

ABSTRACT

Electrolytes are compounds that are very important to support metabolic processes in the body. A tool for measuring electrolyte levels in the blood is called an Electrolyte Analyzer. The device available today are relatively expensive because they have to be imported from abroad. Therefore, the authors tried to make a simple electrolyte detection device and only measure sodium level.

The most important component of this tool is the Ion Selective Electrode to measure the voltage in the electrolyte liquid. In addition, there are supporting components, such as a multimeter. After getting the data, the data will be divided into 2, namely test data and training data, to classify electrolyte levels. The grouping uses the k-Nearest Neighbor (k-NN) classification method.

The final result of this final project is a tool used to measure electrolyte levels in liquids and is grouped with k-NN method. Data were taken from the sample fluid provided by the Mitra Anugrah Lestari Hospital Pharmacy Unit with concentrations of 110, 115, 120, 125, 130, 135, 140, 145, 150, and 154 mmol / L. The tests carried out were determining the value of electrolyte levels and testing the time of calibration which obtained an accuracy rate of 99.7% with the scheme of performing a calibration every one time the sample liquid was read. As for grouping, the highest accuracy value is 75% using the k-NN 1 feature method with Euclidean, City-Block, Chebychev, and Minkowski distance measurements with $k=1$ and also $k=3$ values. Where the value for hyponatremia is 60%, while for hypernatremia is 100% and for normal is 83.33%.

Keywords: Electrolyte, Ion Selective Electrode, k-NN