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Titanium Isopropoxide Precursor Volume Consumption as a Function of Temperature for Titanium Dioxide Thin Films Grown by Atomic Layer Deposition[1] COSTEL CONSTANTIN, James Madison University — Atomic layer deposition (ALD) offers tremendous opportunities for controlling material synthesis on an atomic level and for creating nanolayers with unique new functionalities. ALD is a chemical gas phase thin film deposition method based on alternating surface reactions that employs two or more precursors. ALD is often used for growth of high k dielectric constant oxide films. Titanium dioxide material have a k value of 80, and a band gap of $\sim$ 3 eV, and due to strong oxidizing properties thin films coated on construction materials and glass have fog proof, and self cleaning properties. Our ALD reactor employs liquid Titanium Isopropoxide $[Ti\{OCH(CH_3)_2\}_4]$ as a metal precursor and distilled H_2O as an oxygen source to grow thin films of titanium dioxide $[TiO_2]$ on silicon [Si], gallium nitride [GaN], and Aluminium foil [Al-foil] substrates. Titanium Isopropoxide exhibit a vapor pressure surge above 40° C and we report the volume precursor consumption as a function of precursor temperature and thin film thickness for ALD grown TiO_2on Si, GaN, and Al-foil substrates. We will also present dielectric constants of the TiO_2 thin films measured with a variable angle spectroscopic ellipsometer.

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