



김민철 교수

기계공학부

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연구분야

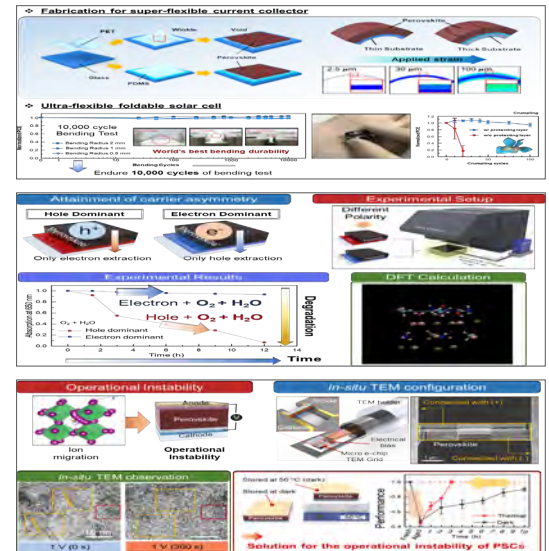
Renewable Energy Devices  
Flexible Nano Devices  
Advanced Nano Characterization

수상

Best Poster Presentation Award, Material Research Society(USA), 2017

## 대표연구

- Ultra-flexible Energy Harvesting Devices
  - Film deposition on 2.5  $\mu\text{m}$  ultra-thin substrate
  - Bending durable solar cells up to 10,000 times
  - Foldable/crumpling durable perovskite solar cells
- Solution for Instability of Perovskite Solar Cells
  - Chemical instability of perovskite materials
  - Trapped charge polarity effect on perovskite
  - Molecular dynamic simulation based on DFT
- Advanced Characterization for Nano Materials
  - In-situ TEM observation under electrical bias
  - FIB assisted thin film lamella fabrication
  - Thermal assisted recovery of perovskite solar cells

주요  
연구실적

- Ultra-flexible perovskite solar cells with crumpling durability: toward a wearable power source, Energy & Environ. Sci., IF: 38.532, JCR <1%, 2019
- Advanced characterization techniques for overcoming challenges of perovskite solar cell materials, Adv. Energy Mater., IF: 29.368, JCR <3%, 2020
- Imaging real-time amorphization of hybrid perovskite solar cells under electrical biasing, ACS Energy Lett., IF: 23.101, JCR <5%, 2021
- Moth-eye structured polydimethylsiloxane films for high-efficiency perovskite solar cells, Nano-Micro Lett., IF: 16.419, JCR <10%, 2019
- Degradation of  $\text{CH}_3\text{NH}_3\text{PbI}_3$  perovskite materials by localized charges and its polarity dependency, J. Mater. Chem. A, IF: 12.732, JCR <10%, 2019

주요  
연구과제

- 고효율 유무기 페로브스카이트 자가 광충전 태양광 배터리 개발, 한국연구재단, 2019.09~2020.08, 4천5백만원 (페로브스카이트, 태양전지, 이차전지)

학회  
회원

- American Chemical Society(ACS) member(2020~현재)
- Materials Research Society(MRS) member(2016~현재)