Interfacial properties of ultra thin $Hf_xSi_{1-x}O_2$ films grown by ALCVD using $Hf(N(C_2H_5)_2)_4$ and $Si(OC_4H_9)_4$ for CMOS application

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Ultra-thin $Hf_xSi_{1-x}O_2$, grown on Si surfaces by atomic layer chemical vapor deposition (ALCVD), were characterized in terms of their interface properties using x-ray photoelectron spectroscopy (XPS) and high-resolution transmission electron spectroscopy (HRTEM). The formation of Hf-silicide at $Hf_xSi_{1-x}O_2$/Si interfaces was induced by the reaction of metallic Hf atoms with Si substrate atoms. The capacitance and leakage current density of Au/Hf-silicate/Si structures were analyzed before and after N2 rapid thermal annealing (RTA).

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