# 패터닝된 SiO2를 이용한 비정질/결정질 이종 접합 태양 전지 제작

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# Fabrication of amorphous Si/crystalline Si heterojunction solar cells on the patterned $SiO_2$

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**Key words** : heterojunction solar cell (이종접합 태양전지), amorphous/crystalline Si (비정질/결정질 실리콘), $SiO_2$ passivation (실리콘 다이옥사이드 패시베이션)

**Abstract** : Amorphous silicon (a-Si:H)-crystalline silicon (c-Si) heterojunction solar cells have attracted much attention because of their various advantages, such as simple fabrication steps, low process temperatures and a high thermal stability. Due to these advantages, they are considered as an alternative for diffused p-n junction solar cells based on crystalline Si wafer. We report on the electrical and optical characteristics of amorphous Si (n type) /crystalline Si (p type) heterojunction solar cells with a patterned $SiO_2$ layer at the interface. The solar cells with patterned $SiO_2$ showed improved electrical properties, having a smaller leakage current and a larger shunt resistance. The electrical conduction of the patterned samples followed the diffusion dominant process, but the control samples without patterning showed the recombination dominant process in the space charge region. The patterned samples showed an increased spectral response in the infrared region, but a decreased response in the visible region. The patterned solar cells showed an improved efficiency with a larger fill-factor but smaller open-circuit voltage and short-circuit current.

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