



2019

Book of Abstracts

10th International Conference on Green Technology 2019

Empowering the 4.0 Industrial Revolution Through
Green Science and Technology



Malang, October 2nd - 3rd, 2019

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PREFACE

THE DEAN OF FACULTY OF SCIENCE AND TECHNOLOGY

UNIVERSITAS ISLAM NEGERI MAULANA MALIK IBRAHIM MALANG

It is our pleasure to very warm welcome all participant to the 2019 10th International Conference on Green Technology (ICGT 2019) in Faculty of Science and Technology, Universitas Islam Negeri Maulana Malik Ibrahim Malang. The ICGT have started ten years ago and this year, the theme of the conference is “*Empowering the Fourth Industrial Revolution through Green Science and Technology*”. Now, we are entering the fourth industrial revolution which will influence all aspect in the civilization of humankind. Thus, we hope through this conference we can contribute by the result of green science and technology in Empowering the Fourth Industrial Revolution through Green Science and Technology. And also, we hope this conference can bring academic scientists, engineers, industry researchers together to discuss, exchange and share their experiences and research results about green technology.

We would like to thank:

1. Rector and Vice-Rector of Universitas Islam Negeri Maulana Malik Ibrahim for their assistance and support for 10th International Conference on Green Technology.
2. Academic board committee for work in abstract and paper review.
3. The event organizing committee for managing this conference.
4. All the keynote speaker who willingly attended this conference.
5. Special Thanks to IOP Conference Proceeding Series, Journal of Islamic Architecture, ALCHEMY Journal of Chemistry, NUTRINO Journal, CAUCHY, and MATICS.

We wish all participants of 10th ICGT an enjoyable scientific meeting in Malang, Indonesia. We look forward to seeing all of you next year at 11th ICGT

Dean of Faculty of Science and Technology
UIN Maulana Malik Ibrahim Malang

Dr. Sri Harini

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Comparative Study of CO₂ Corrosion Inhibition of Mild Steel in Brine Solution by the Oligomers of 2-vinylpyridine and 4-vinylpyridine

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Comparative study on the use of oligomeric compounds, O(4-VP) and O(2-VP) as carbon dioxide corrosion inhibitors of mild steel was carried out. The oligomers were synthesized using hydrogen peroxide initiator. The performance of oligomers as an inhibitor was evaluated by linear polarization resistance (LPR), carried out at varying inhibitor concentrations and temperatures. This study also studied the characteristics of the adsorption and protection mechanisms of each of the corrosion inhibitors tested. The experimental results demonstrated that O(4-VP) and O(2-VP) can decrease the corrosion rate of mild steels in corrosive solution, their protection abilities are better at higher concentration. The effect of temperature on these two types of oligomeric compounds is different, in which the corrosion protection of O(4-VP) increased with temperatures, suggesting that the oligomers were chemically adsorbed by the mild steel surface while for the oligomer of O(2-VP), the opposite is true which is related to physisorption. This is supported by thermodynamic quantities of each compound, especially DGads (about -40 kJ mol⁻¹) and DHads (about 77 kJ mol⁻¹) and the value of f and Kads decreases with increasing temperature for O(4-VP, while O(2-VP) has DGads (about -20 kJ mol⁻¹) and DHads is negative. The more negative the value of DHads, the more physisorption and the more positive the value leads to chemisorption. Both 2-vinylpyridine and 4-vinylpyridine monomers give opposite results to their oligomers, in which the monomers exhibit no inhibition activity, instead they promoted the corrosion of the mild steel.

Keywords: O(4-VP), O(2-VP), mild steel, corrosion inhibitor, CO₂ corrosion



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