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Effect of Sb/Ga flux ratio on magnetic properties in ferromagnetic $Ga_{1-x}Mn_xSb$ random alloys[1] G.B. KIM, M. CHEON, S. WANG, H. LUO, B.D. MCCOMBE, Department of Physics, University at Buffalo, The State University of New York — For spin-functional devices involving $Ga_{1-x}Mn_xSb$, it is desirable to improve and control the magnetic properties, particularly hysteresis. We have carried out a systematic study of the effects of the Ga/Sb flux ratios, especially Sb overpressure, on the magnetic properties of these alloys. For a Mn composition of 0.023, the growth surface deteriorates outside a narrow range of Sb/Ga flux ratio. The magnetic properties of the samples, studied by SQUID magnetometry, showed a strong dependence on Sb/Ga flux ratio. Nearly square-like hysteresis loops were observed for Sb/Ga flux ratios between 4.6 and 5.3; coercive fields varied by nearly a factor of two, from 216 Oe to 380 Oe. The Curie temperature was independent of flux ratio over this range. No hysteresis was observed when the Sb/Ga ratio was increased to 5.6, when samples become superparamagnetic. The magnetotransport properties of these samples also show interesting behavior.

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Miyeon Cheon
Department of Physics, University at Buffalo, The State University of New York

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