

EE / CprE / SE 491 - sddec24-21

CdSe Solar Cell

Week 5 Report

Feb 28 – Mar 5

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

Completed the simulation of ideal solar cell efficiency. This includes the ideal efficiency of single-junction and two-junction solar cells. Began developing ideas for a solar farm economic analysis, and researched how CdSe may work in an actual solar farm setting.

Pending Issues

Now that our ideal efficiencies have been calculated, we can use this information to start on an economic model for the feasibility study of CdSe and CdSe + Si solar cells. While we can use the ideal values, this would make for an unrealistic model, so it may be best to continue looking into what affects the efficiencies and what could be realistically achieved in a real-world implementation of the tandem cell.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Payton Bills	Worked on a presentation to our advisor about our progress. Prepared questions for our advisor about the project. Did not get as much time to research as I would've liked, but I have significantly more time this week.	3	27
Anders Peterson	Finished the MATLAB script of the limiting efficiency of single and double junction solar cells. This is proof of why this project has a purpose.	11	31
Michael Thomas	Continued research into the viability of CdSe and started new research into how various temps (operating, ambient) affect the conversion efficiency and lifetime of a PV solar cell	3	28
Drew Jensen	Continued research into solar cell fabrication technology. Looked into CaTe fabrication techniques used by First Solar, specifically close space vapor transport. Continued reading about thermal evaporation since that is what is accessible to us on campus.	3	23
Jacob Steffens	Researched current solar installations in a hope to reverse engineer current systems with the goal of comparative analysis. Current plan is to parameterize the total MWh production, farm area, and possibly cell quantity.	6	21
Jonathan Timm	Continued researching sim software, found some results that could be useful. It is unclear as of right now. Began preliminary research on viability as well as brainstorming with Jake for a solar farm analysis project.	6	24

Plans for Coming Week

Learn about the fabrication process of CdTe, since a similar process would be used in industry for CdSe. Begin lab training so that we can fabricate the solar cells ourselves.

Gitlab Activity Summary

No activity to report.
