ABSTRAK

Korosi merupakan penurunan kualitas dari material terutama besi atau baja karena logam bersentuhan dan berhubungan dengan lingkungan sekitarnya. Banyak faktor suatu material dapat terkorosi, salah satunya yaitu adanya kehadiran elektrolit semacam garam *NaCl* pada logam yang akan memacu terjadinya reaksi korosi. Ada banyak tata cara untuk mengendalikan korosi, salah satunya adalah penggunaan inhibitor. Inhibitor yang digunakan adalah inhibitor alami yang tidak beracun, murah, dapat direproduksi dan mudah ditemukan di alam. Inhibitor alami ini dapat diperoleh dengan mengekstraksi beberapa bahan alami. Dalam penelitian bahan yang dipakai sebagai inhibitor adalah biji kopi robusta. Inhibitor organik tersebut digunakan pada material baja karbon rendah dalam media larutan *NaCl* 3,5%. Metode yang digunakan untuk mengambil data laju korosi baja karbon rendah menggunakan metode *weight loss*. Inhibitor dari ekstrak biji kopi ditambahkan ke dalam media larutan korosif *NaCl* 3,5% dengan konsentrasi 0%, 10%, 20%, 30%, dengan waktu perendaman selama enam minggu.

Penambahan inhibitor ekstrak biji kopi robusta dapat menghambat laju korosi baja karbon rendah pada larutan *NaCl* 3,5%. Hasil pengujian *weight loss* menunjukan bahwa perendaman selama enam minggu dengan penambahan inhibitor biji kopi robusta sebesar 20% memberikan nilai efisiensi inhibitor paling tinggi sebesar 67,60% dengan nilai laju korosi paling rendah sebesar 0,19 mpy. Sedangkan perendaman tanpa inhibitor mempunyai nilai laju korosi paling tinggi sebesar 1,12 mpy.

Kata kunci : baja karbon rendah, ekstrak biji kopi, inhibitor organik, korosi.

ABSTRACT

Corrosion decreases the quality of materials, especially iron or steel because the metal is in contact with and in connection with the surrounding environment. Many factors can cause corrosion of a material, one of which is the presence of electrolytes such as salts *NaCl* on metals which will accelerate the corrosion reaction. There are many methods to inhibit corrosion, one of which is the use of inhibitors. The inhibitors I use are organic inhibitors that are non-toxic, cheap, renewable, and readily available in nature. The organic inhibitors are obtained by extracting some materials that exist in nature. In this study, the material that I used as an inhibitor was robusta coffee beans. The organic inhibitor is used on low carbon steel material in solution *NaCl* 3.5%. The method used to retrieve the corrosion rate data for low carbon steel is the method *weight loss*. Inhibitors from coffee bean extract were added to the corrosive solution *NaCl* with concentrations of 0%, 10%, 20%, 30%, with an immersion time of six weeks.

addition of an inhibitor of robusta coffee bean extract can inhibit the corrosion rate of low carbon steel in a solution *NaCl* 3.5%. The results of the test *weight loss* showed that soaking for six weeks with the addition of a robusta coffee bean inhibitor by 20% gave the highest inhibitor efficiency value of 67.60% with a minimum corrosion rate of 0.19 mpy. Meanwhile, immersion without the addition of inhibitor has the highest corrosion rate value of 1.12 mpy.

Keywords: low carbon steel, organic inhibitor, coffee bean extract, corrosion.