Abstract Submitted
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Generation of nitridated silicon particles and their thin film deposition using double multi-hollow discharges[1] GIICHIRO UCHIDA, MUNEHARU SATO, YUUKI KAWASHIMA, KENTA NAKAHARA, KOSUKE YAMAMOTO, TAKEAKI MATSUNAGA, DAISUKE YAMASHITA, HIDEFUMI MATSUZAKI, KUNIHIRO KAMATAKI, NAHO ITAGAKI, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu University — Semiconductor nanocrystals have attracted much attention as materials for multiple-exciton generation (MEG) photovoltaics. Surface modification of such nanocrystals is important to make quantum well structure for efficient MEG as well as to extract photo-generated carriers from nanocrystals. In this study, nitridated silicon particles were produced by $SiH_4/H_2/N_2$ PECVD, where generation of silicon particles and their surface nitridation were independently controlled using two multi-hollow discharges. Thin films of nitridated silicon particles were deposited by controlling the N_2 flow rate. We observed strong photoluminescence (PL) emission in an energy range of 2.0 to 2.3 eV from the thin film, which may be explained by a quantum-confinement effect of silicon particles embedded in the thin film.

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