

## RINGKASAN

Indonesia merupakan salah satu negara produsen kopi terbesar di dunia, kopi juga merupakan tanaman perkebunan yang sudah lama dibudidayakan di Indonesia. Adapun jenis-jenis kopi yang dominan diolah dan diminati di Indonesia yaitu kopi arabika, kopi liberika dan kopi robusta. Kopi memiliki kadar keasaman yang dapat menentukan rasa bagi penikmat kopi. Kopi yang sudah di seduh memiliki tingkat keasaman yang berbeda-beda sesuai dengan jenis dan tingkat kematangan biji kopi yang diolah sebelum dihaluskan dan diseduh. Penelitian ini bertujuan untuk merancang bangun alat berupa sensor pH keasaman pada larutan kopi, dengan variasi suhu *roasting* serta mengukur nilai keasaman, nilai akurasi dan nilai presisi pada menggunakan rancang bangun alat pendeteksi kadar keasaman(pH) pada kopi arabika, liberika dan robusta. Metode yang di gunakan dalam penelitian ini di mulai dari analisa permasalahan, perancangan dan perakitan alat, uji karakteristik dan menganalisis data hasil pengujian. Karakteristik yang diperoleh berupa akurasi dan presisi dari alat yang telah di buat. Hasil yang diperoleh pada penelitian ini yaitu alat pendeteksi kadar keasaman(pH) berguna untuk menentukan tingkat keasaman suatu larutan kopi seperti kopi arabika, liberika dan robusta dengan variasi suhu dan waktu *roasting*. Prinsip kerja alat ini yaitu dengan mencelupkan sensor pH kedalam sampel larutan yang hasilnya akan ditampilkan pada *display* LCD TFT dengan tanda lingkaran berwarna merah jika larutan bersifat asam, berwarna hijau jika bersifat netral dan berwarna biru jika bersifat basa. Dari pengujian ini di dapatkan nilai dari kadar keasaman tiga larutan kopi, yaitu pada kopi arabika dengan suhu *roasting* 180°C memiliki kadar keasaman(pH) 4,685, suhu *roasting* 200°C memiliki kadar keasaman(pH) 5,009 dan suhu *roasting* 220° memiliki kadar keasaman(pH) 5,029. Kopi Liberika dengan suhu *roasting* 180°C memiliki kadar keasaman(pH) 4,758, suhu *roasting* 200°C memiliki kadar keasaman(pH) 4,951 dan suhu *roasting* 220° memiliki kadar keasaman(pH) 5,090. Kopi robusta dengan suhu *roasting* 180°C memiliki kadar keasaman(pH) 4,613, suhu *roasting* 200°C memiliki kadar keasaman(pH) 4,971 dan suhu *roasting* 220° memiliki kadar keasaman(pH) 5,111. Dari pengujian ini juga di peroleh karakteristik berupa nilai rata-rata akurasi sebesar 97,198% dan nilai rata-rata presisi sebesar 97,227%. Hasil dari penelitian ini di gunakan sebagai bahan untuk pengembangan alat pendeteksi kadar keasaman selanjutnya dengan melakukan berbagai variasi suhu dan waktu *roasting*.

## **SUMMARY**

Indonesia is one of the largest coffee producing countries in the world, coffee is also a plantation plant that has long been cultivated in Indonesia. The dominant types of coffee that are processed and in demand in Indonesia are Arabica coffee, Liberica coffee and Robusta coffee. Coffee has a level of acidity that can determine the taste for coffee connoisseurs. Brewed coffee has different levels of acidity according to the type and level of maturity of the coffee beans that are processed before being mashed and brewed. This study aims to design a tool in the form of a pH sensor for acidity in coffee solutions, with variations in roasting temperature and measure the acidity value, accuracy value and precision value using the design of acidity (pH) detectors in Arabica, Liberica and Robusta coffee. The method used in this research is starting from problem analysis, designing and assembling tools, testing characteristics and analyzing test data. The characteristics obtained are in the form of accuracy and precision of the tools that have been made. The results obtained in this study are acidity detectors (pH) which are useful for determining the acidity level of a coffee solution such as arabica, liberica and robusta coffee with variations in temperature and roasting time. The working principle of this tool is to dip the pH sensor into the sample solution, the results will be displayed on the TFT LCD display with a red circle if the solution is acidic, green if it is neutral and blue if it is alkaline. From this test, we get the value of the acidity of three coffee solutions, namely Arabica coffee with a roasting temperature of 1800C which has an acidity level (pH) of 4.685, a roasting temperature of 2000C has an acidity level (pH) of 5.009 and a roasting temperature of 2200 has an acidity level (pH) of 5.029. . Liberika coffee with a roasting temperature of 1800C has an acidity (pH) of 4.758, a roasting temperature of 2000C has an acidity (pH) of 4.951 and a roasting temperature of 2200 has an acidity (pH) of 5.090. Robusta coffee with a roasting temperature of 1800C has an acidity (pH) of 4.613, a roasting temperature of 2000C has an acidity (pH) of 4.971 and a roasting temperature of 2200 has an acidity (pH) of 5.111. From this test also obtained characteristics in the form of an average accuracy value of 97.198% and an average precision value of 97.227%. The results of this study are used as material for the development of further acidity detection devices by carrying out various variations of roasting temperature and time.