

PENGARUH PENAMBAHAN BUBUK DAUN PEPAYA DALAM LARUTAN H_2SO_4 TERHADAP PENGHAMBATAN KOROSI PADA TEMBAGA.

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh penambahan bubuk daun pepaya sebagai inhibitor alami terhadap laju korosi tembaga dalam larutan asam sulfat (H_2SO_4). Metode yang digunakan adalah metode *weight loss* dengan variasi konsentrasi bubuk daun pepaya sebesar 0%, 2%, 4%, dan 6%. Sampel tembaga dengan luas permukaan 16 cm^2 direndam dalam larutan H_2SO_4 selama 72 jam. Hasil penelitian menunjukkan bahwa laju korosi tertinggi terjadi pada sampel tanpa inhibitor (0%) sebesar $0,43\text{ mg/cm}^2\cdot\text{jam}$, sedangkan laju korosi terendah terjadi pada konsentrasi 6% sebesar $0,26\text{ mg/cm}^2\cdot\text{jam}$. Efisiensi inhibitor meningkat seiring dengan bertambahnya konsentrasi, yaitu sebesar 18,60% pada konsentrasi 2%, 30,23% pada 4%, dan 39,53% pada 6%. Penurunan laju korosi ini disebabkan oleh adanya senyawa aktif dalam daun pepaya seperti flavonoid, tanin, alkaloid, dan saponin yang mampu membentuk lapisan pelindung pada permukaan logam melalui proses adsorpsi. Pengamatan visual juga menunjukkan bahwa tingkat kerusakan permukaan tembaga semakin berkurang dengan meningkatnya konsentrasi inhibitor. Dengan demikian, bubuk daun pepaya terbukti efektif sebagai inhibitor alami yang ramah lingkungan dalam menghambat korosi tembaga dalam larutan asam.

Kata kunci: *Korosi, Tembaga, Inhibitor Alami, Daun Pepaya, H_2SO_4 , Weight Loss*

The Effect of Adding Papaya Leaf Powder in H_2SO_4 Solution on the Inhibition of Corrosion in Copper

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ABSTRACT

This study aims to determine the effect of papaya leaf powder as a natural inhibitor on the corrosion rate of copper in sulfuric acid (H_2SO_4) solution. The method used in this research is the *weight loss method* with variations in papaya leaf powder concentrations of 0%, 2%, 4%, and 6%. Copper samples with a surface area of 16 cm^2 were immersed in H_2SO_4 solution for 72 hours. The results showed that the highest corrosion rate occurred in the sample without inhibitor (0%), which was $0.43\text{ mg/cm}^2\cdot\text{hour}$, while the lowest corrosion rate was obtained at a concentration of 6%, which was $0.26\text{ mg/cm}^2\cdot\text{hour}$. The inhibition efficiency increased with increasing concentration, reaching 18.60% at 2%, 30.23% at 4%, and 39.53% at 6%. The decrease in corrosion rate is attributed to the presence of active compounds in papaya leaves such as flavonoids, tannins, alkaloids, and saponins, which form a protective layer on the metal surface through adsorption mechanisms. Visual observations also indicated that the level of surface damage decreased with increasing inhibitor concentration. Therefore, papaya leaf powder is proven to be an effective and environmentally friendly natural inhibitor in reducing copper corrosion in acidic environments.

Keywords: *Corrosion, Copper, Natural Inhibitor, Papaya Leaf, H_2SO_4 , Weight Loss*