

## X-ray reflectivity study on the growth of Fe films on GaAs(001)

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We investigate the growth mode of Fe films on GaAs(001), varying substrate temperature from 140 K to 300 K by *in-situ* UHV x-ray reflectivity. In contrast to the previous reports, we find chemically abrupt interface between Fe and GaAs(100) by growing Fe film at 140 K<sup>(1,2)</sup>. The evolution of surface roughness with increasing Fe thickness shows growth exponent, 0.56. This indicates that growth of Fe film follows the random deposition model of 2+1 dimension without inter-diffusion, and that the diffusion kinetics is not important in the morphological evolution of Fe films at 140 K<sup>(3)</sup>. When the Fe film is annealed to 300 K, intermixing is observed at the interface between Fe and GaAs as evidenced by the formation of ultrathin heterogeneous interlayer of 0.8 nm thickness. On the other hand, surface and interface are smoothed by healing kinetics via activation of various diffusion processes.

### [참고문헌]

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