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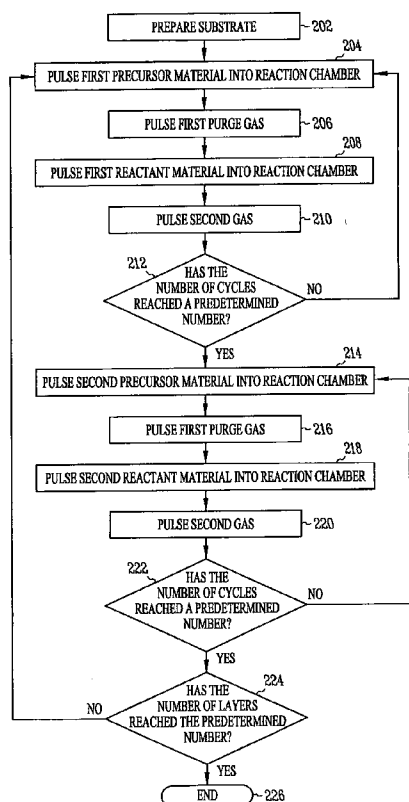
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(54) Title: ZIRCONIUM SUBSTITUTED BARIUM TITANATE GATE DIELECTRICS



(57) Abstract: The use of atomic layer deposition (ALD) to form a zirconium substituted layer of barium titanium oxide (BaTiO₃), produces a reliable structure for use in a variety of electronic devices such as a dielectric in nonvolatile random access memories (NVRAM), tunable dielectrics for multi layer ceramic capacitors (MLCC), infrared sensors and electro-optic modulators. The structure is formed by depositing alternating layers of barium titanate and barium zirconate by ALD on a substrate surface using precursor chemicals, and repeating to form a sequentially deposited interleaved structure of desired thickness and composition. Such a layer may be used as the gate insulator of a MOSFET, or as a capacitor dielectric. The properties of the dielectric may be tuned by adjusting the percentage of zirconium to titanium to optimize properties such as a dielectric constant, Curie point, film polarization, ferroelectric property and a desired relaxor response.



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