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Preparation of NiSi thin films by MOCVD using the novel $Ni(dmamp)_2$ precursor

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Nickel monosilicide (NiSi) is a promising candidate for self-aligned-silicide (salicide) process in sub-50 nm complementary-metal oxide-semiconductor (CMOS) technology, because of its low resistivity, low silicon consumption, low formation temperature, and line width-independent silicidation.

In this study, NiSi thin films were deposited on the Si(001) substrate using $Ni(dmamp)_2$ [dmamp = 1-dimethylamino-2-methyl-2-propanolate] by low pressure metal-organic chemical vapor deposition (MOCVD). Two different deposition processes were compared. First, the NiSi thin films were directly deposited at the substrate temeprature of 350-750 ℃. Second, the NiSi films were prepared by post-annealing process after the deposition of Ni films at the low temperature of 250 ℃. The Ni silicide films were characterized by XRD, XPS, AES, SEM, and resistivity measurements.