

## Structural and chemical separation of TaSiN thin film for using the electrode of PRAM device

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Phase-change Random Access Memory (PRAM) device needs the electrode functions such as the stable resistor, diffusion barrier, stable power supply on SET and RESET, etc. We investigated the structural and chemical states of TaSiN thin film for using the electrode of PRAM device. TaSiN thin films were deposited by using co-sputtering method at room temperature with Si substrate and variable ratio of TaN and Si concentrations. We found that Si nano- and micro-clusters were randomly distributed in the TaSiN thin films measured by high-resolution transmission electron microscopy (HRTEM) and scanning electron microscopy (SEM). In chemical analysis by using high-resolution x-ray photoelectron spectroscopy (HRXPS) with the synchrotron radiation, chemical states of the thin films were also separated with TaN and Si, respectively. We assumed that TaSiN thin films was composed with TaN matrix and Si clusters. Also, we expect that it will be contributed to the electrode for PRAM device.