A2-3
Development of large-scale photoelectrode, bias-power and water splitting system, using solar light

We obtain Hydrogen from large scale PEC water splitting with large-scale photo-electrode and bias-power solar cell.

- High efficient large-scale photoelectrode
- Bias-power solar cell
- Low voltage & high current power matching
- PEC unit system for H_2 generation

Goal

Development of large-scale photoelectrode, bias-power and water splitting system for H_2 generation, using solar light

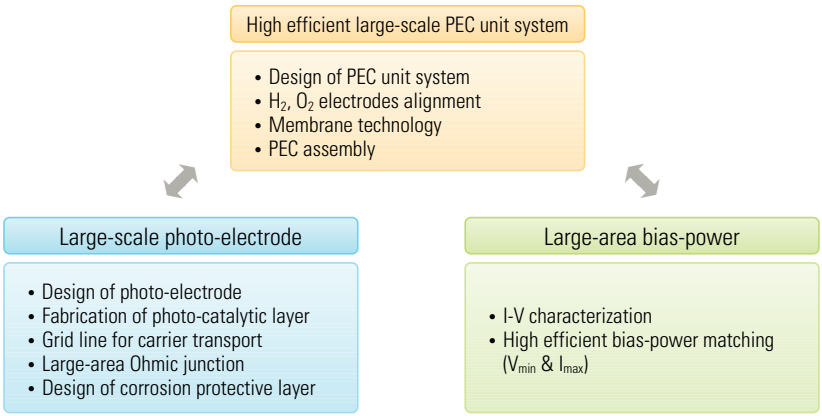
- Development of high efficient large-scale photoelectrode
- Development of bias-power solar cell
- Design and manufacture of PEC unit system for H_2 generation

Objective

- 1st year
  - Design and manufacture of photoelectrode for H_2 generation and water splitting system (1 cm x 10 cm x10 cm)
  - Photoelectrode efficiency (2%)
- 2nd year
  - Design and manufacture of photoelectrode for H_2 generation and water splitting system (10 cm x 10 cm)
  - Photoelectrode efficiency (2%)
- 3rd year
  - Design and manufacture of photoelectrode for H_2 generation and water splitting system (15 cm x 15 cm)
  - Small scale photoelectrode efficiency (3.5%)
- 4th year
  - Design and manufacture of photoelectrode for H_2 generation and water splitting system (1 m x 1 m)
  - Small scale photoelectrode efficiency (5%)

Won Jae LEE
Energy-conversion devices center
Applied Electric materials Department
KERI
E-mail : wjlee@keri.re.kr
Participants : KERI, Sejong Univ.
Researchers : 11 persons (KERI 6, Univ. 5)

Strategy



Outcomes & benefits

- Securing cost-effective technology of H_2 production system
- Supporting the introduction of effective alternative power system
- Use of alternative energy source for next generation
- Application to various environmental catalysts
- Securing advance engineering for producing photoelectrochemical solar cells

Publications (2nd stage)

Patent		Theses							Proceedings		
		domestic			foreign			total sum			
domestic	foreign	SCI	Non SCI	sum	SCI	Non SCI	sum		domestic	foreign	sum
		2	1	3	5		5	8	2	10	12

- Publications

1. E.Ramasamy, W.J. Lee, DY Lee, JS Song, Nano carbon counter electrode for dye sensitized solar cells, Applied Physics Letters,90(2007)1731031-3
2. WJ Lee, E.Ramasamy, DY Lee, JS Song, Dye sensitized solar cells: Scale up and current voltage characterization, Solar Energy Materials and Solar Cells,91(2007)1676-1680.
3. WJ Lee, E.Ramasamy, DY Lee, JS Song, Grid type dye-sensitized solar cell module with carbon counter electrode, Journal of photochemistry and photobiology A : chemistry,194 (2008) 27-30.
4. WJ Lee, E.Ramasamy, DY Lee, JS Song, Performance variation of carbon counter electrode based dye-sensitized solar cell, Solar Energy Materials and Solar Cells,92, Issue 7, July(2008) 814-818.