

Evaluation Guidelines

The procedures for all data analysis should be shown. For evaluation, unless explicitly specified, the general guideline is that the procedure is given ~ 60% of the points and the result is given ~ 40% of the points.

Question (1) : I-V curves without light illumination

Evaluation guidelines

- a. Correct electrical circuit diagram (1 point)
- b. Correct measured I-V curve (1 point)
Please note whether there is an error analysis including reproducibility, errors due to measuring tools, and whether error bars are marked on the diagram.
- c. Correct analysis for obtaining the values of β and I_0 (1 point)

Question (2) : The characteristics of the solar cell under fixed light illumination

Evaluation guidelines

- a. Correct electrical circuit diagram (1 point)
- b. Correct I_{sc} , V_{oc} (1 point)
- c. Correctly measured I-V curve (2 points)
Please note whether there is an error analysis, data reproducibility, and whether error bars are marked on the diagram.
- d. Correct maximum output power (2 points)
- e. Correct load resistance for maximum output power (0.5 points)
- f. Correct estimate of the filling factor (0.5 points)

Question (3) : The equivalent circuit diagram of the solar cell and I-V relationship

Evaluation guidelines:

- a. Correct circuit diagram (1.5 point)
- b. Correctly derived I-V relationship (1 point)
- c. Correct I-V relationship when R_{sh} and R_s are neglected (0.5 points)

Question (4) : Variation of I_{sc} and V_{oc} under different illumination light intensities

Evaluation guidelines:

- a. Correct usage of polarizers and filters to change the illumination light intensity (1 point)
- b. Correct measurement of I_{sc} and determination of the relationship between I_{sc} and light intensity (1.5 points)
- c. Correct measurement of V_{oc} and determination of the relationship between V_{oc} and light intensity (1.5 points)

Question (5) : Short-circuit current of the solar cell under different optical filters and intensities

Evaluation guidelines:

- a. Correct measurement of the short-circuit current of the solar cell under different optical filters and intensities (1.5 points)
- b. Correctly analyzing the longest response wavelength (1 points)
- c. Correctly inferring the semiconductor material that the solar cell is made of (0.5 points)