

비정질/결정질 이중접합 태양전지 에미터 및 후면전계층 최적화 연구

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이중접합 구조의 태양전지는 에미터 및 후면전계층으로 비정질 실리콘이 이용되고 있다. 본연구에서는 HWCVD를 이용하여 중성층 비정질 실리콘을 증착(10nm), 패시베이션된 n형 결정질 실리콘을 기판으로 PECVD법으로 에미터 층은 p형 비정질 실리콘을 후면 전계층은 n+형 비정질 실리콘을 증착하여 a-Si:H(p)/c-Si(n)/a-Si:H(n+)의 구조로 에미터 및 후면전계층의 조건에 따른 이중접합 태양전지를 제작, 특성을 분석하였다. 증착시간에 따라 에미터와 후면전계층의 두께를 조절하고 도펀트 가스(B₂H₆, PH₃)의 유량에 따라 도핑 농도를 조절하였다. 공정 변수마다 MCLT 및 Implied Voc를 측정하였고, 태양전지 제작 후 도핑 농도에 따른 충진율을 비교, 분석하였다.

Key words : hetero-junction solar cell(이중접합 태양전지)

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사무용 건축물의 자연채광 설계 및 시공사례 연구

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A case study on design and construction of daylighting system of office building.

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Throughout history, daylight has been a primary source of lighting in buildings, supplemented originally with burned fuels and more recently with electrical energy. Before daylight was supplemented or replaced with electric light in the late 19th-century, consideration of good daylight strategies was essential. As we entered the mid-20th-century, electric light supplanted daylight in buildings in many cases. Fortunately, during the last quarter of the 20th-century and early years of this century, architects and designers have recognized the importance and value of introducing natural light into buildings.

There are many simple strategies that can enhance daylighting and reduce the need for electric lights. Good quality daylight is always welcome, but remember that the electric lights must be dimmed or shut off in order for daylighting to save energy.

We designed and built mirror systems and vertical daylighting devices to improve daylight condition of office buildings in bad condition because urban density is getting higher. This case study aims to analysis the principles and characteristics of mirror systems and vertical daylighting devices and selected the method that can improve constructability. The results of this study are going to use the back data to set-up the design standards. Hereafter we're going to progress the performance test and product the design manual to improve applicability of daylighting systems at design phase.

Key words : Daylighting System(자연채광장치), Mirror System(반사거울시스템), Sun Pipe(수직채광장치), Heliostat(헬리오스타트)

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