

Review Article

Review on Effective Utilization of Electric Energy for Water Heating by Water Changing Property

M. D. Mandhare*, S.S. Uttarwar, S. D. Kathwate and P. R. Lande

Mechanical Engineering Department, SPPU, VCOE, Ahmednagar-414008, India

Accepted 12 March 2017, Available online 16 March 2017, **Special Issue-7 (March 2017)**

Abstract

Electricity is major parameter in our life which having wide application. By survey we use maximum electric energy for comfort life. In during various application of domestic we use hot water. To heat a water use various equipment which based on electric energy. In this experiment pH of water will be changes by using natural resources by observe what will be effect on heating purpose. Energy important and major source use in industries as well as Domestic purposes. This project will give one idea about how will improve efficiency and to save energy of heating coil which are used in industry and domestic for to heat water. We know that now days we concentrated on to saving energy because one day all natural energy sources will be end. So now we concentrate on saving energy in any field and to utilize energy so it span time will increase. In America they are used shell gases which are new technique but one day it will be vanish. If we survey in world there are so many energy required to produce electricity and every person used electric energy so we need highest energy efficiency equipment. In boiler there is convention and non -convention method also some time we used coal but with considering time is money so they change input from coal to electric energy. This experiment we get best utilization of nature resource for to save energy. There will be getting best method to reduce electric energy so whenever coil or electric furnace boiler used there will be water treated process will conduct. There is hypothesis is if change in pH of water due to that electricity required to heat water is also vary.

Keywords: Heat, pH water, Natural resources

1. Introduction

This experimental study showed various methods which can save electric energy and due to that energy produced resources will increases. In boiler system water converted in to steam and we used this steam for to run turbine and produce electric energy. Now days there are some private sector also who produce electric energy by using boiler system or other application means boiler are used mostly which work of electric furnace.

In this paper we studies about water treatment after water treatment we can used this water for to make steam and observe that which method are suitable for to save energy in this experiment set up we used aqua guard concept what actually they do they reduce ph and contamination remove by using filter so by reducing ph or increasing how will save energy. During this experiment some time we use natural resources stone and other sources. This is new concept so data is not available anywhere.

This paper will give one idea about how will improve efficiency and to save energy. We know that

now days we concentrated on to saving energy because one day all natural energy sources will be end. So now we concentrate on saving energy in any field and to utilize energy so it span time will increase. In America they are used shell gases which are new technique but one day it will be vanish. If we survey in world there are so many energy required to produce electricity and every person used electric energy so we need highest energy efficiency equipment. in boiler there are convention and non convention method also some time we used coal but with considering time is money so they change input from coal to electric energy.

2. Experimental procedure And Methodology

In this experiment we use various natural resources like stone which available at river side, peat moss, driftwood. This natural resources reduce pH of water due to that pH will vary effect on thermal conductivity and amount of energy required to change temperature increase. In every day this material dipped in water and by varying time pH of water is also varies and observes that water in for various applications we target on to consume electric energy. By set up read energy meter reading then after take reading of energy meter.

*Corresponding author: M. D. Mandhare

Temperature plays a significant role on pH measurement. This is a well-know fact for most users of pH test equipment. However, the temperature affects not only your sensor but also your sample. All solutions will change their pH value with temperature. This is a result of the shifting of the chemical equilibrium of the components, mainly of dissociation. Ionization usually increases with temperature. So the amount of H+ active in solution will therefore typically increase with temperature, the pH should decrease. This trend should hold for any ionisable system.

What is Low pH? – A low pH means that there is an increase of hydrogen ions, making the water more acidic. There is less paper which related with this topic which proved that if PH Value changes then Temperature get defect. Water pH levels play an important role on the health of bodies of water and their ecosystems. This includes both plant and animal life. The range of pH levels span from extremely acidic (0.0) to extremely basic (14.0), with a neutral value of 7.0. A healthy habitat for most fish life typically requires pH levels between 6.5 and 9.0. This is partly due to the fact that the average blood pH for fish is 7.4. Because there is only a thin layer of cells separating the water in the environment from the blood vessels located in the gills of the fish, lower water pH may lower blood pH near the gills of the fish.

In this setup consist of heating coil, thermometer, carried pipe, stand and water tank. Heating coil is used to heat water by using electric energy. Thermometer is used to measure temp. Carrier pipe are for carrying water from water tank to reservoir, sand which support to water tank. Carrier pipe having very important role in this type of experiment because every time we change carrying material generally various type of stone we placed in this carrier pipe for some time after some time we heat water and taking reading after 5 minute.



Fig.1 Peat moss which reduce pH of Water

Sphagnum is a genus of approximately 380 accepted species of mosses, commonly known as peat moss. Peat moss store water capacity is good. Living and dead cells large quantity consisting it. Due to that plant height increases very well in manner. (Bold H.C. 1967) The empty cells help retain water in drier conditions. Hence, as sphagnum moss grows, it can slowly spread into drier conditions, forming larger mires, both raised bogs and blanket bogs. (Gorham, E, 1957).



Fig.2 Driftwood which reduce pH of water

Driftwood is wood that has been washed onto a shore or beach of a sea, lake, or river by the action of winds, tides or waves. It is a form of marine debris or tide wrack.



Fig. 3 Almond leaves

These natural resources we can use for reducing pH of water. These natural resources filled in water for some specific time and take reading after some specific time and take reading of energy meter.

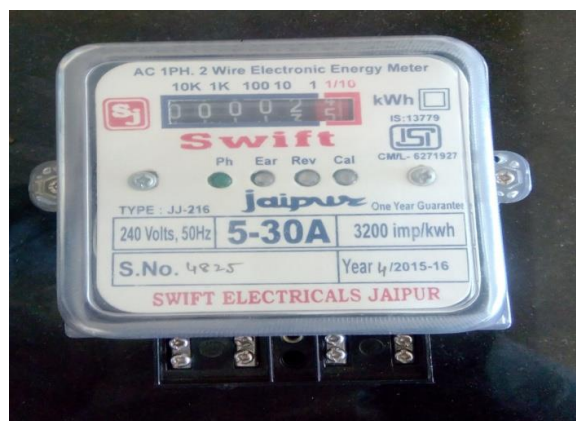


Fig. 4 Energy Meter

Energy meter are use for consumption of electric energy which is required for to heat water. by number of blinks also use for to evaluate the consumption of electricity.

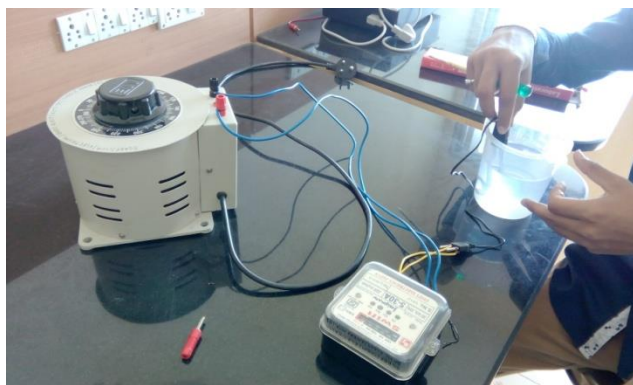


Fig. 5 Experimental Set up

By varying pH water and heat water observe temperature difference with required electric energy. In form of proportionally we add natural resources in water by observing it what effect on water pH observe.

Conclusion

Experiment there are four basic but evaluate best method

- 1) This experiment we get best utilization of nature resource for to save energy. There will be getting best method to reduce electric energy so whenever coil or electric furnace boiler used there will be water treated process will conduct.
- 2) By observation it concludes that change in pH of water it will have effect on specific heat. Comparing its result and find best method which should suitable for domestic as well as industrial area.
- 3) Objective of experiment is save electricity. Advantages of this experiment set up are very easy and no moving parts so maintenance is low.
- 4) This experiment we get best utilisation of natural resources for to save energy. There will be getting best method to reduce electric energy so wherever coil or electric furnace boiler used there will be water treated process will conduct.

References

- Saaid M.F. ,Sanuddin A., Megat Ali,M.S.A.I. M Yassin (2015) Autoimatated pH Controller System for Hydroponic Cultivation. IEEE 9th International Colloquim on, pp.186-190.
- Folly K. A and and Main T.A,(2013) Effects of Tariffs and Energy Saving Schemes on Domestic Households Energy Consumption in IEEE, Vol. 13 (2013) 68- 73
- Patil P.N. , Sawant D. V. nad Deshmukh R. N (2012) Physico – Chemical Parameters for Testing of Water – A review International Journal of Environmental Science. Volume 3,no 3, 2012, pp. 1194-1207
- Abdullahi,Mohammed Evuti1, Aloko Duncan Folorunsho1, Baba Galadima Agaie and Mohammed Jibril (December 2012) Predictive model for lime disage in water treatment plantInternational Journal of Scientific and Research Publications, Volume 2, Issue 12.
- Feroz Alam and Abid Hasniain, (2009) Studies on Swelling and Solubility of Modified from Taro : Effect of Ph and Temperature.,Agriculturae Conspects Scientifics, Vol. 74 No. 1 pp. 45-50
- Sarit Kumar Das,(Aug 2003) Department of mechanical engineering,,Heat Transfer, Indian Institute of Technology, Madras.Temperature Dependence of Thermal Conductivity Enhancement for Nano fluids. International Journal of Heat transfer, Vol. 125
- Beute N and I E Lane. (1996) A Model of Domestic hot water load Energy efficiency enterprises south Africa arnsatble road 008Lynwood manor IEEE Transaction on power system, Vol.11.
- J.H. Reed, J.C. Thompson, R.P. Broadwater and A. Chandresekaran,(February1993)Analysis of water heater data from Athens load control experiment, IEEZ Trans. Power Delivery, vol. 4, no. 2, April 1989, pp. 1232-1238.
- M.W. Gustafson, J.S. Baylor and G. Epstein, Direct water heater load control - Estimating program effectiveness using an engineering model, IEE Trans. Power Systems, vol 8, no. 1, , pp. 137-142
- CA Duff & C Bradnum (1995)design of a domestic water heating system to save water and electricity Vol.52,Issue 1, ,pp. 47-53.
- Bold, H.C.(1967). Morphology of Plants. second ed. Harper and Row, New York. p. 225-229.
- Gorham, E. (1957). The development of peatlands. Quarterly Review of Biology, 32, 145–66.