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(71) Applicant: **VERSUM MATERIALS US, LLC** [US/US]; 8555 South River Parkway, Tempe, Arizona 85284 (US).

(72) Inventors: **PEARLSTEIN, Ronald M.**; Versum Materials Us, Llc, 8555 South River Parkway, Tempe, Arizona 85284 (US). **LEI, Xinjian**; Versum Materials Us, Llc, 8555 South River Parkway, Tempe, Arizona 85284 (US). **RIDGEWAY, Robert Gordon**; Versum Patents Us, Llc, 8555 South River Parkway, Tempe, Arizona 85284 (US). **WU, Aiping**; Versum Patents Us, Llc, 8555 South River Parkway, Tempe, Arizona 85284 (US). **LEE, Yi-chia**; Versum Materials Us, Llc, 8555 South River Parkway, Tempe, Arizona 85284 (US). **AGARWAL, Sumit**; 7072 Taft St., Arvada, Colorado 80004 (US). **RAMESH, Rohit Narayanan Kavassery**; 1620 Washington Ave., Golden, Colorado 80401 (US). **XU, Wanxing**; 1903 Tangent Way, Unit 65, Golden, Colorado 80401 (US). **GASVODA, Ryan James**; 1389 Pike St., Golden, Colorado 80401 (US).

(54) Title: SELECTIVE PLASMA ENHANCED ATOMIC LAYER DEPOSITION

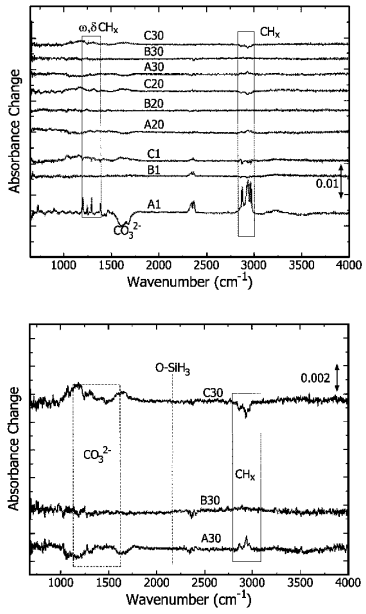

FIG. 1

(57) **Abstract:** A selective plasma enhanced 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 that the passivation layer, forming a chemi-adsorbed silicon-containing layer on the dielectric material. The substrate may be exposed to a plasma based oxidant, that simultaneously partially oxidizes the passivation layer, and oxidizes the chemi-adsorbed silicon-containing layer to form a dieclectric film on the dielectric material.

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(74) **Agent: DEMARAH, JR., Daniel A.**; Versum Patents US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US).

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