

Ni Silicide Formation and the Crystalline Silicon Film Growth

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Silicides have been commonly used in the Si technology due to the compatibility with Si. Recently the silicide has been applied in solar cells [1] and nanoscale interconnects [2]. The modulation of Ni silicide phase is an important issue to satisfy the needs. The excellent electric-conductive nickel monosilicide (NiSi) nanowire has proven the low resistive nanoscale interconnects. Otherwise the Ni disilicide (NiSi₂) provides a template to grow a crystalline Si film above it by the little lattice mismatch of 0.4% between Si and NiSi₂.

We present the formation of Ni silicide phases performed by the single deposition and the co-deposition methods. The co-deposition of Ni and Si provides a stable Ni silicide phase at a reduced processing temperature comparing to the single deposition method. It also discusses the Schottky contact formation between the Ni silicide and the grown crystalline Si film for the solar cell application.

References

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- [2] J. Kim, C.-S. Han, Y. C. Park, and Wayne A. Anderson, Appl. Phys. Lett. 92, 043501 (2008).