

ペロブスカイト (MAPbBr_xI_{3-x}) 太陽電池

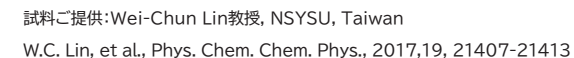


Figure 1 displays three energy level diagrams for the samples, showing the relative positions of the HOMO, LUMO, and Evac levels, along with the band gap and ionization potential. The y-axis represents Energy level (eV).

- 新品 (New Sample):** The HOMO level is at 0 eV. The LUMO level is at 2.6 eV. The band gap is 2.6 eV. The ionization potential is 6.0 eV. The electron affinity is 3.4 eV.
- 加熱後 (After Heating):** The HOMO level is at 0 eV. The LUMO level is at 2.6 eV. The band gap is 2.6 eV. The ionization potential is 5.8 eV. The electron affinity is 3.2 eV.
- UV照射後 (After UV Irradiation):** The HOMO level is at 0 eV. The LUMO level is at 6.0 eV. The band gap is 6.0 eV. The ionization potential is 6.8 eV. The electron affinity is 0.8 eV.

Legend:

- E_{VAC} : 真空準位 (Vacuum level)
- E_F : フェルミエネルギー (Fermi energy)
- HOMO: 最高被占分子軌道 (Highest occupied molecular orbital)
- LUMO: 最低空分子軌道 (Lowest unoccupied molecular orbital)

* LEIPSから電子親和力が、UPSからイオン化ポテンシャルと、フェルミ準位を基準としたHOMOのエネルギー位置がわかります。これらの情報からバンドギャップが算出されます。

デバイスの劣化を議論する上で、
エネルギー準位の情報は重要な指標！

LEIPS: 低エネルギー逆光電子分光法 * H.Yoshida, *Chem. Phys. Lett.* 539-540, 180(2012)