International Journal of Advance Research in Science and Engineering
Volume No.06, Issue No. 12, December 2017
www.ijarse.com
IJARSE
ISSN: 2319-8354

Home-made Solar Cell

Mrs. Manasi V. Ghamande[1], Tanvi Pore[2], Pratiksha Mohite[3], Srushti Tavare[4] , Rutuja Goswami[5], Harshawardhan Raut[6]

[1,2,3,4,5,6]*Department of Engineering Sciences and Humanities,*
Vishwakarma Institute of Technology, (India)

ABSTRACT

This presentation will focus on preparing solar cell with simple materials from home. Solar cells are in great demand nowadays. These contribute a major share in solving the electricity crisis. This cells focuses on photovoltaic effect. Like any other solar-cell this solar also contains semiconductors.

In villages, social workers are finding it difficult to fund solar installation charges. This solar cell or this technology may be used in such areas. This will help the villagers to buil the solar cell themselves.

Keywords: Electricity, Photovoltaic, Semiconductor, Solar

I.INTRODUCTION

Solar electricity producing devices have been around for over 50 years. Solar electricity devices, often referred to as photovoltaics or PV, are still considered cutting edge technology. The promise of clean, cheap and abundant electricity from the sun has been provided by photovoltaic cells every year. On an industrial scale, these cells are prepared using silicon or using titanium compounds and iodine. This paper presented making and study of solar cell which is cheap, easy to make and generates electricity. This solar cell can be used in villages where installation of solar panels is rejected. Though this solar cell produces small amount of electricity, the similar technology can be used or villagers can be educated to prepare the same at home at much cheaper cost.

II.CONCEPT

Making solar cell with salt, water and copper plates

III.PROCEDURE

1. CLEANING OF COPPER SHEETS

We washed the copper sheets with soap to get rid of oil and grease. Moreover, sand-paper was used to remove sulphide and light corrosion.

2. HEATING OF COPPER PLATE

We placed copper plate on burner and it was being heated on high flame.

International Journal of Advance Research in Science and Engineering
Volume No.06, Issue No. 12, December 2017
www.ijarse.com
IJARSE
ISSN: 2319-8354

3. IDENTIFYING THE COPPER OXIDE WE WANT FOR SOLAR CELL

We heated copper plates for a half an hour till it was covered by thick black coating of cupric oxide. This was important, since a thick coating flaked off nicely, while a thin reddish orange coat of cuprous oxide was seen evenly coated on the copper plate.

4.COOLING OF COPPER PLATE

After the half hour of heating, we turned off the burner and left the hot copper plate on the burner to cool down slowly.

After the heated copper plate cooled the black cupric oxide shrunk. This made the black cupric oxide to flake off. This gave a nice uniform reddish orange coating of cuprous oxide beneath.

International Journal of Advance Research in Science and Engineering
Volume No.06, Issue No. 12, December 2017
www.ijarse.com
IJARSE
ISSN: 2319-8354

5. SCRUBBING THE COPPER PLATE

When the copper was cooled down to room temperature (this took about 20 minutes), most of the black oxide was gone. A light scrubbing with hands under running water removed most of the small bits. Care was taken while scrubbing to avoid scrubbing of cuprous oxide.

6.ASSEMBLING THE CELL

We attached the two clip leads, one to the pure copper plate, and one to the cuprous oxide coated plate. We mixed some salt into luke-warm tap water and stirred it until the salt in it was completely dissolved.

7.DETECTING THE CURRENT

After keeping the cell in the sun for some time, we connected the multi meter across the copper plates in the cell via connecting wires and recorded the current.

IV.FIGURES AND TABLES

V.CONCLUSIONS

Cuprous oxide with copper (I) oxidation state is reddish orange in colour.

$4Cu + O_2 \rightarrow 2Cu_2O$

Cuprous oxide is a semiconductor. It has a band gap between conductors and insulators. When the light of some frequency falls on the copper plates, some electrons jump the conduction band. These electrons are accepted by the pure copper plate since copper is unstable in its ionic form. Then it acts as a battery. Here are the half reactions

$Cu^{2+} + 2e^- \rightarrow Cu_{(s)}$ 0.34V

And

$4Cu_{(s)} + O_2 \rightarrow 2\ Cu_2O$ 0.34V

VI. ADVANTAGES

Photovoltaic cells are in great demand worldwide. India receives abundant sunlight all year long and should become a country which runs on solar power in near future. But due to lack of funding for installation of solar panels in rural areas, the solar technology has not been able to reach that flexibility. This is a small step in introducing solar technology in rural areas at absolutely no cost. Similar technology can be used to create large amount of electricity in near future to light up entire cities. Also on a household scale, when electricity is generated and used by solar cells, the loss incurred while transporting the electricity is reduced. It helps to effectively used all electricity generated.

VII. ACKNOWLEDGEMENTS:

We would like to thank honourable our director Mr.R.M. Jalanekar to give us the opportunity to perform this project. Secondly, we would also like to thank the Head of the department of humanities and science Mr.C. M. Mahajan and our batch-in-charge Mrs. Manasi Ghamande to help us and guide us throughout the preparation of project.

REFERENCES

[1] Concept: http://aip.scitation.org/doi/abs/10.1063/1.2194315

[2] https://sciencing.com › Energy

[3] Materials Concepts for solar cells, Thomas Dittrich