

**PEMANFAATAN EKSTRAK BUNGA BUGENVIL (*Bougainvillea spectabilis*  
Willd.) SEBAGAI INHIBITOR KOROSI BAJA LUNAK YANG RAMAH  
LINGKUNGAN DALAM MEDIUM ASAM KLORIDA**

**SKRIPSI SARJANA KIMIA**



Oleh:

**DINDA RAFIDAH SYAFTI**

**NIM = 2010412038**

**PROGRAM STUDI SARJANA**

**DEPARTEMEN KIMIA**

**FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM**

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## INTISARI

### PEMANFAATAN EKSTRAK BUNGA BUGENVIL (*Bougainvillea spectabilis* Willd.) SEBAGAI INHIBITOR KOROSI BAJA LUNAK YANG RAMAH LINGKUNGAN DALAM MEDIUM ASAM KLORIDA

Oleh:

Dinda Rafidah Syafti (NIM: 2010412038)  
Dr. Yeni Stiadi, MS.\*, Prof. Dr. Emriadi, MS.\*

**\*Pembimbing**

Ekstrak bunga bugenvil (*Bougainvillea spectabilis* Willd.) memiliki kandungan senyawa metabolit sekunder seperti flavonoid, fenolik dan steroid yang berpotensi sebagai inhibitor korosi baja lunak yang ramah lingkungan dalam medium asam klorida. Efektifitas inhibisi korosi ekstrak bunga bugenvil pada baja lunak dalam larutan HCl 1 M telah diteliti melalui metode kehilangan berat (*weightloss*), pengukuran polarisasi potensiodinamik, analisis *Fourier Transform Infrared Spectroscopy* (FTIR), analisis spektrofotometri *UV-vis*, karakterisasi permukaan dengan mikroskop optik dan pengukuran sudut kontak. Berdasarkan metode kehilangan berat hasil menunjukkan bahwa laju korosi baja berbanding terbalik dengan penambahan konsentrasi ekstrak bunga bugenvil dan berbanding lurus dengan peningkatan suhu. Sedangkan efisiensi inhibisi berbanding lurus dengan peningkatan suhu dan penambahan konsentrasi ekstrak bunga bugenvil. Efisiensi inhibisi maksimum pada suhu 60°C dengan konsentrasi 4 g/L yakni 92,69%. Pengukuran polarisasi potensiodinamik menunjukkan bahwa ekstrak bunga bugenvil termasuk jenis inhibitor campuran. Adsorpsi ekstrak bunga bugenvil pada permukaan baja lunak mengikuti isoterm adsorpsi Langmuir membentuk lapisan *monolayer* yang terjadi secara spontan. Analisis spektrofotometri UV-Vis dan FTIR mengindikasikan terjadinya interaksi antara ekstrak bunga bugenvil dengan permukaan baja. Karakterisasi dengan mikroskop optik memperlihatkan bahwa ekstrak bunga bugenvil dapat melindungi baja dari korosi dengan membentuk lapisan pelindung, dibuktikan dengan permukaan baja yang hanya mengalami sedikit kerusakan dengan adanya penambahan inhibitor. Pengukuran sudut kontak menunjukkan dengan penambahan ekstrak bunga bugenvil dalam medium HCl dapat meningkatkan sifat hidrofobisitas pada permukaan baja lunak.

**Kata kunci:** *Bougainvillea spectabilis* Willd., Inhibitor, Korosi, Baja lunak, Isoterm adsorpsi Langmuir



## ABSTRACT

### UTILIZATION OF BOUGAINVILLEA FLOWER EXTRACT (*Bougainvillea spectabilis* Willd.) AS AN ENVIRONMENTALLY FRIENDLY MILD STEEL CORROSION INHIBITOR IN HYDROCHLORIC ACID MEDIUM

By:

Dinda Rafidah Syafti (NIM: 2010412038)  
Dr. Yeni Stiadi, MS.\*, Prof. Dr. Emriadi, MS.\*

\*Supervisor

Bougainvillea flower extract (*Bougainvillea spectabilis* Willd.) contain secondary metabolites such as flavonoids, phenolics, and steroids which have the potential as an environmentally friendly mild steel corrosion inhibitor in hydrochloric acid medium. The effectiveness of corrosion inhibition of Bougainvillea flower extract on mild steel in 1 M HCl solution has been investigated by means of weight loss, potentiodynamic polarization measurement, Fourier Transform Infrared Spectroscopy (FTIR) analysis, UV-vis spectrophotometry analysis, surface characterization with optical microscopes, and contact angle measurement. Based on the weight loss method, the result showed that the corrosion rate was inversely proportional to the addition of Bougainvillea flower extract concentration and proportional to temperature. While the value in inhibition efficiency was proportional to temperature and addition of Bougainvillea flower extract concentration. The maximum value of the inhibitory efficiency at 60°C with a concentration of 4 g/L was 92,69%. Potentiodynamic polarization measurement showed that Bougainvillea flower extract acted as mixed type inhibitor. The adsorption Bougainvillea flower extract on the surface of mild steel follows Langmuir's isotherm adsorption, forming a monolayer layer which occurs spontaneously. Uv-Vis spectrophotometric analysis and FTIR indicated the interaction between Bougainvillea flower extract and mild steel surface. Characterization with optical microscopes showed that Bougainvillea flower extract can protect mild steel from corrosion by forming a protective layer, as evidenced by the surfaces suffer only slight damage with the addition of inhibitors. Contact angle measurements showed that the addition of Bougainvillea flower extract in the HCl medium can increase the hydrophobicity on mild steel surfaces.

**Keywords:** *Bougainvillea spectabilis* Willd., Inhibitor, Corrosion, Mild steel, Langmuir adsorption isotherm