













- 10.20964/2018.07.50.
- [13] W. Wang, P. Dong, H. Wang, J. Cheng, and S. Liu, "Synergistic Corrosion Inhibition Effect of Molybdate and Phosphate Ions for Anodic Oxidation Film Formed on 2024 Aluminum Alloy," *J. Wuhan Univ. Technol. Mater. Sci. Ed.*, vol. 34, no. 2, 2019, doi: 10.1007/s11595-019-2069-z.
- [14] A. Pradityana, Sulistijono, A. Shahab, and L. Noerochim, "Sarang semut (Myrmecodia pendans) extract as a green corrosion inhibitor for mild steel in acid solution," *Int. J. Technol.*, 2017, doi: 10.14716/ijtech.v8i1.3400.
- [15] Y. P. Asmara, T. Kurniawan, A. G. E. Sutjipto, and J. Jafar, "Application of plants extracts as green corrosion inhibitors for steel in concrete - A review," *Indonesian Journal of Science and Technology*, vol. 3, no. 2. 2018, doi: 10.17509/ijost.v3i2.12760.
- [16] A. Ait Aghzzaf, D. Veys-Renaux, and E. Rocca, "Pomegranate peels crude extract as a corrosion inhibitor of mild steel in HCl medium: Passivation and hydrophobic effect," *Mater. Corros.*, vol. 71, no. 1, 2020, doi: 10.1002/maco.201911049.
- [17] V. Grudić, I. Bošković, S. Martinez, and B. Knežević, "Study of corrosion inhibition for mild steel in NaCl solution by propolis extract," *Maced. J. Chem. Eng.*, 2018, doi: 10.20450/mjcce.2018.1513.
- [18] N. L. Watiniash et al., "Organism Associated with Cymodocea Serumata in Different Habitats near Urban Coastal Area," 2019, doi: 10.1088/1755-1315/396/1/012006.
- [19] P. A. H. Putra, N. L. Watiniash, and N. M. Suartini, "Structure and Production of Stingless Bee Trigona spp. in Cylindrical and Round Nest Types," *J. Biol.*, 2014.
- [20] D. S. Dezmirean, C. Paşa, A. R. Moise, and O. Bobiş, "Plant sources responsible for the chemical composition and main bioactive properties of poplar-type propolis," *Plants*, vol. 10, no. 1. 2021, doi: 10.3390/plants10010022.
- [21] I. Przybyłek and T. M. Karpiński, "Antibacterial properties of propolis," *Molecules*. 2019, doi: 10.3390/molecules24112047.
- [22] H. A. R. Suleria, C. J. Barrow, and F. R. Dunshea, "Screening and characterization of phenolic compounds and their antioxidant capacity in different fruit peels," *Foods*, 2020, doi: 10.3390/foods9091206.
- [23] D. Erlienda, M. F. Rizal, and S. B. Budiardjo, "Antibacterial effect of flavonoids from propolis produced by trigona on atpase activity of streptococcus mutans," *Int. J. Appl. Pharm.*, vol. 9, no. Special Issue 2, 2017, doi: 10.22159/ijap.2017.v9s2.02.
- [24] V. C. Anadebe, O. D. Onukwuli, F. E. Abeng, N. A. Okafor, J. O. Ezeugo, and C. C. Okoye, "Electrochemical-kinetics, MD-simulation and multi-input single-output (MISO) modeling using adaptive neuro-fuzzy inference system (ANFIS) prediction for dexamethasone drug as eco-friendly corrosion inhibitor for mild steel in 2 M HCl electrolyte," *J. Taiwan Inst. Chem. Eng.*, vol. 115, 2020, doi: 10.1016/j.jtice.2020.10.004.
- [25] N. J. Mohammed and N. K. Othman, "Date palm seed extract as a green corrosion inhibitor in 0.5 M HCl medium for carbon steel: Electrochemical measurement and weight loss studies," *Int. J. Electrochem. Sci.*, vol. 15, 2020, doi: 10.20964/2020.10.45.
- [26] I. Pradipta, D. Kong, and J. B. L. Tan, "Natural organic antioxidants from green tea inhibit corrosion of steel reinforcing bars embedded in mortar," *Constr. Build. Mater.*, vol. 227, 2019, doi: 10.1016/j.conbuildmat.2019.117058.
- [27] N. Devitaningtyas, A. Syaify, D. Herawati, and S. Suryono, "Evaluation of Antibacterial Potential of Carbonated Hydroxyapatite Combined with Propolis on Porphyromonas gingivalis," *Maj. Obat Tradis.*, vol. 25, no. 1, 2020, doi: 10.22146/mot.55173.
- [28] H. M. Yang, "Role of organic and eco-friendly inhibitors on the corrosion mitigation of steel in acidic environments—a state-of-art review," *Molecules*, vol. 26, no. 11, 2021, doi: 10.3390/molecules26113473.
- [29] D. A. Skoog, F. J. Holler, and S. R. Crouch, *principles of instrumental analysis sixth edition*. 2007.
- [30] M. Ben Harb, S. Abubshait, N. Etteyeb, M. Kamoun, and A. Dhouib, "Olive leaf extract as a green corrosion inhibitor of reinforced concrete contaminated with seawater," *Arab. J. Chem.*, 2020, doi: 10.1016/j.arabjc.2020.01.016.
- [31] E. C. S. Elias and E. C. A. N. Chrisman, "Organic compounds as corrosion inhibitors for mild steel in acidic media: Correlation between inhibition efficiency and chemical structure," in *Rio Pipeline Conference and Exposition, Technical Papers*, 2009, vol. 2009-September.
- [32] S. Wang, X. Yin, H. Zhang, D. Liu, and N. Du, "Coupling effects of ph and dissolved oxygen on the corrosion behavior and mechanism of x80 steel in acidic soil simulated solution," *Materials (Basel)*., vol. 12, no. 19, 2019, doi: 10.3390/ma12193175.
- [33] S. M. Zakin Hossain, S. A. Kareem, A. F. Alshater, H. Alzubair, S. A. Razzak, and M. M. Hossain, "Effects of Cinnamaldehyde as an Eco-Friendly Corrosion Inhibitor on Mild Steel in Aerated NaCl Solutions," *Arab. J. Sci. Eng.*, vol. 45, no. 1, 2020, doi: 10.1007/s13369-019-04236-4.
- [34] M. H. O. Ahmed, A. A. Al-Amiry, Y. K. Al-Majedy, A. A. H. Kadhum, A. B. Mohamad, and T. S. Gaaz, "Synthesis and characterization of a novel organic corrosion inhibitor for mild steel in 1 M hydrochloric acid," *Results Phys.*, vol. 8, 2018, doi: 10.1016/j.rinp.2017.12.039.
- [35] H. Jafari, K. Akbarzade, and I. Danaee, "Corrosion inhibition of carbon steel immersed in a 1 M HCl solution using benzothiazole derivatives," *Arabian Journal of Chemistry*, vol. 12, no. 7. 2019, doi: 10.1016/j.arabjc.2014.11.018.
- [36] S. A. Xavier Stango and U. Vijayalakshmi, "Studies on corrosion inhibitory effect and adsorption behavior of waste materials on mild steel in acidic medium," *J. Asian Ceram. Soc.*, 2018, doi: 10.1080/21870764.2018.1439608.
- [37] A. A. Ganash, "Comparative evaluation of anticorrosive properties of Mahaleb seed extract on carbon steel in two acidic solutions," *Materials (Basel)*., 2019, doi: 10.3390/ma12183013.
- [38] A. Pradityana, Sulistijono, A. Shahab, and S. Chyntara, "Eco-friendly green inhibitor of mild steel in 3.5% NaCl solution by Sarang Semut (Myrmecodia Pendans) extract," 2014, doi: 10.1063/1.4897128.
- [39] P. Kumari, P. Shetty, and S. A. Rao, "Corrosion inhibition effect of 4-hydroxy- N' -[(e)-(1 h-indole-2-ylmethyldene)] benzohydrazide on mild steel in hydrochloric acid solution," *Int. J. Corros.*, vol. 2014, 2014, doi: 10.1155/2014/256424.
- [40] B. Lin and Y. Zuo, "Corrosion inhibition of carboxylate inhibitors with different alkylene chain lengths on carbon steel in an alkaline solution," *RSC Adv.*, vol. 9, no. 13, 2019, doi: 10.1039/C8RA10083G.
- [41] P. Geethamani, P. K. Kasthuri, S. Aejitha, and P. Geethamani, "Mitigation of mild steel corrosion in 1M sulphuric acid medium by Croton Sparciflorus A green inhibitor," *Che Sci Rev Lett*, vol. 2, no. 6, 2014.
- [42] H. J. Habeeb, H. M. Luaiibi, R. M. Dakhil, A. A. H. Kadhum, A. A. Al-Amiry, and T. S. Gaaz, "Development of new corrosion inhibitor tested on mild steel supported by electrochemical study," *Results Phys.*, 2018, doi: 10.1016/j.rinp.2018.02.015.