

Abstract

Water is a necessity for living things where 2/3 of our bodies contain liquid. The use of water that has a moderate alkaline pH value is produced and then personally consumed or traded. The author aims to make a tool for producing alkaline water or water with an alkaline pH value by utilizing one of the fields of electrical engineering.

Electrolysis is a supporting method that will be used. Electrolysis is the breakdown of an electrolyte into ions at the electrode in the presence of an electric current. The electrical conduction that passes through the electrolyte will produce a chemical change. Water molecules (H₂O) can decompose into hydrogen (H₂) and oxygen (O₂) through an electrolysis process using electric currents. The electrolysis process can produce ion separation. Then the substances contained in water are divided into two. Water containing alkaline and acidic substances.

In making this tool the authors use a three-phase voltage source as a power supply, the rectifier is used to rectify the AC voltage to DC voltage. The DC voltage that has been rectified will be lowered using the Buck regulator. The DC-DC converter itself has two types, namely the buck type DC Chopper (voltage lowering) and the Boost type DC Chopper (voltage booster). Buck type DC chopper is used in this final project because it functions as a voltage lowering. This electrolysis process will take time (30, 60, 90, and 120 minutes) and varying voltages (range 200-350 volts). To carry out the electrolysis process, an electrode is needed. Aluminum type inert electrode is an option because this type of electrode is difficult to react.

In addition, we can see the success rate of water separation through an LCD which will display the PH (potential Hydrogen) of the water. PH can be said to be acidic when it has a value <7, while a PH value > 7 has a base content. For water that is commonly consumed, it has a pH of around 6.5 -7. In addition, the design of this final project uses Arduino as a microcontroller. Arduino as a microcontroller is chosen because of its open source nature, there is already a bootloader that makes it easier to upload files from a computer.

The use of buck regulators is expected to be able to support the required voltage requirements during the electrolysis process. This tool is made with

economical components so that it can be mass-produced and used by the wider community.

Keywords: Electrolysis, Chopper, pH, Inert.