

CdS or CdSe Decorated TiO₂ Nanotube Arrays from Spray Pyrolysis Deposition: Use in Photoelectrochemical Cells



Sungkyunkwan University
Jong Hyeok Park

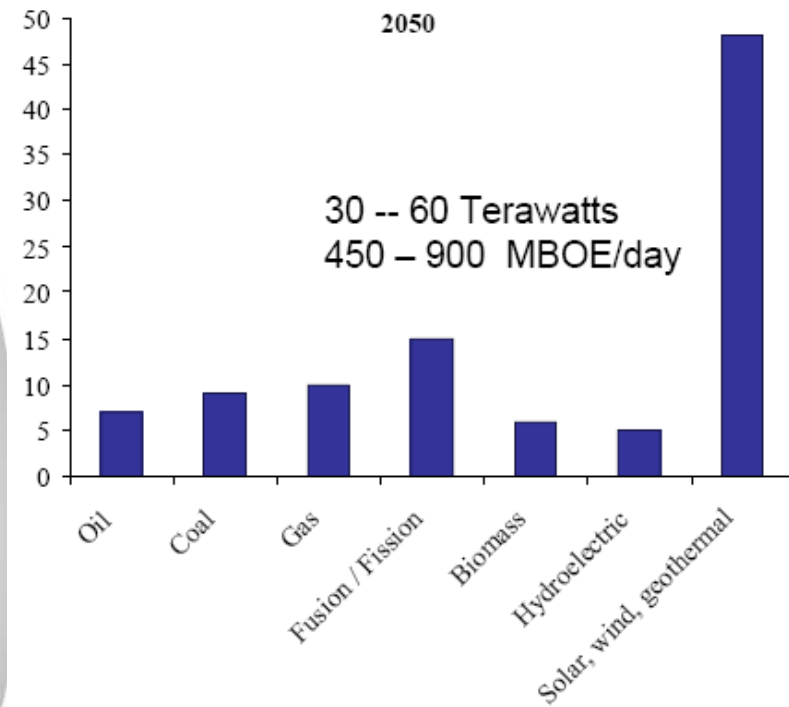
● Solar Resource



165,000 TW of Sunlight hit the earth



Additional Energy about 30 TW
should be produced until 2050

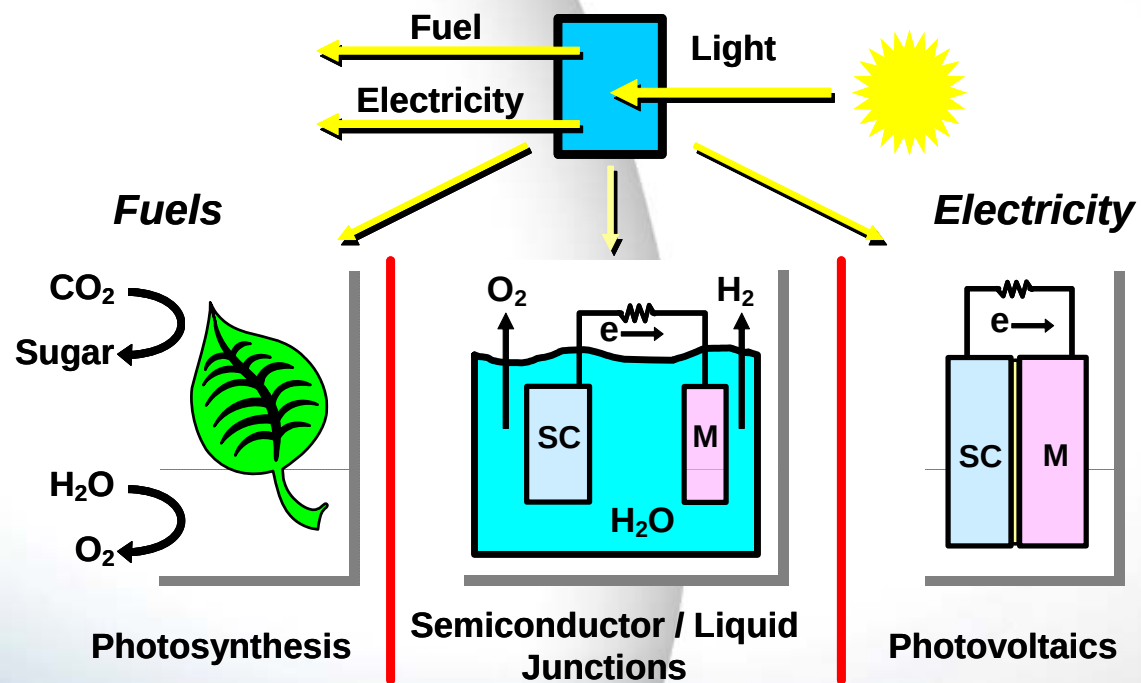


**One of Possible Strategies:
Solar Energy**

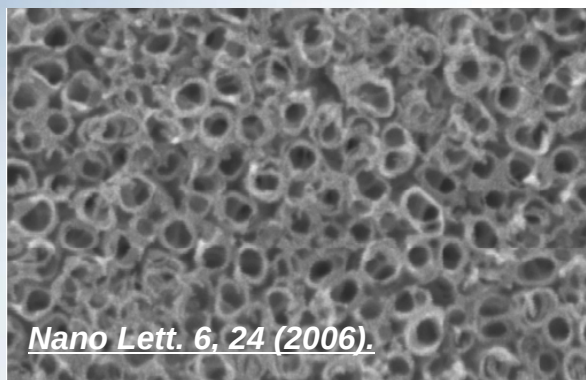
Energy Conversion Strategies



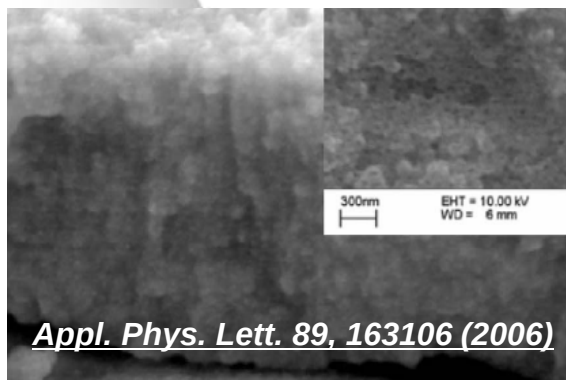
Energy Conversion Strategies



Nanostructured Materials



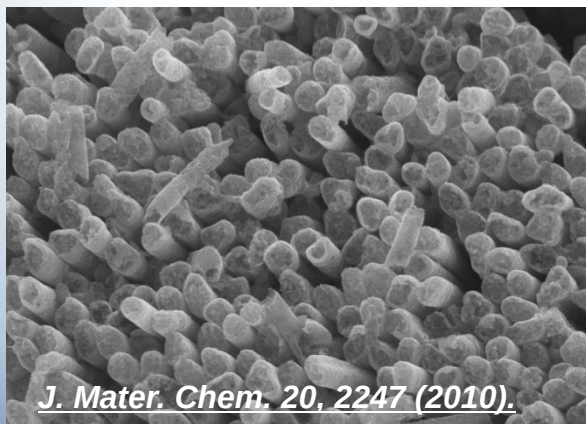
Nano Lett. 6, 24 (2006).



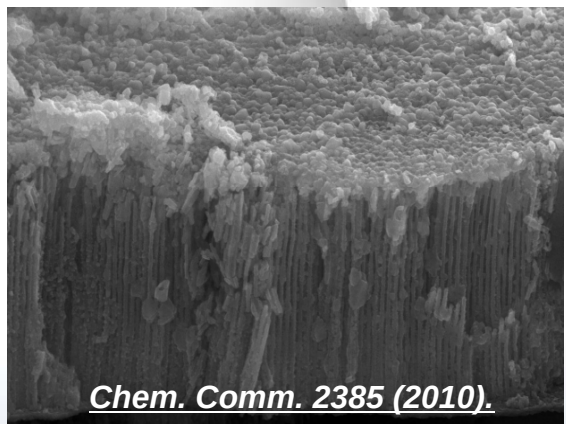
Appl. Phys. Lett. 89, 163106 (2006)



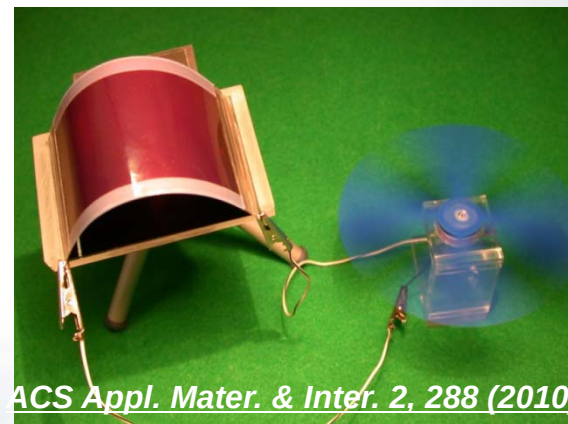
Chem. Comm. 2867 (2008).



J. Mater. Chem. 20, 2247 (2010).

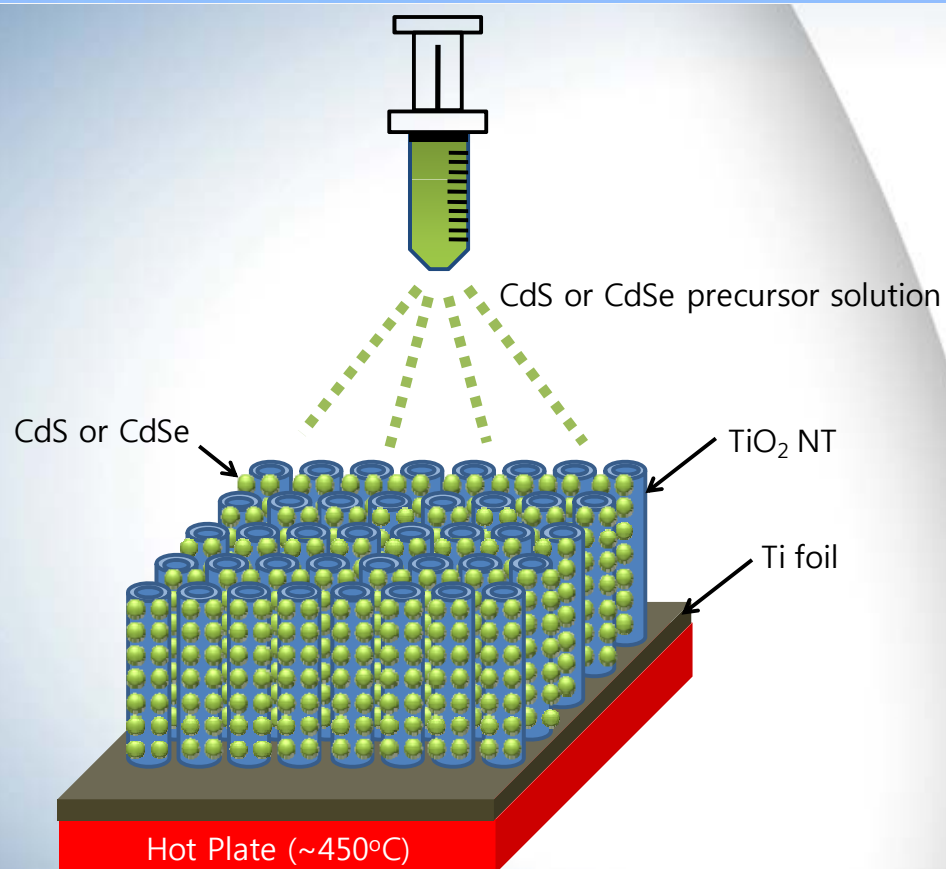


Chem. Comm. 2385 (2010).



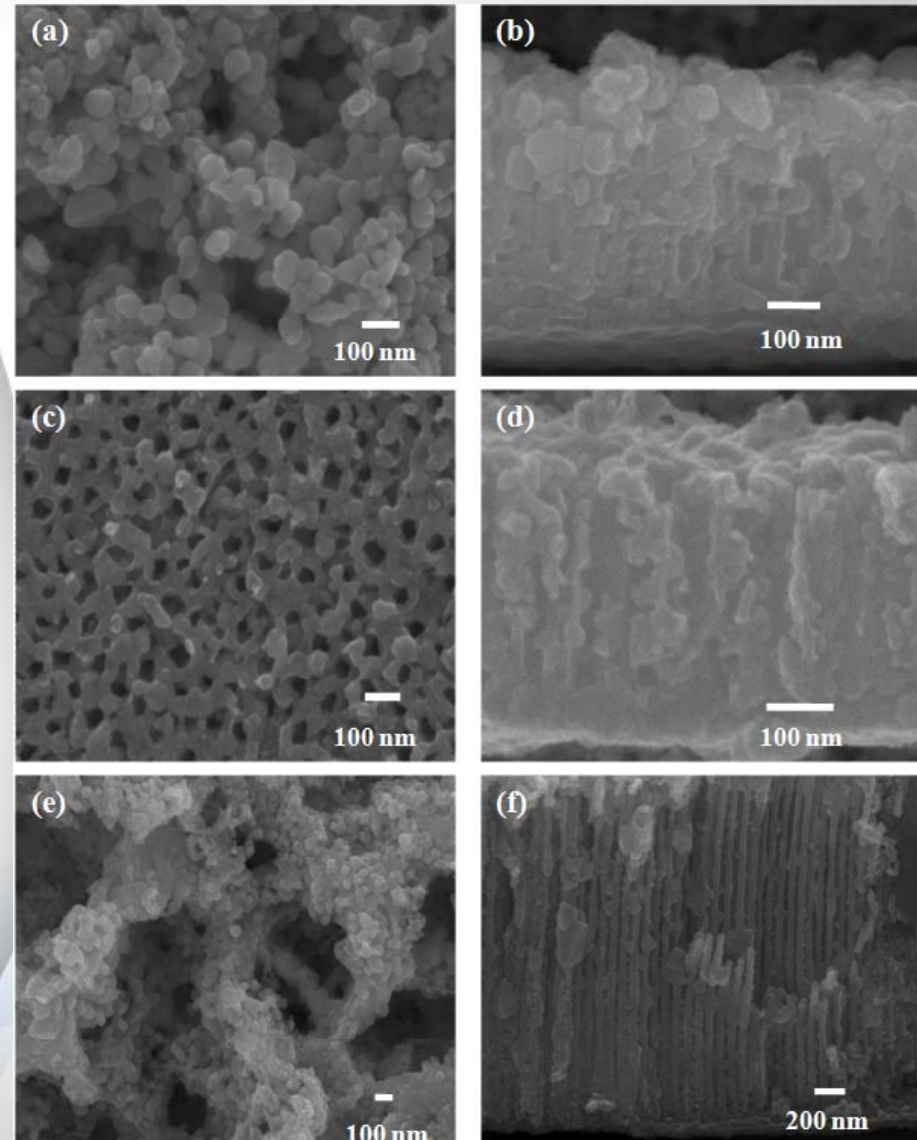
ACS Appl. Mater. & Inter. 2, 288 (2010).

In My Poster: QDs Coated TiO₂ NTs

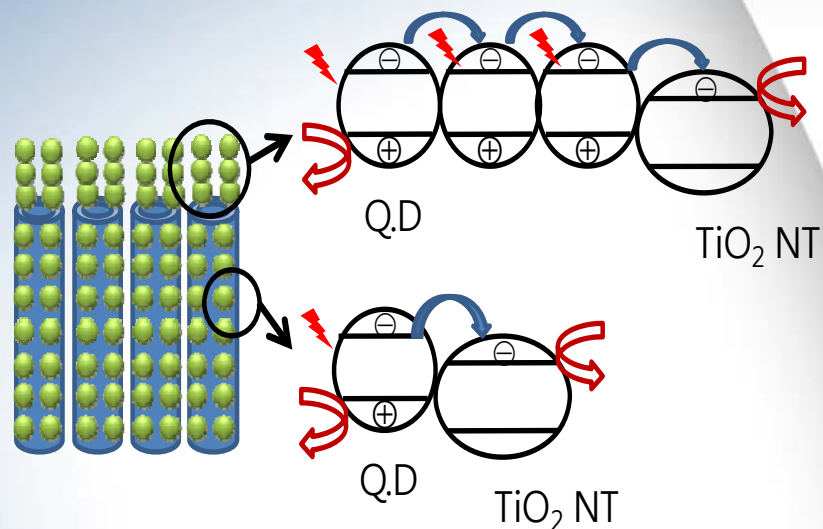


Spray Pyrolysis Method:

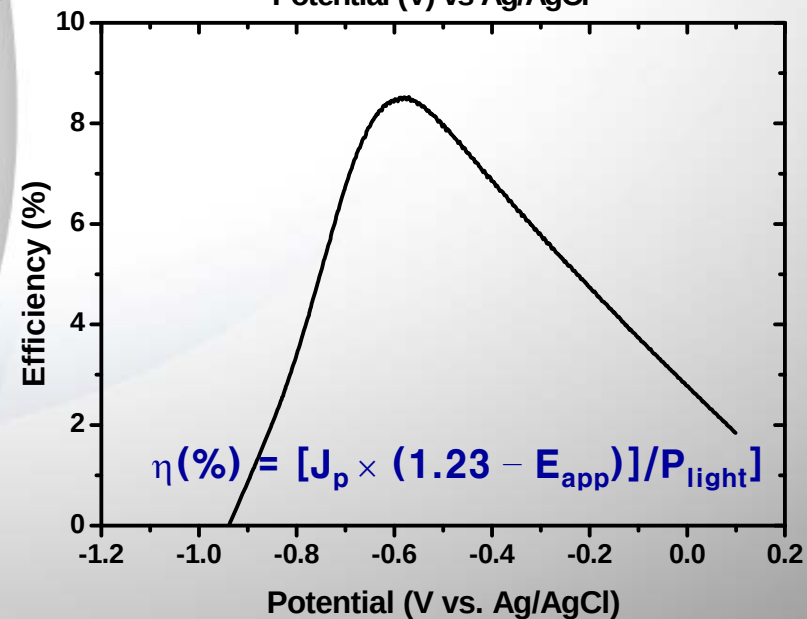
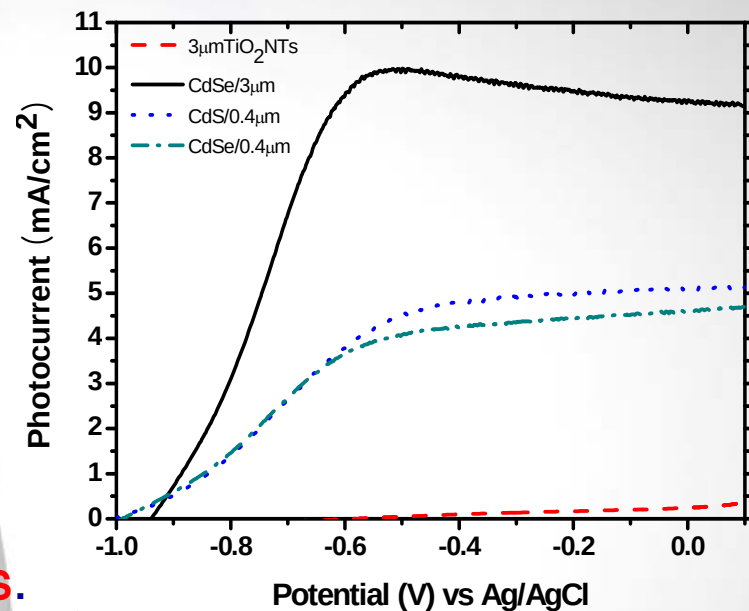
1. Simple
2. Suitable for large area coating
3. Precursor solution spray during thermal annealing of substrates

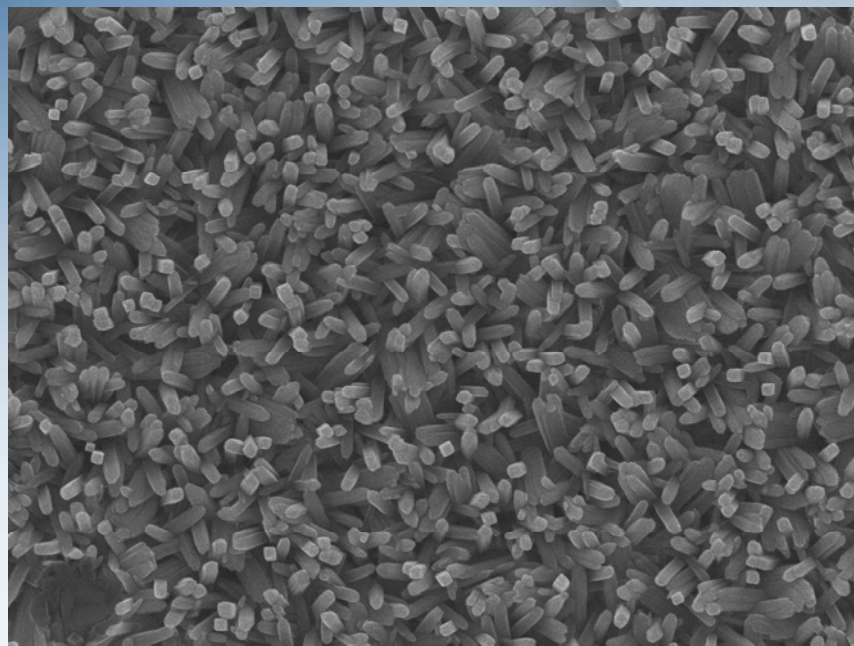


Analysis of Mechanism: High Current Density

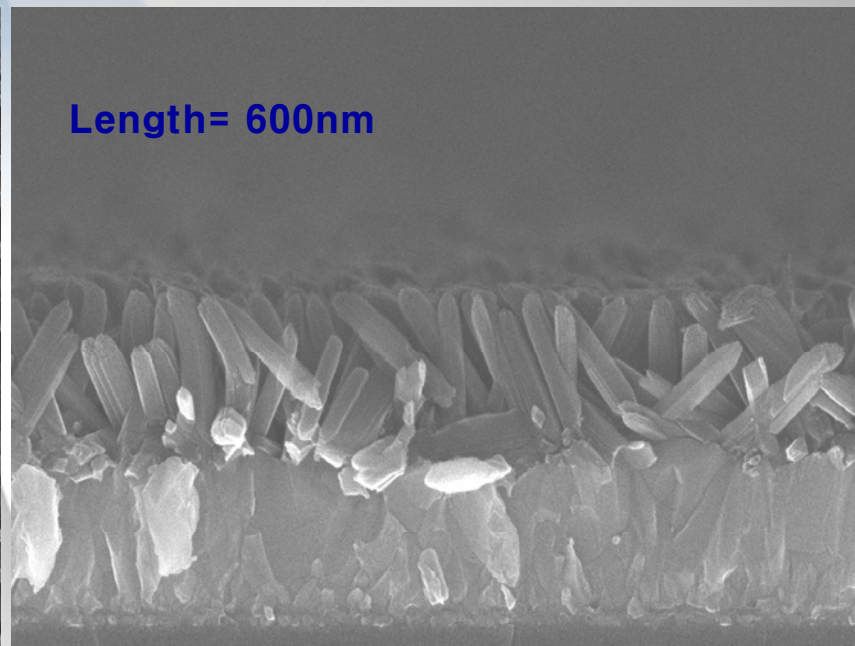


Aqueous solution: 0.35 M Na₂SO₃ + 0.24 M Na₂S.



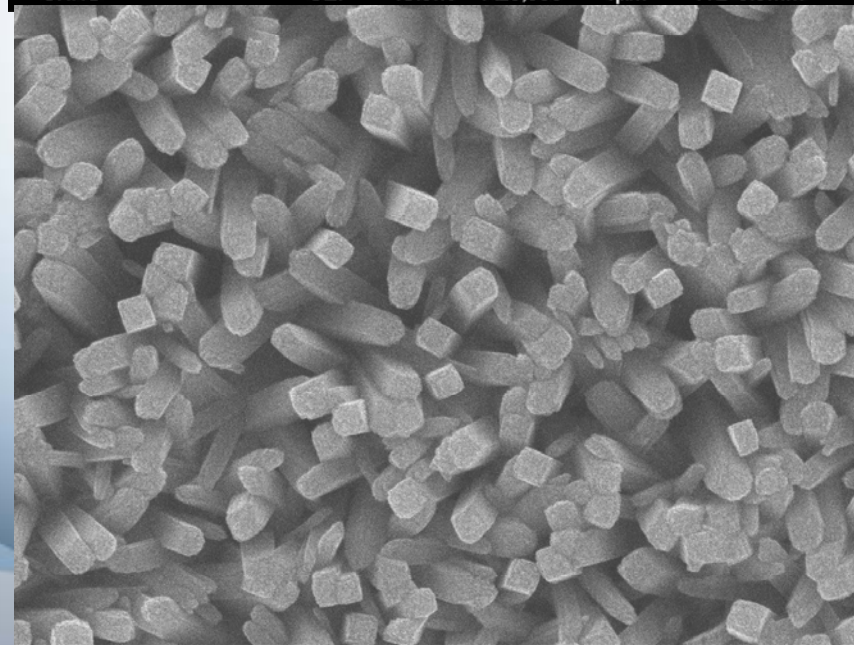


SKKU SEI 15.0kV X20,000 1 μ m WD 8.0mm



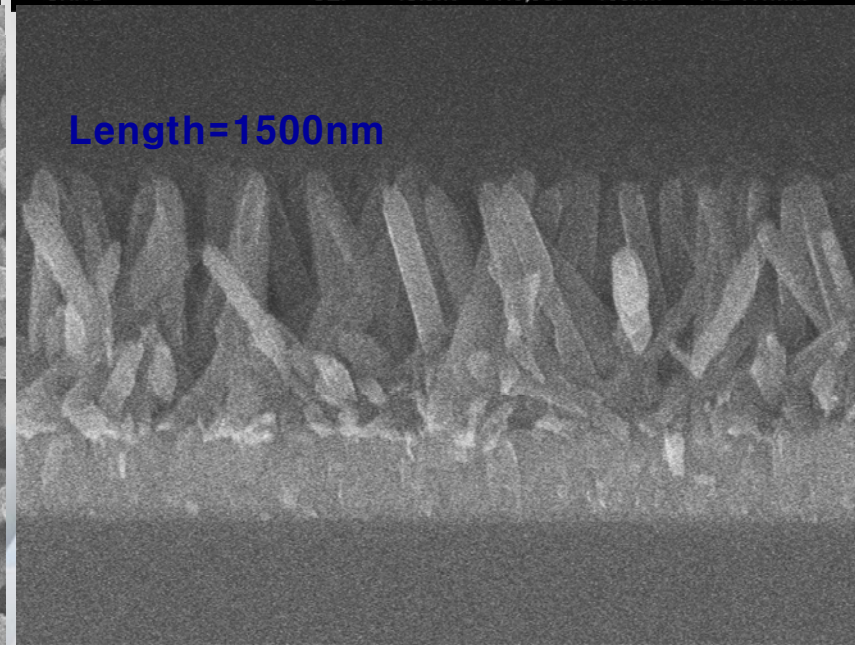
Length= 600nm

SKKU SEI 15.0kV X40,000 100nm WD 7.1mm



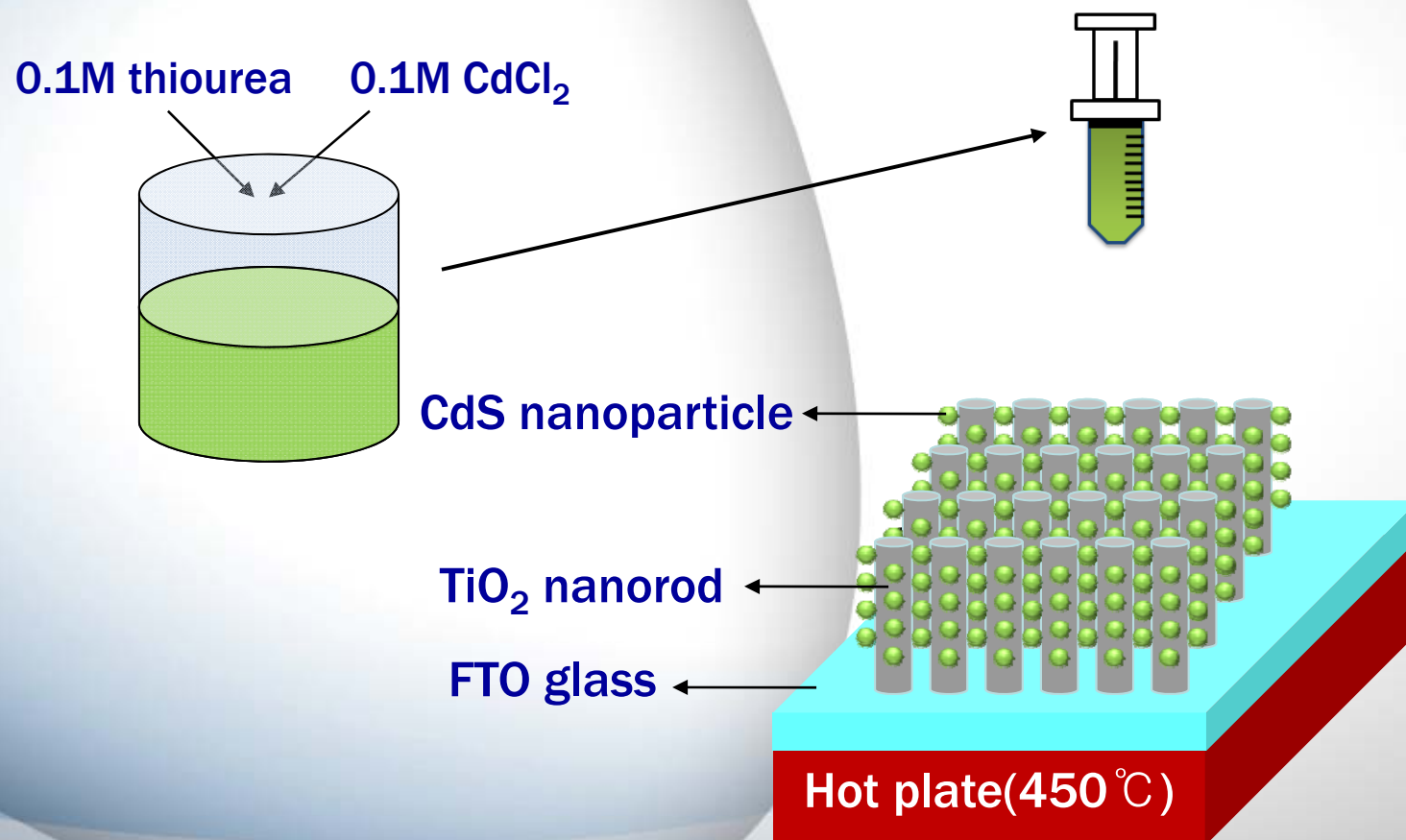
Length=1500nm

SKKU SEI 15.0kV X30,000 100nm WD 6.7mm

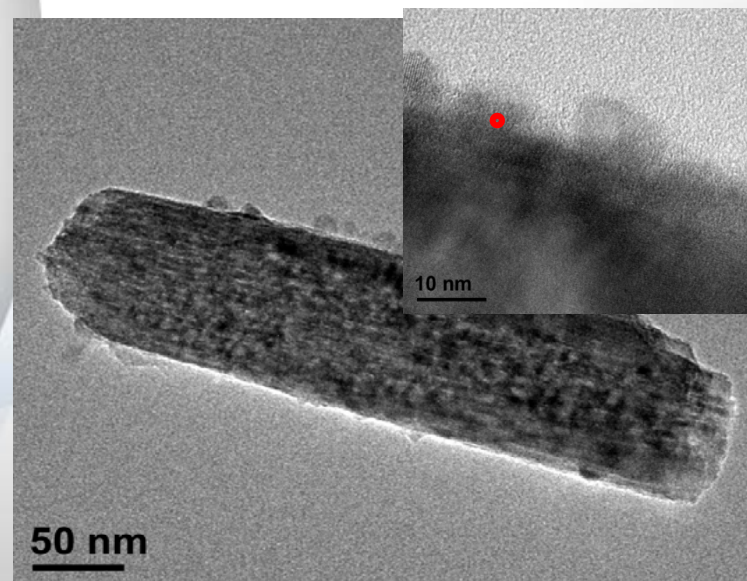
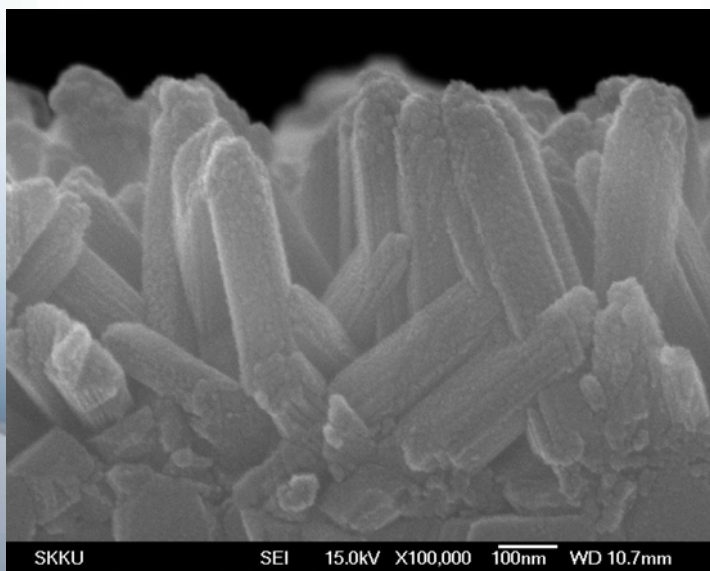
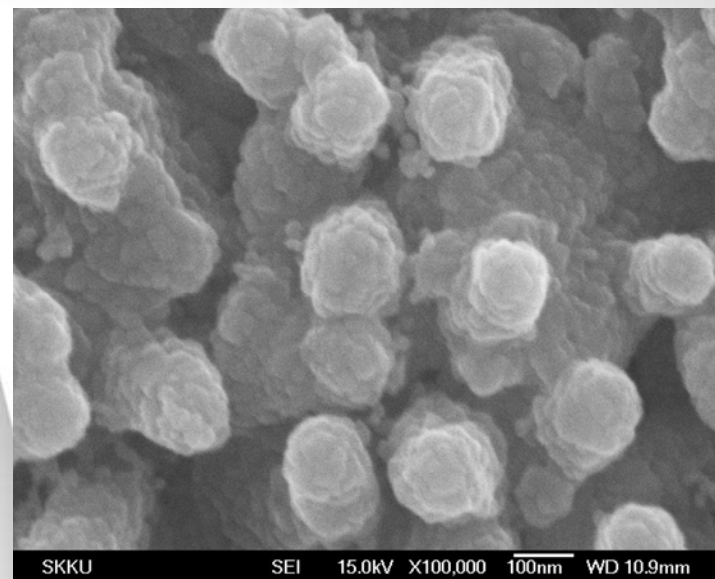
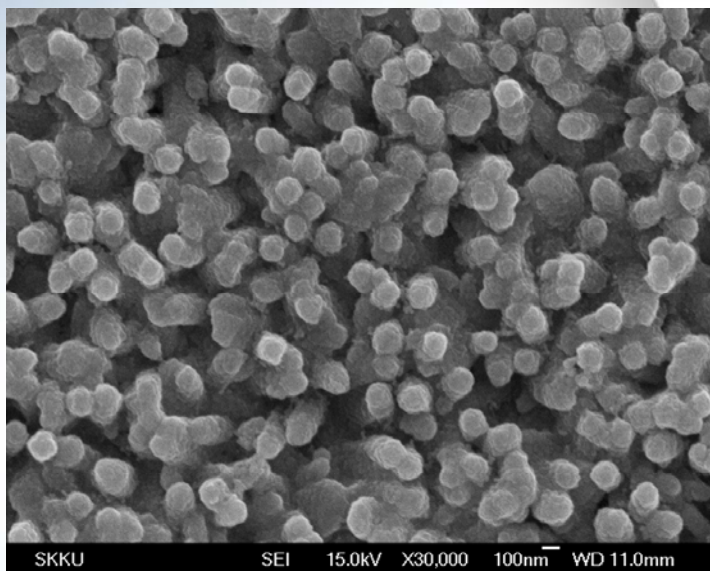


SKKU SEI 15.0kV X23,000 1 μ m WD 6.4mm

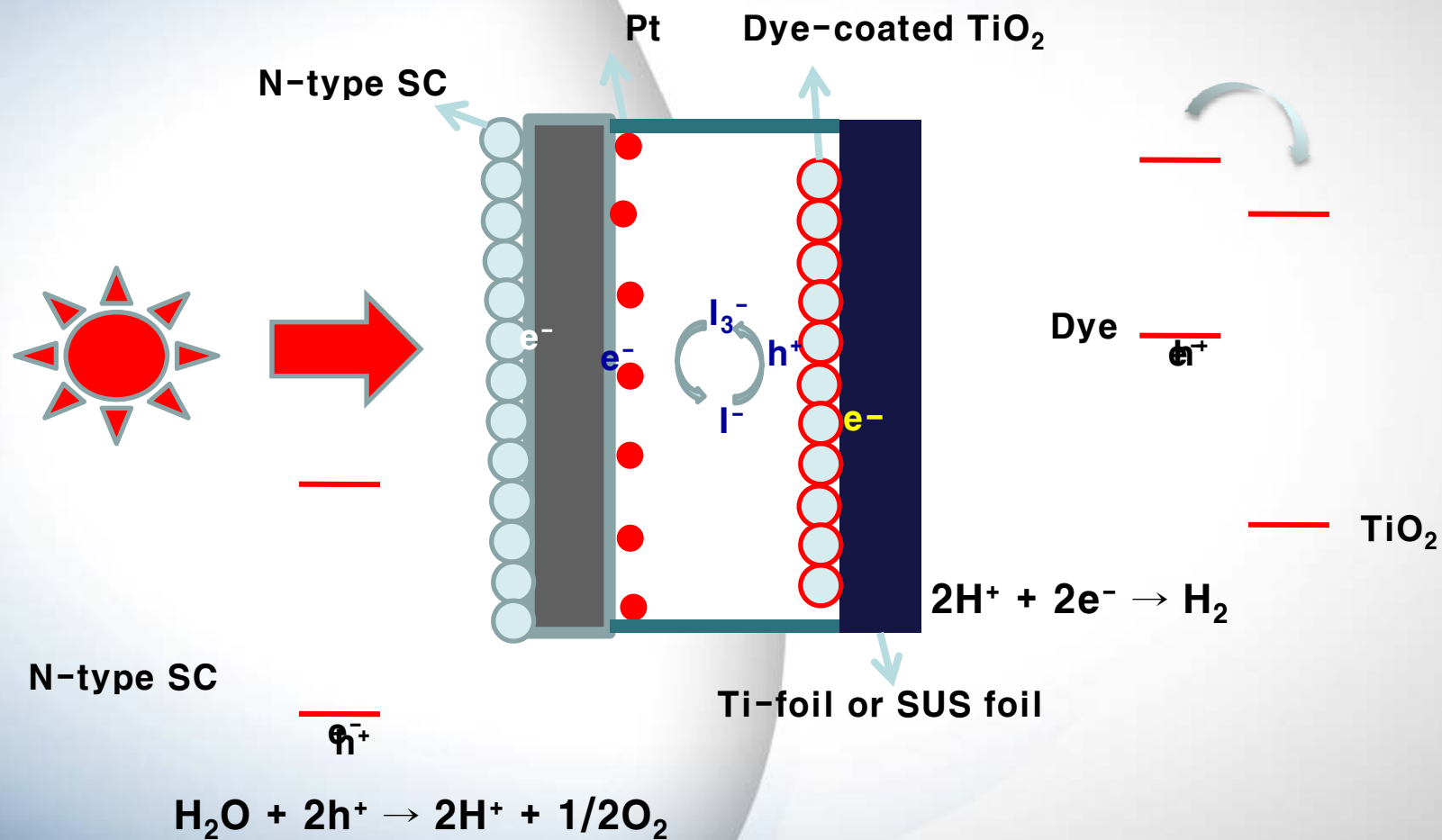
CdS NPs coupled TiO₂ NRs - SPD

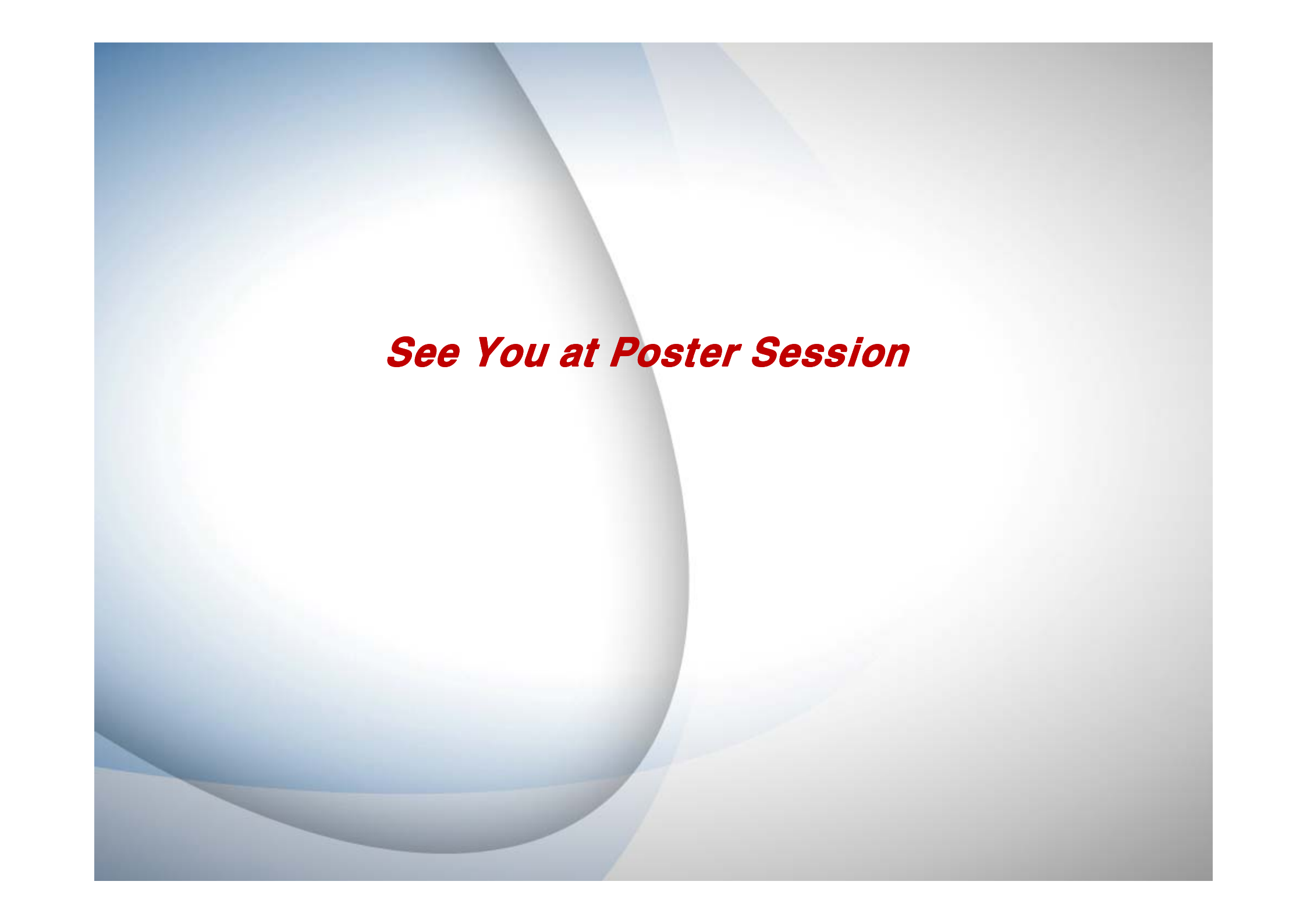


● CdS NPs coupled TiO₂ NRs – SPD



Unassisted Water Splitting





See You at Poster Session