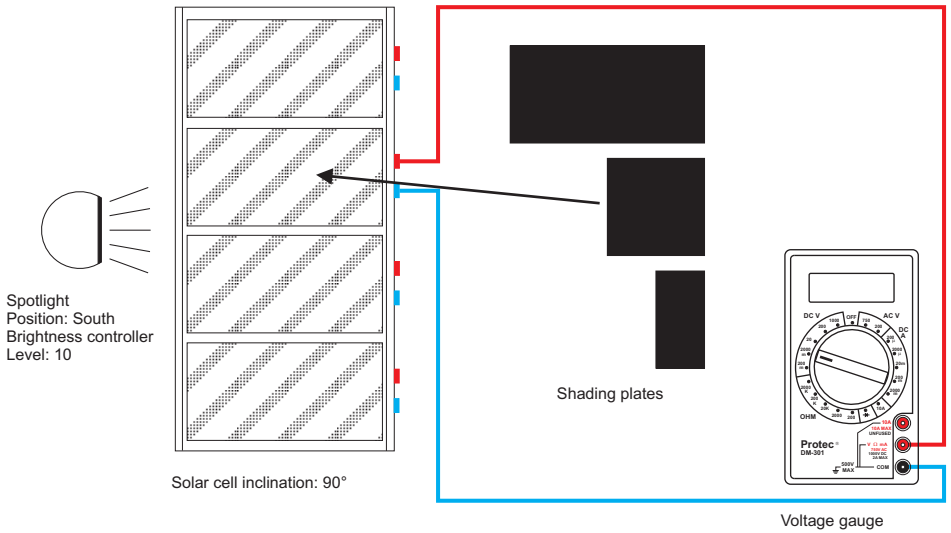
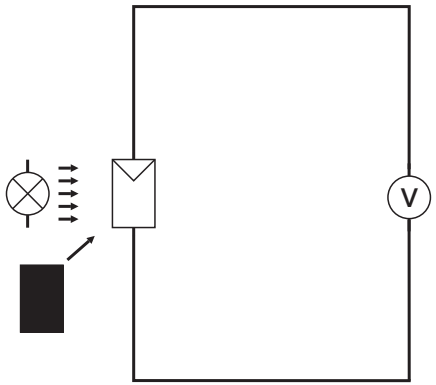
The off-load voltage of a solar cell/shading

Experiment 4

Set-up



Wiring diagram



Information

Crystalline silicon solar cells consist of two layers of semiconductors with positive and negative charge.
If light energy reaches the cell, some of the photons will be absorbed by the semiconductor.
In this way, electrons in the negative layer are released and flow from the semiconductor to the positive layer via an external circuit (see also figure for experiment 3, page 13).

At no-load condition, a voltage can be measured on the outer contacts, the off-load voltage V_L.

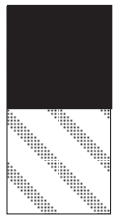
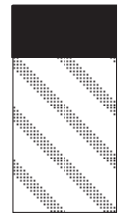
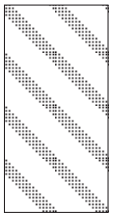
To which extent does the off-load voltage depend on the irradiated solar cell surface area?

Assignment

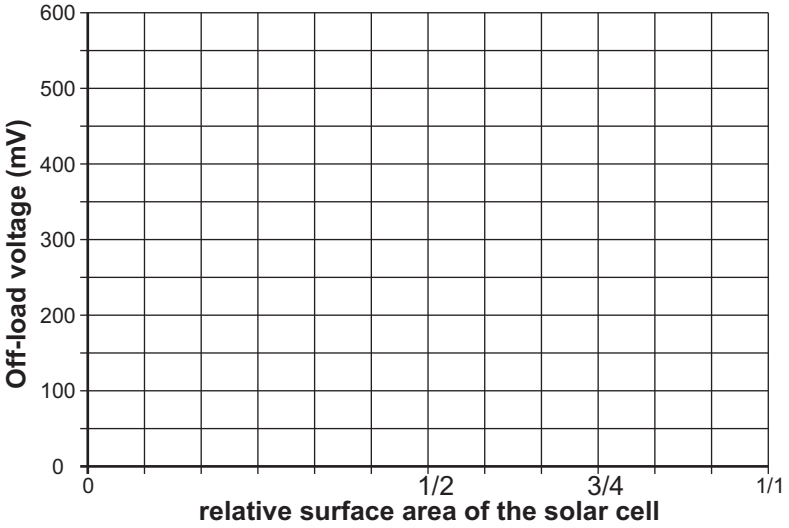
Set up the experiment according to the figure shown above.
The lamp arm is in the **South** position, the brightness controller is on level **10**.
The range selector switch of the multimeter as voltmeter must be set to position **DC V 2000 m (1 V = 1000 mV)**.

Completely cover the solar cell with the **1/1** shading plate (set controller to **0** temporarily for this shading), measure the off-load voltage, and enter the value into the table.
Continue with controller setting **10**, with ½ shading, with ¼ shading, and without shading, and measure the voltage in each case. Please enter the measured values into the table and connect the measuring points by means of lines.

A: Which finding can be obtained from the measurement?

Irradiated surface area of the solar cell	0 	½ 	¾ 	1/1 
Off-load voltage [mV]				

Off-load voltage of a solar cell/shading



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