

Homework 5 Solar Power Africa
Due Monday September 24, 2023

This week we went through how two types of solar cells work.

- a) Explain the different thermal dependence of conductivity for a metallic conductor and a semi-conductor including the difference in mechanism between the two types of conductors. What is the Hall effect?
- b) What is a band gap and how is important to photovoltaics? Which semiconductors are optimal for solar power generation?
- c) Explain how a solar cell works (explain extrinsic and intrinsic conductivity) and plot current versus voltage for a solar cell showing the fill factor under different levels of irradiation.
- d) Tony Ranieri mentioned perovskite solar cells. Explain what a perovskite solar cell is and how it works. What are the advantages/disadvantages of perovskite cells over silicon cells?
- e) The following article discusses the tipping point for adoption of EVs in the US. <https://wapo.st/3re0zNw> Comment on the article and give your opinion on the adoption of EVs in Ohio.