ALAT PENGUKUR TOTAL DISSOLVED SOLID (TDS) LARUTAN BERBASIS MIKROKONTROLLER ATMEGA16

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ABSTRAK

Air merupakan salah satu kebutuhan manusia khususnya air minum, tetapi ketersediaan air minum yang memenuhi syarat semakin sulit ditemui. *Total Dissolved Solid* (TDS) merupakan salah satu parameter yang termasuk dalam persyaratan kualitas air minum yaitu syarat kimia. Oleh karena itu diperlukan suatu alat ukur yang dapat mengukur kadar *Total Dissolved Solid* (TDS) dalam air, agar mempermudah masyarakat dalam mengetahui air yang layak dikonsumsi. Syarat nilai *Total Dissolved Solid* (TDS) untuk air layak konsumsi yaitu maksimal 1000 ppm (MENKES no.907/2002).

Penelitian ini bertujuan untuk membuat alat ukur *Total Dissolved Solid* (TDS) di dalam air berbasis Mikrokontroller ATMega16. Sampel yang diuji yaitu air kemasan Aqua, *Nestle*, *Le Minerale*, Ades, VIT, CLUB, air teh dan air kopi. Setiap cairan dilakukan 10 kali pengujian kemudian dibandingkan dengan TDS-3. Sensor yang digunakan yaitu elektroda *stainless steel*. Sensor akan menghitung ion di dalam air yang bergerak melewati elektroda, sehingga dapat diukur nilai TDS nya. Mikrokontroller ATMega16 akan mengontrol dan mengolah data nilai keluaran sensor TDS, kemudian akan ditampilkan pada LCD 2x16.

Setelah dilakukan pengujian beberapa sampel, air yang paling baik dikonsumsi yaitu Ades karena diperoleh nilai TDS paling rendah yaitu 44 ppm. Nilai *Error* modul TA pada larutan *Calibration solid* yaitu 0,28%, pada air kemasan Aqua 0,17%, air kemasan *Nestle* 0,42%, air kemasan *Le Minerale* 0,37%, air kemasan Ades 0,13%, air kemasan VIT 1,2%, air kemasan CLUB 0,39%, air Teh 0,2%, air Kopi 0,11%. Untuk mengetahui tingkat keakurasian alat maka batas *error* maksimal yaitu 5% (IEC no.13B-23), semakin kecil nilai *error* yang didapatkan, maka semakin akurat.

Kata Kunci: Air minum, *Total Dissolved Solid* (TDS), ATMega16.

TOTAL DISSOLVED SOLID (TDS) METER OF SOLUTION USING ATMEGA16 MICROCONTROLLER

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ABSTRACT

Water is a human need, particularly for drinking. However, the availability of qualified drinking water is rare to be found. Total Dissolved Solid (TDS) is a parameter of the water quality requirements, which is chemical condition. Therefore, it is needed to provide an instrument which can measure the level of Total Dissolved Solid (TDS) of the water in order to help people to know if the water is worth consuming. The requirement of Total Dissolved Solid (TDS) value for qualified water has maximum of 1000 ppm (MENKES no.907/2002).

This research aims to make a measuring instrument of Total Dissolved Solid (TDS) of the water using ATMega16 microcontroller. The samples were bottled water Aqua, Nestle, Le Minerale, Ades, VIT, CLUB, tea water, and coffee water. Each fluid has been tested 10 times, then it was compared to TDS-3. Sensor which was used is stainless steel electrode. The sensor would count ions in the water moving through the electrode so that the value of TDS could be measured. Microcontroller of ATMega 16 would control and process the data of the value, then it would be shown on LCD 2x16.

After testing some samples, the best water to be consumed is Ades since it has the lowest TDS value which is 44 ppm. Error value of TA module of Calibration solid is 0.28%, Aqua 0.13%, Nestle 0.42%, Le Minerale 0.37%, Ades 0.13%, VIT 1.2%, CLUB 0.39%, tea water 0.2%, and coffee water 0.11%. To know the accuracy level of the tool, the maximum number of margin of error is 5% (IEC no.13B-23). The smaller the error value which is gotten, the more accurate the result.

Keywords: Drinking water, Total Dissolved Solid (TDS), ATMega16.