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(54) Title: SELECTIVE THERMAL ATOMIC LAYER DEPOSITION

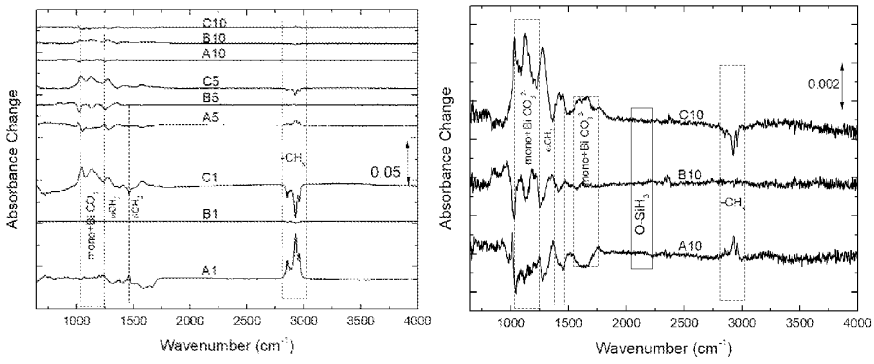

FIG. 1

(57) Abstract: A selective thermal atomic layer deposition (ALD) process is disclosed. The process may comprise loading a substrate comprising a dielectric material, and a metal, into a reactor. The substrate may be reacted with a non-plasma based oxidant, thereby forming an oxidized metal surface on the metal. The substrate may be heated and exposed to a passivation agent that adsorbs more onto the oxidized metal than the dielectric material. Such exposure may form a passivation layer on the oxidized metal surface, and the substrate may be exposed to a silicon precursor that adsorbs more onto the dielectric material than the passivation layer, forming a chemi-adsorbed silicon-containing layer on the dielectric material. The substrate may be exposed to the non-plasma based oxidant, that simultaneously partially oxidizes the passivation layer, and oxidizes the chemi-adsorbed silicon-containing layer to form a silicon-containing dielectric film on the dielectric material.

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