

Abstract Submitted
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Novel method of Ge crystalline thin film deposition on SiO₂ by sputtering¹ MASAHARU SHIRATANI, DAIKI ICHIDA, HYUNWOONG SEO, NAHO ITAGAKI, KAZUNORI KOGA, Kyushu University — We are developing a novel method of Ge crystalline thin film deposition on SiO₂ by sputtering. For the method, very thin Au films were deposited on SiO₂ substrates and then Ge atoms were irradiated to the Au films by sputtering. By EDX and SEM measurements, we found two kinds of Ge film growth: one is Ge film formation on Au films for a high flux irradiation of Ge, and the other is Ge film formed between Au films and SiO₂ substrates for a relatively low flux irradiation of Ge. The latter film formation is useful to create high quality Ge crystalline films on various kinds of substrate with aligned crystal orientation and a large grain size. XRD and Raman measurements show the films are Ge crystal and the better crystallinity for the higher substrate temperature. Surface morphology depends on the substrate temperature. At 180-250C Ge islands of 50 nm in diameter are formed on surface. Smooth Au films are obtained at 320C. Au aggregates of 100 nm in diameter are formed on surface at 400C. The Ge films show a high absorption coefficient for a wide light wavelength range from 400 nm to 1100 nm and photo generated current in the same wavelength range.

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Masaharu Shiratani
Kyushu University

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