + z) \leq 4$, $0 \leq y \leq 7$, preferably $y = 2$, $0 \leq t \leq 5$, preferably $t = 1$, (R^1_yOp) represents a pentadienyl ligand, which is either unsubstituted or substituted; (R^2_zCp) represents a cyclopentadienyl (Cp) ligand, which is either unsubstituted or substituted, to form a first gas phase metal source; - A step c) of introducing the first gas phase metal source in the reaction chamber, in order to provoke their contact with said substrate, to generate the deposition of a metal containing dielectric film comprising a compound of the formula (I) as hereinbefore defined, on said substrate. Compound the formula (II): $(R^2_zCp)M^1[N(R^{39})(R^{40})]_3$ (II₁) corresponding to the formula (II) as hereinabove defined in Claim 1, wherein $x = 0$, $z = 1$ and R' represents the group $N(R^{39})(R^{40})$.

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