Growth Temperature Dependent Magnetic Properties in Epitaxial Co Thin Films

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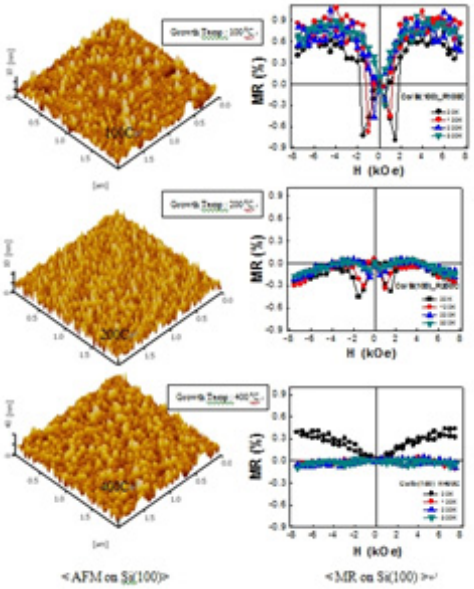
Co is one of ferromagnetic materials which has been used in real applications such as magnetic data storage, spin valve and microelectronic devices because Co plays an important role due to high spin polarization of carriers at Fermi level [1, 2] In this work, we report the magnetic properties of Co thin films grown on GaAs(100) substrates grown at RT, 100°C 200°C via molecular beam epitaxy (MBE).

Temperature dependent resistivity showed metallic behavior. The magnetoresistance (MR) measured under the out of plane magnetic field showed that a high positive transverse MR effect was observed in Co thin film grown at 100°C and reduced with the increase of growth temperature. We will discuss in detail about substrate and growth temperature dependent magnetic properties in epitaxial Co thin films.

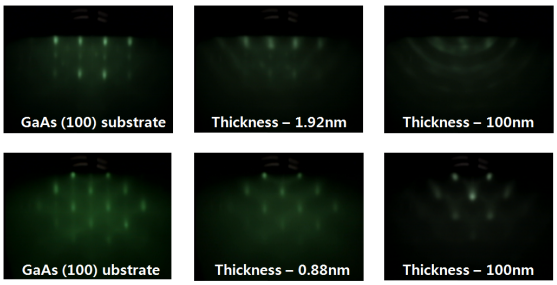
참고문헌

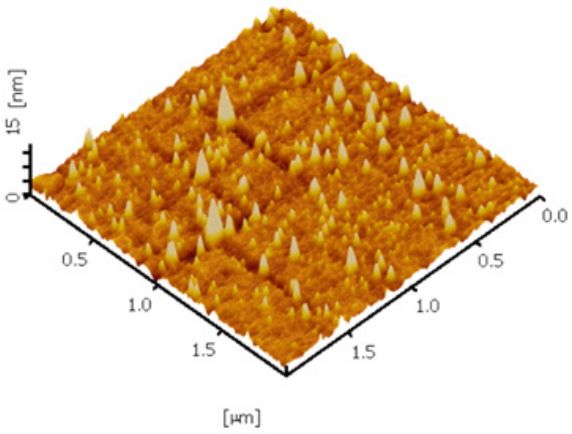
[1]. K. G. Nath, F. Maeda, S. Suzuki, Y. Watanabe, **J. Appl. Phys** 90 ,3 (2001)

[2] A. Sharma, R. Brajpuriya, S. Tripathi, D. Jain, R. Dubey, T. Shripathi, S.M. Chaudhari, **J.Mat. Sci. Eng B** 130, 120–125, (2006)



<AFM on Si(100)> <MR on Si(100)>


GaAs (100) substrate
Thickness – 1.92nm
Thickness – 100nm
GaAs (100) ubstrate
Thickness – 0.88nm
Thickness – 100nm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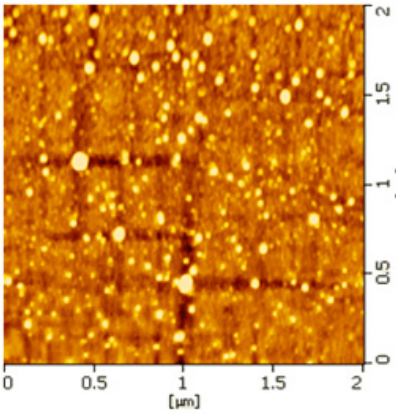
1.0
1.5
0.0
0.5
1.0
1.5
[µm]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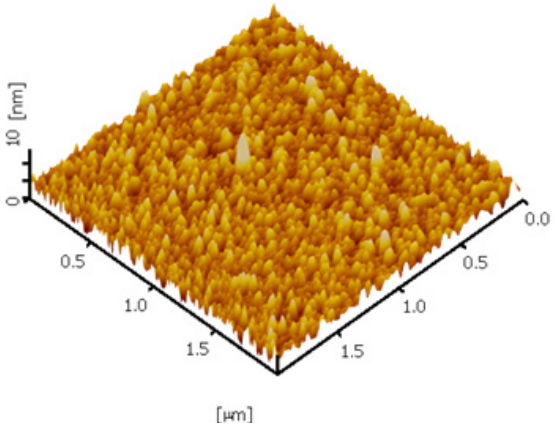
1
1.5
2
[µm]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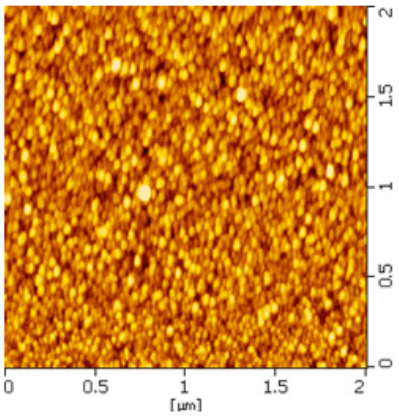
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