

EE / CprE / SE 492 - sddec24-21

CdSe Solar Cell

Week 3-4 Report

Sep 9 – Sep 19

Client: Vikram Dalal

Faculty Advisor: Vikram Dalal

Team Members:

Payton Bills – Team Lead | Client Interaction

Anders Peterson – Client Interaction | Component design

Michael Thomas – Individual Component Design | Testing

Drew Jensen – Individual Component Design | Testing

Jacob Steffens – Simulation research | Research aid discovery and distribution

Jonathan Timm – Simulation research | Simulation testing

Past Week Accomplishments

- Held meeting with faculty advisor
- Began learning how to operate the thermal evaporators to deposit CdS and CdSe.
- Began investigation of solar farm operation to determine what a “functional unit” of a solar farm may look like. Will be necessary for economic analysis.
- Began research into availability and sustainability of CdSe for scales of economy analysis
- Began research into cost of resources including Cd, Se, S, a-SiC, FTO, ITO

Pending Issues

- Need a better organized task list for the economic analysis and impact
 - Discuss more in depth with faculty advisor about a plan for making a tandem cell with CdSe and Silicon
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Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Payton Bills	Discussion with the team about possible manufacturing of CdSe, c-Si tandem cell. Shadowed graduate researchers for CdSe fabrication.	4	6
Anders Peterson	Got trained on loading thermal evaporator for CdS and CdSe and learned how to purge the system using nitrogen gas and the vacuum pumps. Discussed with the faculty advisor about creating a silicon tandem cell in addition to the CdSe cell on glass.	5	13
Michael Thomas	Began looking into the cost of materials for CdSe cells for fabrication. Team discussion about feasibility of manufacturing a tandem cell of CdSe, c-Si	2	5
Drew Jensen	Went to a meeting with Professor Dalal and started working on looking into material costs and availability.	2	3
Jacob Steffens	Write up of resource availability and sustainability of Cadmium	2	3
Jonathan Timm	Began looking into solar farm operation. Looking to break down its operation into functional units that can be used to describe and scale the operation of a farm for, theoretically, any type of solar cell.	2	4

Plans for Coming Week

- Use current solar farm data (cadmium telluride plants) to build an abstract model of solar farm functionality that is independent of solar cell material.
- Michael - Research techniques for fabricating tandem solar cells and provide a short write up for the team on the benefits and limitations, as well as potential for scalability.
- Meeting with Professor Dalal on Monday about the tandem cell idea
- Payton and Anders - explore feasibility of 4 terminal tandem cell with zinc oxide insulator.

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Gitlab Activity Summary
