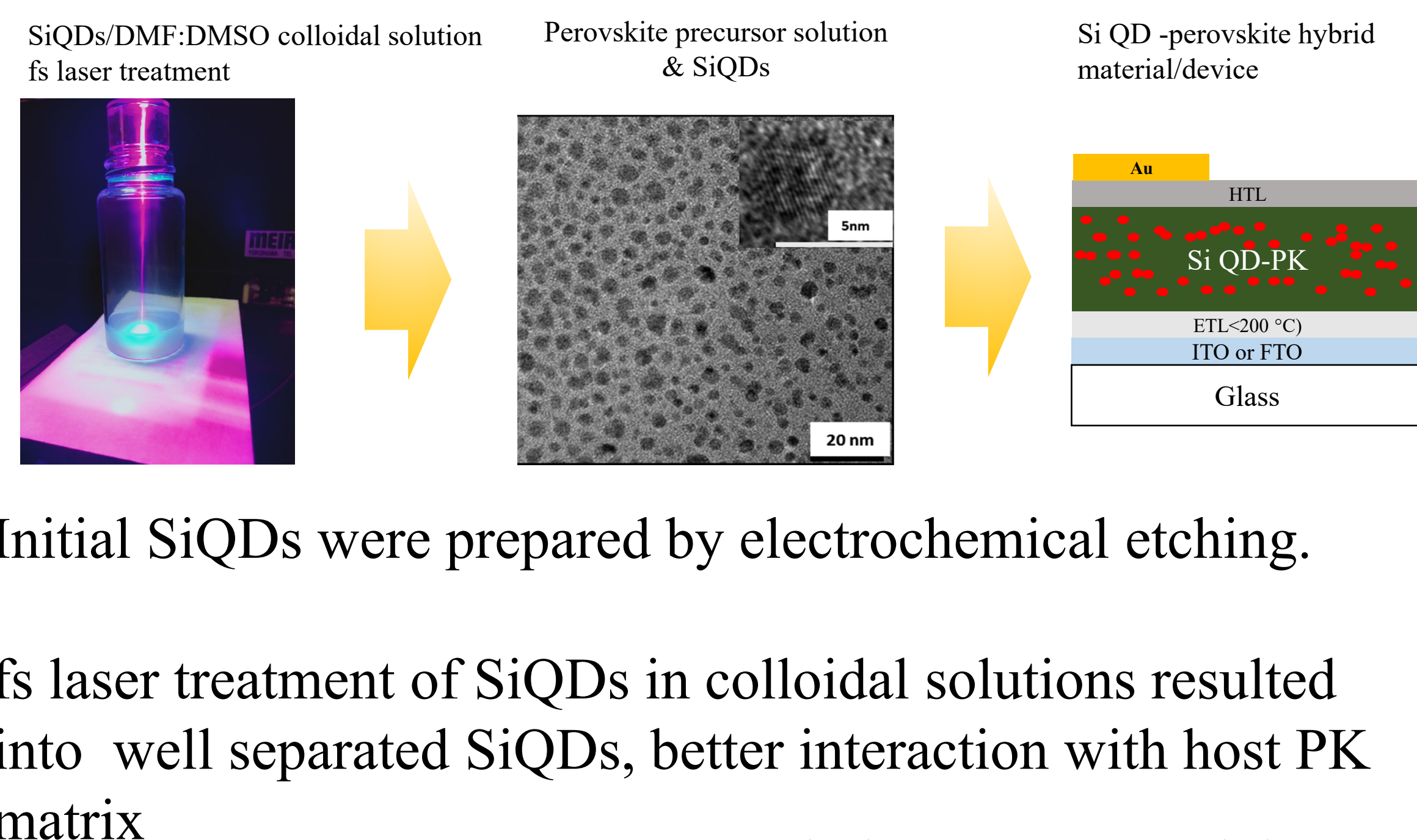


Silicon quantum dots and perovskites hybrid solar cells

研究の目的

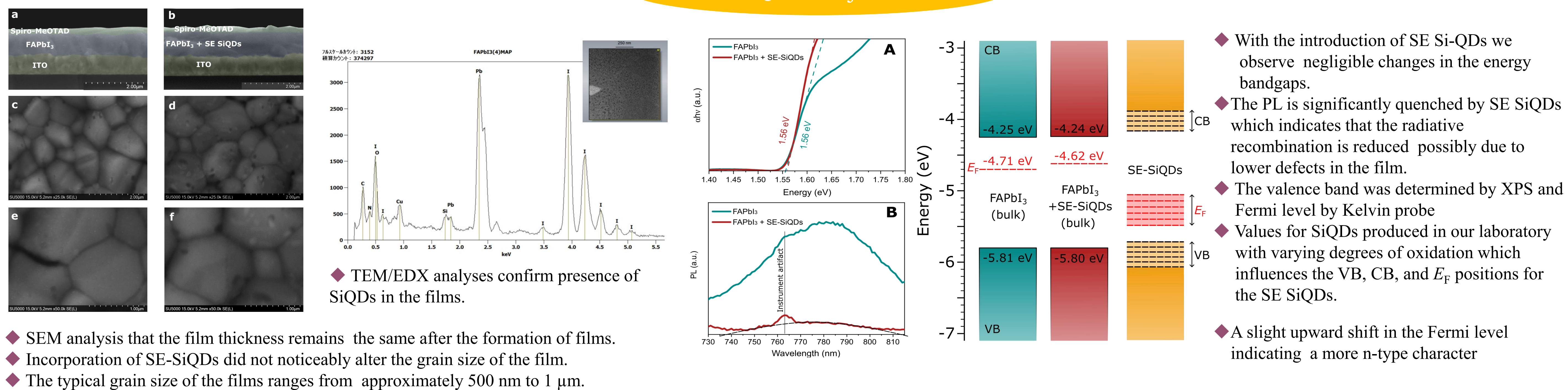
- ◆ Formamidinium Lead Iodide (FAPbI₃) perovskite (PK) limiting of thermally unstable methylammonium (MA).
- ◆ The performance of PK with FAPbI₃ the fs laser engineered silicon quantum dots (SiQDs) increased initial solar cell performance.
- ◆ The role of SiQDs in PK solar cell stability.

実験

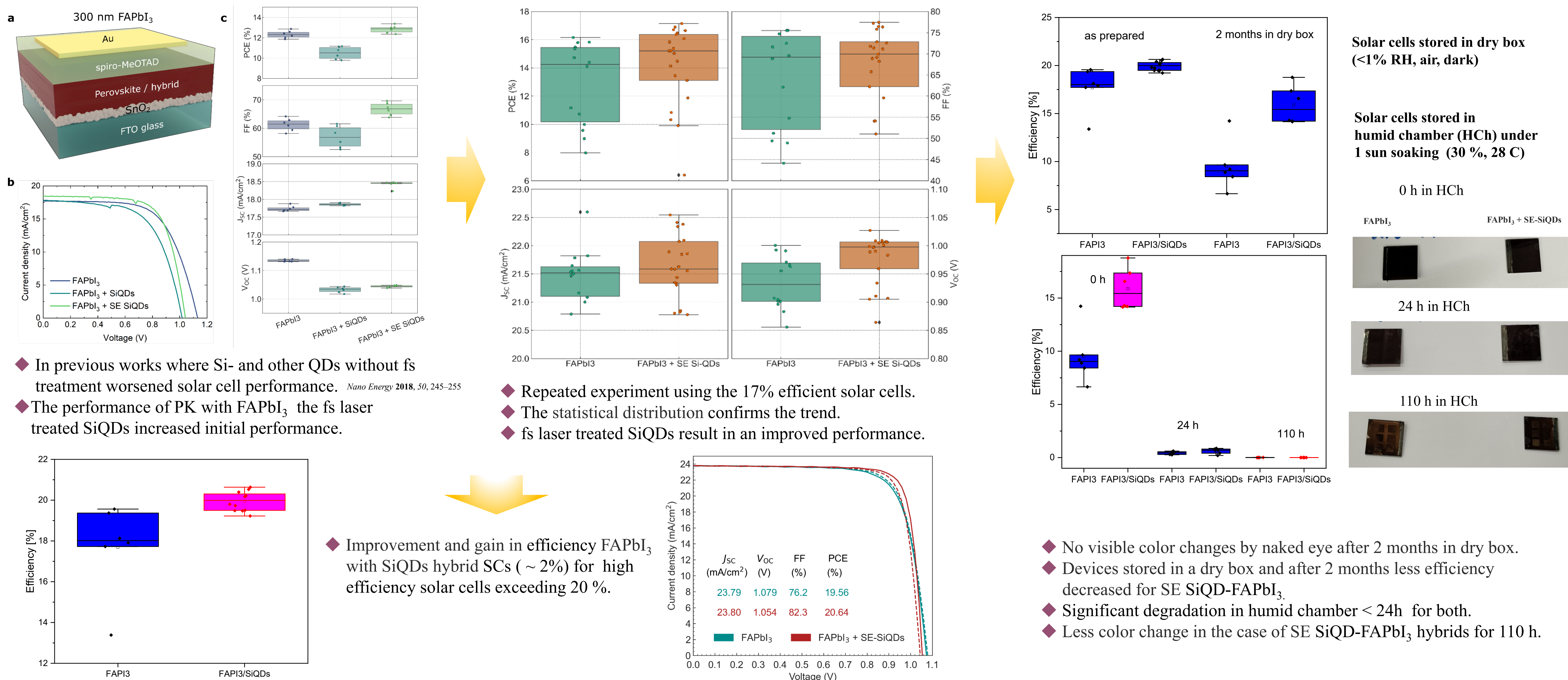


結果 & 考察

Si QDs/FAPbI₃ films



Si QDs/FAPbI₃ Solar cells



結論

- ◆ Hybrid solar cells based on SE SiQDs in limiting of thermally unstable methylammonium in formamidinium lead iodide (FAPbI₃) perovskites.
- ◆ Characteristics of SE SiQDs / FAPbI₃ hybrid films
 - * The introduction of the SE-SiQDs does not impact the morphology, film thickness, energy gap.
 - * The PL is quenched indicates that the radiative recombination is reduced possibly due to lower defects in the film.
 - * Fermi level shifts (n type, negative built-in charges in SE-SiQDs).
- ◆ Characteristics of SE SiQDs / FAPbI₃ hybrid solar cells (SCs)
 - * SE SiQDs increase the overall power conversion efficiency SCs (~2% in average).
 - * Improved device stability not enough (pronounced degradation in humid chamber)