European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 08, Issue 01 , 2021

ROLE OF SOLAR CELL FOR CONVENTIONAL ENERGY CONVERSION IN ELECTRICAL ENERGY

Mahesh Chandra and Tanu Shree

Department of Chemistry, Deshbandu College, University of Delhi, New Delhi, India

Email: - drmahesh100@gmail.com

ABSTRACT : Electro chemistry is the process in which the electrons are "added" and "removed" from the molecule or the ion which is there in the electro chemical cell to produce "organic" and "inorganic" compound, to convert and store the energy, for the galvanic deposition of metal and alloy. Electron addition (reduction) takes place at the cathode, while electron removal (oxidation) occurs at the anode. Electro chemistry is very useful in protecting the corrosion, in sensor devices, and in other different technologies that involve the transfer of charge at an electrified interface. The electro chemical surface technologies are becoming the main issue because majority of commercial product goes through some kind of "surface treatment" so that its look, functionality, and properties can be improved.

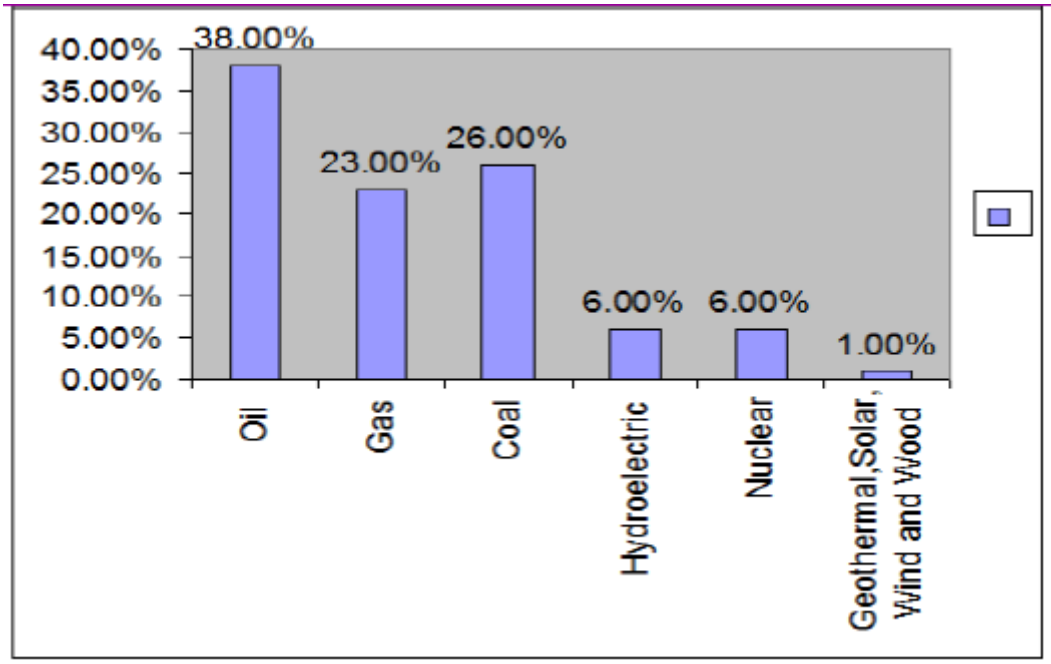
KEYWORDS: Conventional technology, Energy-transfer processes, Photo potential, Photo current.

INTRODUCTION

"Energy is defined as the "ability to do work" and this energy is directly proportional to the mass of the body which is represented as "$E=mc^2$, where E is energy, m is mass and c is the speed of light in the vacuum." During the process of eating, the energy which is stored in the food is transformed into energy and the individual to do some work and our body burns this energy while running, and walking. Reading and writing is also a king of work that are easy to do but there are times when our body do some really tough work. The energy is transformed into work in the "cars, planes, light bulbs, boats, and the machineries. The energy can never be created and destroyed but it can be converted and transformed from one to another form. This principal of energy conversion was first suggested in early 19^{th} century and was also applied to an "isolated system." Worldwide Energy Sources:

Energy Conversion: A battery is a device for instance in which the energy is transformed from one form to other (chemical energy to electrical energy) and in the same way, in a dam when the water moves with a force, the "gravitational potential energy" transformed to "kinetic energy" and finally transformed to "electrical energy" with the help of electric generators. Same process happens during chemical explosions where the "chemical potential energy" is transferred to "kinetic energy" and "thermal energy" in very short time. Since the energy is "strictly" and "locally" conserved, it is essential to note that according to the definition energy is transferred between the system and the nearby regions. In simple cases it is written as

$$\Delta E = W \qquad (1)$$



"If there is no other energy-transfer processes involved. Here ΔE=amount of energy transferred, and W is the work done on the system." Generally, the energy transfer can be split into two categories:

$$\Delta E = W + Q \quad (2)$$

Where Q represents the heat flow into the system The "open system" can receive or lose the energy in other ways also. It the "mass" is calculated as the "energy" then E must have an expression for mass "lost" or "gained." In chemical system, the energy can be added to a system by adding the substances with different chemical potentials, which potentials are then extracted. "The kinetic energy of a system of particles entering a system, or energy from a laser beam adds to system energy, without either being either work-done or heat- added, in the classic sense"

$$\Delta E = W + Q + E \quad (3)$$

There are some different types of work such as to move, lift, warm, and light something.

Conventional Energy: When the traditional technologies were used to produce the electrical power, generally it generates pollution and this is very harmful for the environment. When the fossil fuels were burn it releases very harmful and dangerous gases which is released in the atmosphere and reaches to the humans and the animals when they breathe this polluted air. This reaches to the plants as they absorb this polluted air. It is found that a huge amount of electrical power is been produces by using the traditional technologies only and since the population of the cities and the town is very huge, it is believed that the requirement of the electricity can only be fulfilled when the conventional technologies were used to produce it.

Coal: Coal is a material which is rich in carbon and generally it is found in black or brown colour and it occurs in stratified sedimentary deposit. It is a very important "fossil fuel" which is found in different parts of the world which is formed when heat and pressure is applied in the vegetation deposited in the shallow swamp of ancient time. It varies in "density, porosity, hardness, and refractivity." "Lignite, Sub bituminous, Bituminous, and

Anthracite" are the different kinds of coal that are used the fuel from the ancient time to generate the power and also to produce the coke. Different compound of the coal are used to synthesize the "dyes, solvents, and drugs." The interest to convert the coal into liquid fuels has been increased due to the search to get some alternative source of energy in different time period. In the early period of 20th century, the technology to liquefy the coal is been used. King coal is staging to come back in a somewhat spectacular way. While the world consumes roughly 4-bt (billion tons) of crude oil and about 1-bt of natural gas annually, China alone processes close to 1.2bt of coal in the U.S. as much as 60% of power is generated from coal and India will need to process about 800 Mt (million tons) of coal to boost its energy generation capacity to match demand. The reasons for coal's resurgence are not far to see. Ever increasing price, uncertainties of crude oil supply and geographical concentration in politically sensitive parts of the globe are forcing many countries to look to alternate energy sources. Coal, is among the first that come to mind. It is cheap, easily mined and, evenly distributed around the world than any other fossil fuel. Importantly, developing countries such as India and China, where demand for energy is soaring, have substantial reserves of coal.

Coal, however, comes with one serious handicap. For every unit of electricity generated from it in thermal plants, coal generates more carbon dioxide than to competing fuels-crude oil and natural gas. In a world concerned about global warming and looking to cap carbon dioxide emissions, this could put a serious dent in the use of coal to generate power. Unless, alternative can be found to make energy generation from coal a more benign processes. Coal gasification-a process that converts part of the coal into a mixture of gases-which can be burnt conventionally and in modern systems, called integrated gasification combined cycle, to produced power, or converted to chemical and fuels, is touted as just the option. Coal is considered to be the largest source of fuel that is use to produce electricity but at the same time it is the reason behind the population that harms the environment. It is found that in US 54% of the electricity is supplied by the coal.

Lalit et al has evaluated the "installed capacity" of the power station in India, the population density per km2 the concentration of radionuclide in the ash. The particulates like "oxides of sulphur, nitrogen, carbon, and toxic metals like As, Hg etc. in trace concentration" were produced when the thermal power plant uses the fossil fuels and these particulates are very risky for the health.

Oil: Oil is the complicated blend of hydrocarbons that is originated from "geologic transformation and plant and animal decomposition that have survived hundreds of millions of years ago. Technically, petroleum includes "liquid (crude oil), gaseous (Natural gas), viscous or solid (Bitumen, Asphalt) forms of hydrocarbons" which is there in the earth and are all the liquid form of oil. "Crude oil" and "natural gas" are the most important "primary fossil fuels."

From the ancient times, "Asphalt" is been used to caulk the "ships" and cover the "roads." In the middle of 1800s, the petroleum has started to replace the "whale oil" in the lamps. In the year 1859, the first well was dried to extract the petroleum and it is considered as the largest source of gasoline when the automobiles were developed. There are so many uses of petroleum and its products such as "heating, for land, air, and sea transportation, and for electric generation and as petrochemical sources and lubricants." U.S. is the biggest consumer of petroleum and along with Russia it accounts for nearly sixty percent of the of the "war energy consumption." If the rate of consumption remains the same, it is expected that till the mid of 21st century the whole supply will be used. The wells are drilled to get the

crude form of petrol and them it is transported to the refineries with the help of pipe lines, tankers, and the ships and then it is converted to "fuels," and the "petrochemicals." Primarily, the oil is used as the fuels in the automobiles, to produce the power, heat, and also used as the feed stock for the chemicals." U.S is the largest importer of the oil.

Natural Gas: Natural gas is "colourless and highly flammable" gas that includes the hydro carbons which consist of "methane," and "ethane." Heavy "hydrocarbons, carbon dioxide, hydrogen, hydrogen sulphide, nitrogen, helium, and argon" is present in natural gas and it is commonly found in combination with "crude oil." Earth id drilled to get the natural gas and some of them can be directly used but other needs the process of refining. Sometimes it is transported through the pipe lines in the natural state; otherwise, it is liquefied by cooling and then transported through the tankers. In its liquefied state, it occupies only about 1/600 of the volume of the gas.

In 1930, it is expanded as the "Ascorbic acid" and considered as a clean burning fossil fuel which is commonly used for "space" and heat the water in the buildings, and in the industrial processes. It is popularly used in the turbine to produce the electricity. Conventional energy sources are having lots of disadvantage like:

- Found only in some of the part of the world.
- Limited stock.
- Monopoly OPEC (oil producing & exporting countries) creates Lead to sudden power crises.
- Storage problem.
- Expensive.
- Very big transportation problem for shifting one place to another Place.
- Creating lot of Pollution.
- Hazardous Radiation and wastage from nuclear power plant Play harm when exposed to living system.
- Nuclear energy sources are very risky if anything goes wrong.
- The most important is the earth's atmosphere & biosphere may not survive for long time.

In order to summarize, it is concluded that all the traditional sources are associated with one or any other issue.

RESULT

Important Observations of the system:

Efforts were made to decrease the cost of energy and make the paths so that it can easily be available, remain stable at the low cost, and found natively. Therefore, suitable "reductants" and the "photo sensitizers" were selected for the present study and its analysis.

The important observations of different systems are given in Table-1, 2, that reflects the overall results of the study and also justify the importance of the cell from the "solar energy conversion and storage point of view."

Table–1
Carbol Fuchsin & EDTA

[Carbol Fuchsin] = 0.8 ×10^{-5}M pH=12.6 Temp=303K		[EDTA] =0.4 ×10^{-3}M Light Intensity=10.4mW cm^{-2}
1.	Open Circuit voltage (V_{oc})	1239.0mV
2.	Photopotential (V)	1202.0 mV
3.	Equilibrium Photocurrent (i_{eq})	160.0 µA
4.	Maximum Photocurrent (i_{max})	180.0 µA
5.	Short circuit current (i_{sc})	160.0 µA
6.	Current at power point (i_{pp})	100.0 µA
7.	Potential at power point (V_{pp})	1022.0 µA
8.	Power at power point	64.0 µA / min
9.	Rate of Generation	56.0 µA / min
10.	Conversion Efficiency	0.981 %
11.	Charging Time	180.0 min.
12.	t1/2	90.0 min.
13	Fill factor (n)	0.51

Table–2
Ponceau-S and Mannitol System

[Ponceau S] = 9.6 ×10^{-6}M pH=9.6 Temp=303K		[MANNITOL] = 4.8 x10^{-4}M Light Intensity=10.4mW cm^{-2}
1.	Open Circuit voltage (V_{oc})	1302.0mV
2.	Photopotential (V)	1282.0mV
3.	Equilibrium Photocurrent (i_{eq})	175.0 µA
4.	Maximum Photocurrent (i_{max})	210.0 µA
5.	Short circuit current (i_{sc})	175.0 µA
6.	Current at power point (i_{pp})	135.0 µA
7.	Potential at power point (V_{pp})	962.0 µA
8.	Power at power point	68.8 µA / min.
9.	Rate of Generation	62.4 µA / min.
10.	Conversion Efficiency	1.248 %
11.	Charging Time	180.0min.
12.	t1/2	75.0min.
13.	Fill factor (n)	0.56

CONCLUSION

A battery is a device for instance in which the energy is transformed from one form to other (chemical energy to electrical energy) and in the same way, in a dam when the water moves with a force, the “gravitational potential energy” transformed to “kinetic energy” and finally transformed to “electrical energy” with the help of electric generators. Same process happens during chemical explosions where the “chemical potential energy” is transferred to “kinetic energy” and “thermal energy” in very short time.

Energy is “strictly” and “locally” conserved, it is important to note that according to the definition energy is transferred between the system and the nearby regions.

The particles of kinetic energy enter into a system or it enters the system through laser beam and adds energy to the system, without either being either work-done or heat- added, in the classic sense. While the world consumes roughly 4-bt of crude oil and about 1-bt of natural gas annually, China alone processes close to 1.2bt of coal in the U.S. as much as 60% of power is generated from coal and India will need to process about 800 Mt of coal to boost its energy generation capacity to match demand.

Acknowledgement

The authors are grateful to The Principal, Deshbandhu College, University of Delhi, Kalkaji New Delhi-110019 for providing the necessary laboratory facilities to conduct this research works.

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