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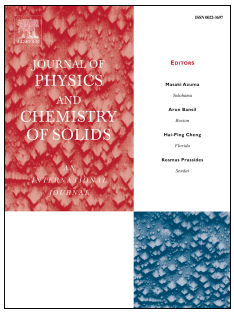

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Cobalt Germanide Nanostructure Formation and Memory Characteristic Enhancement in Silicon Oxide Films

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Abstract

We investigated nano-floating gate memory having a charge trap layer (CTL) composed of cobalt germanide nanostructure (ns-CoGe). A tunneling oxide layer; a CTL containing Co, Ge, and Si; and a blocking oxide layer were sequentially deposited on a p-type silicon substrate by RF magnetron sputtering and low-pressure chemical vapor deposition. We optimized the CTL formation conditions by rapid thermal annealing at a somewhat low temperature (about 830°C) by considering the differences in Gibbs free energy and chemical enthalpy among the components. To characterize the charge storage properties, capacitance–voltage (*C*–*V*)