Formation and thermal stability of ternary silicides thin films formed by the reaction between Co-Ni layers and Si substrate

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Abstract
In this work, we studied the formation and the thermal stability of silicides formedby thermal annealed ofCo/Ni/Si(100) systembetween300°C and 800°C using a conventional furnace. The obtained specimens were investigated using four probe pointe, Raman spectroscopy and Rutherford backscattering spectroscopy (RBS). The formation of $(Co_xNi_{1-x})Si_2$ternary silicide was confirmed by a shift in peaks position in the Raman spectra toward the lowest wavenumbers when the temperature is increased up to 500°C. The final thickness of the composite$(Co_xNi_{1-x})Si_2$was approximately 50nm and it maintained its sheet resistance below 4.5Ω/sq after silicidation annealing at 800°C. The proposed $(Co_xNi_{1-x})Si_2$ silicides may be superior to conventional single phased silicides due to their improved thermal stability and thickness adjustment.

Keywords*:* Thin films, nickel silicides, RBS, Ternary silicide, Raman.