Solution Processed All-Inorganic Solar Cells Using CdTe Quantum Dots and Tetrapods

김현경[1,2], 임재훈[3], 이동구[3], 박고운[4], 이성훈[4], 이창희[3],
차국헌[5,2,*]
[1]서울대학교 화학생물공학부 지능형유도조합체 창의연구단; [2]서울대학교 화학생물공학부
WCU 에너지환경화학융합기술전공; [3]서울대학교 전기공학부; [4]서울대학교 화학부;
[5]서울대학교 화학생물공학부 지능형유도조합체 창의연구단
(khchar@plaza.snu.ac.kr*)

CdTe thin film solar cells have drawn strong interest in industry due to its simplicity in chemical composition with proper bandgap along with high absorption coefficient and power conversion efficiency. However, conventional processes to realize CdTe thin films requires long fabrication time and energy consumption, thus increasing production cost. In this presentation, we demonstrate CdTe solar cells using shape-controlled CdTe nanocrystal inks for economic solution processing. To form large and directional CdTe grains, we employed binary CdTe nanocrystal inks that contain both spherical and tetrapod-shaped nanocrystals and sinter the blend film at elevated temperature. The influence of sintering temperature, blending ratio, and the size of nanocrystals on the growth of CdTe grains were examined by UV-visible absorption spectroscopy, X-ray diffraction, and scanning electron microscopy. We also investigated the relationship between grain size/orientation and solar cell performance.