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Down-Conversion Effect Applied to GaAs p-i-n Single Junction Solar Cell

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With the growing need of more effective energy harvesting, solar energy has been sought as one of the prominent candidates among the eco-friendly methods. Although many types of solar cells have been developed, the electronic conversion efficiency is limited by the material's physical properties: solar cells can only harvest solar energy from limited range in solar energy spectrum. To overcome this physical limit, we approached by using the down conversion effect, transforming the high energy photons to low energy photons, to the range the designated solar cell can convert to electronic energy. In our study, we have fabricated GaAs single junction solar cells and applied CdSe quantum dots for down-conversion. We examine the effects of such application on the solar cell efficiancy, fill-factor, JSC, VOC, etc.

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Keywords: Downconversion, Solarcell, GaAs, Single-junction

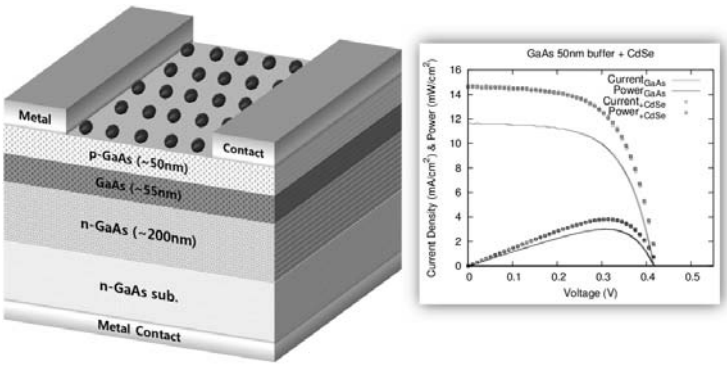

Fig. 1. CaAS p-i-n 태양전지에 CdSe 양자점 도포결과 (한국과학기술연구원作).