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Effects of N_2 dilution on fabrication of Ge nanoparticles by rf sputtering SHNJI HASHIMOTO, SOUTA TANAMI, HYUNWOONG SEO, Kyushu University, GIICHIRO UCHIDA, Osaka University, DAISUKE YAMASHITA, KUNIHIRO KAMATAKI, NAHO ITAGAKI, KAZUNORI KOGA, MASHARU SHIRATANI, Kyushu University — Multiple exciton generation (MEG) in QDs is expected to enhance significantly the energy conversion efficiency of solar cells. Although there are several reports on MEG characteristics from various QD materials such as PbS, CdSe, CdS ZnS, and Ag_2S, such materials have disadvantages of their toxicity and limited resources. Here we have developed quantum-dots (QDs) solar cells using Ge nanoparticles fabricated by rf sputtering method under high pressure. We fabricated Ge nanoparticles by rf sputtering at a pressure of 1.5 Torr. Since the mean free path of Ge atoms is an order of micrometer, and Ge nanoparticles are formed in gas phase. We fabricated Ge nanoparticles using Ar and N_2 to terminate surface defects by N. Ge and Ar emission intensities decrease significantly with increasing N_2 partial pressure. The electron density was measured with a plasma absorption probe. The electron density decreases with increasing N_2 partial pressure.

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