

POWER INCEPTION THROUGH SQUANDER WATER

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Abstract:

Today the water is polluted enormously by industrial sewage water and drainage and this is the right time to stop the water pollution and save the water resources. Also the consumption of power is increased because of the increase in our needs and comforts. So, it is vital to produce power as its rise in demand. The aim of our project is to control the water pollution that polluted by the industries like textile industries, chemical industries, drug manufacturing, etc. by Programmable Logic Controller and also producing the power from that drainage water.

Keywords: Sewage, PLC, Vital Produce.

1. INTRODUCTION

Here we use Automation Technology to control the water pollution and power generation. An IR sensor or biosensor is used in the path of the drainage water to sense whether the exhausted water is harmful or not. As it is harmful, initially an alarm gives the indication to the industry people, to take necessary action for the harmful water. As the harmfulness of the water continues, the power supply from the electricity board to the industry will be blocked.

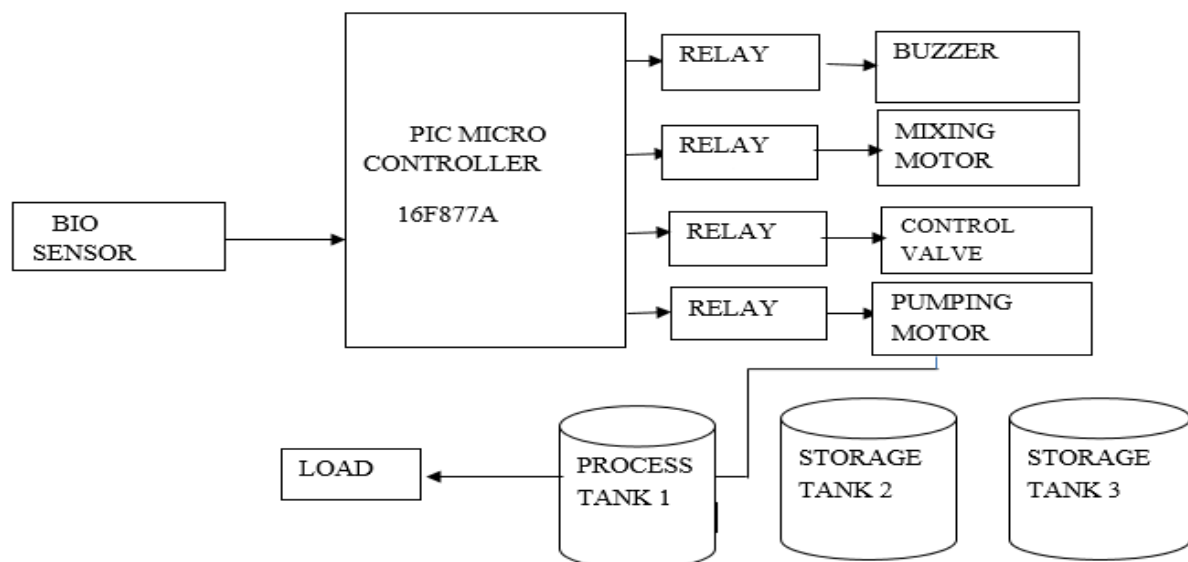


Fig.1.Block Diagram

This controller set up is a sealed kit in the industry, and the industry people have no rights to open it. Generally the water that exhausted from industry have charged ions, just by adding chemicals, it can promote the conduction of electrons. This is the formula for the power generation from sewage water.

It is important to maintain the ratio of amount of chemical that added to the amount of water. This ratio is controlled and maintained accurately by the hardwire control method. The sewage water is stored in a tank for power generation, as it fills the water is routed to the next tank some amount of chemical is added to the first tank with respect to the amount of water. As it generates the power, two electrodes (anode and cathode) are sunk into the water for obtaining generated power. This generated power is stored and used for small applications in the industry.

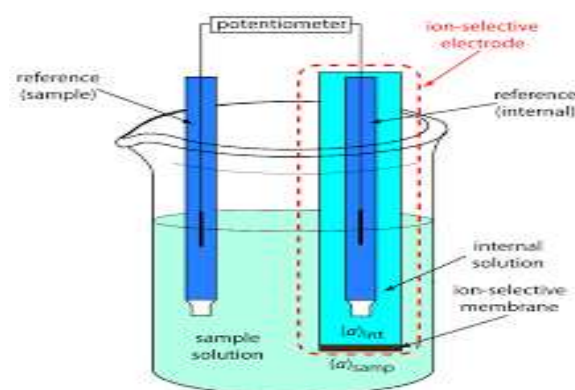
In the system “Power Inception through Squander Water” power is generated using the chemical waste water. Biosensor is fixed at the outlet pipe of the industry and is used to detect the chemical content present in the water. It is based on conductivity principle. Conductivity is the ability of the solution to conduct the electricity. Industrial chemical water, is having high conductivity, it is about 5ms/cm it is the unit of conductivity. PIC microcontroller (16F877A) is used in this system. It is programmed by using MPLAB programming. MPLAB is a free integrate development environment of embedded applications on PIC microcontrollers. MPLAB X supports editing, debugging and programming of 40 bit PIC microcontroller. At first samples of waste water is taken and checking for conductivity. If the water is having conductivity between (4 to 5mS/cm) means it is programmed as harmful water in the PIC microcontroller, else it is programmed as non- harmful water. If the water is harmful means control valve diverts the water to storage tank 1&2 for process else it is diverted to storage tank 3. In the storage tank 1&2 ferric chloride is pumped by using pumping motor. Pumping motor is operated in 230v AC supply. Mixing motor is used to stir the ferric chloride in the chemical waste water. Ferric chloride purifies the waste water and it creates mobility of electrons and thus electricity is generated. Two electrodes are fixed in the tank to extract the power from that tank and it is connected with the battery.

2. BLOCK DIAGRAM DESCRIPTION

BIOSENSOR

A biosensor is a analytic device that uses living organism or enzymes to detect the chemical content present in the water

CONDUCTOMETRIC BIOSENSOR



In this system conductometric biosensor is used. It works on the principle of conductivity. Conductivity of an electrolyte solution is a measure of its ability to conduct electricity. The SI unit of

conductivity is Siemens per meter(s/m). An alternating current is applied to the electrodes and the corresponding voltage is measured. Typical frequencies used in the range of (1-3KHZ).

PIC MICROCONTROLLER

PIC microcontroller(Programmable Interface Controller)are electronic circuits can be programmed to carry out a vast range of tasks.They can be programmed to be timers or to control a production line and much more.They are found in most electronic devices such as alarm system,computer control systems and phones.



In this system the microcontroller with the specification of PIC 16F877A is used.This is probably the most popular PIC used in many applications because of its low price, high quality and easy of availability.It is ideal for applications such as machine control applications,measurement devices,study purpose,and so on.

FEATURES OF PIC16F877A

PIC 16F877A features are 14KB of program memory,368 bytes of RAM,256 bytes of EEPROM data memory,a 40 pin package,2 CPP modules,3 timers,8 ADC channels capable of 10 bit each. Operating speed is 200ns,Wide operating voltage range (2-5.56)volts,Maximum operating frequency is 20MHZ,2 serial communication ports(MSSP,USART).

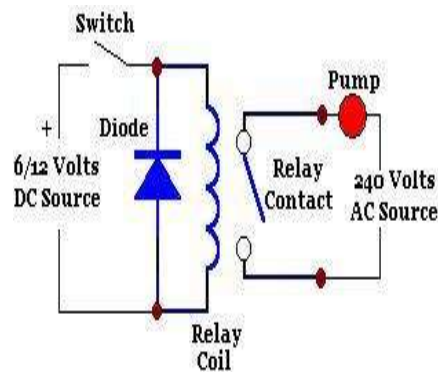
PIN DIAGRAM

PIC16F877 chip is available in different types of packages.Accordingly to the type of applications and usage these packages are differentiated.



RELAY

A relay is usually an electromechanical device that is actuated by an electrical current. The current flowing in one circuit causes opening/closing of another



PUMPING MOTOR

It is used to pump the ferric chloride into the chemical water/waste water coming out from the industry. It operates in 230 v ac power supply.



MIXING MOTOR

It is used to pump the ferric chloride into the chemical water/waste water coming out from the industry. It operates in 15 v ac power supply.



CONTROL VALVE



Control valve is used to control the flow of water to the storage tank. It diverts the harmful water to storage tank 1&2 and diverts the non- harmful water to the storage tank 3.

STORAGE TANK

Tank storage systems are designed to accommodate the specific requirements of wastewater treatment systems and are suitable for every stage of wastewater treatment including storage flocculation etc.



CONCLUSION

Electricity was generated using squander wastewater, at a power density that depended on the type of chemical water. The maximum power density using squander water is 1.5v per litre. Power generation showed a saturation-type relationship with waste water Concentration. Electricity generation was accompanied by 8676% removal of COD and 8374% removal of NH₄-N. However, phosphate concentrations Increased by 17% during treatment. These results is to generate electricity and simultaneously treat squander waters.

Acknowledgments

This research was supported by the Natural Resources Conservation Service of the United States Department of Agriculture (63-3A75-3-150), the National Science Foundation (BES 0331824), and the Paul L. Busch Award from the Water Environment Research Foundation (to BEL).

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