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Substrate temperature dependence of Au-induced crystalline Ge film formation using sputtering deposition SOTA TANAMI, DAIKI ICHIDA, SHINJI HASHIMOTO, Kyushu University, GIICHIRO UCHIDA, Osaka Univesity, HYUNWOONG SEO, DAISUKE YAMASHITA, KUNIHIRO KAMATAKI, NAHO ITAGAKI, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu University — We are developing Au-induced crystalline Ge film formation using sputtering deposition. For the method, very thin Au films were deposited on SiO_2 substrates and then Ge atoms were irradiated to the Au films by sputtering. We found two kinds of Ge film growth: one is Ge film formation on Au films, and the other is Ge film formed between Au films and SiO_2. The latter film formation, however, takes place in a narrow temperature range around 140°C. Here we report two kinds of substrate temperature dependence of Ge film formation: one is annealing temperature of Au films, and the other is the substrate temperature dependence during Ge sputtering. 30nm-thick Au films were deposited quartz glass as a catalyst at room temperature by sputtering. Then the Au films were annealed in a temperature range from room temperature to 190 °C in a vacuum. Au grain grows and crystal orientation shows better alignment as the annealing temperature rises. We found that the smaller grain size with random orientation is better for Ge film formed between Au films and SiO_2.

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