Type II 이종접합 나노구조체를 이용한 하이브리드 태양전지 제작

*이 현주[1], 박 성은[2], 박 정희[3], 임 희진[4], **김 동환[5]

Hybrid Solar Cells Based on Type II Heterojunction Nanostructures

*Hyunju Lee, Sungeun Park, Jeunghee Park, Heejin Lim, **Donghwan Kim

Key words : Type II heterojunction(Type II 이종접합), CdTe/CdSe(텔루륨화 카드뮴/셀렌화 카드뮴), Hybrid solar cell(하이브리드 태양전지), Pseudoindirect transition(유사간접천이).

Abstract : We report a facile one-pot synthetic method for the formation of CdTe/CdSe tetrapod nanocrystals with type II band alignment. The crystal growth kinetics can be controlled by changing the injection temperature, rate and concentration of the chalcogen precursor, allowing the structure of CdTe/CdSe tetrapod nanocrystals to be synthesized without changing the underlying chemistry. The nanocrystals were characterized by transmission electron microscopy, high-resolution transmission electron microscopy, energy dispersive spectrometry and X-ray diffraction analysis. The heterostructure nanocrystals are composed of a CdTe tetrapod core and CdSe nanorod tips, showing optical properties typical of type-II heterostructures that is well suited for photovoltaic applications. At this early stage, the efficiency of solar cells based on P3HT and prepared nanocrystals remains low (~0.01%), but optimization of device composition, morphology, and annealing would enhance the solar cell performance.

1) Department of Materials Science and Engineering, Korea University.
E-mail : lhjera@korea.ac.kr
Tel : (02)3290-3816 Fax : (02)3290-4784
2) Department of Materials Science and Engineering, Korea University.
E-mail : logos0329@empal.com
Tel : (02)3290-3713 Fax : (02)3290-4784
3) Department of Chemistry, Korea University.
E-mail : parkjh@korea.ac.kr
Tel : (02)3290-3973 Fax : (02)3290-3992
4) Department of Materials Science and Engineering Korea University.
E-mail : hynuri@korea.ac.kr
Tel : (02)3290-4791 Fax : (02)3290-4784
5) Department of Materials Science and Engineering Korea University.
E-mail : donghwan@korea.ac.kr
Tel : (02)3290-4791 Fax : (02)3290-4784