


Abstract

Study of the Iron Behavior in Acid Rain Water Solution by Application of Two Green Corrosion Inhibitors [†]

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- [†] Presented at the First Corrosion and Materials Degradation Web Conference, 17–19 May 2021; Available online: <https://cmdwc2021.sciforum.net/>.

Abstract: The corrosion of iron in an acidic medium similar to acid rainwater (pH = 3.6) at various rotation speeds was investigated. The investigation included the inhibiting effect of two new green formulations containing oils extracted from the seeds of *Jatropha curcas* (labeled JAC) and *Aleurite moluccana* (labeled ALM). The inhibition efficiency was evaluated using electrochemical measurements, after performing an automatic ohmic drop compensation (ZIR). The results obtained show that an increase in the rotation speed leads an increase in the current density (from 75.57 $\mu\text{A}/\text{cm}^2$ at 0 rpm to 99.09 $\mu\text{A}/\text{cm}^2$ at 1500 rpm). This increase can be explained by the increase in the amount of dissolved oxygen at the electrode surface in the acidic rain solution (pH = 3.6). Also, the two environment-friendly corrosion inhibitors both act as mixed type inhibitors that protect iron against corrosion in the acidic solution. The inhibition efficiency increases with an increase in the inhibitor concentration to attain a maximum of 97% and 96% at 250 ppm of the ALM and the JAC, respectively.

Keywords: iron; acid rain water; corrosion; greens inhibitors; *Jatropha curcas* and *Aleurites moluccana*



Citation: Zouarhi, M.; About, S.; Hammouch, H.; Chellouli, M.; Erramli, H.; Said, H.S.O.; Bettach, N.; Hajjaji, N. Study of the Iron Behavior in Acid Rain Water Solution by Application of Two Green Corrosion Inhibitors. *Mater. Proc.* **2021**, *6*, 19. <https://doi.org/10.3390/CMDWC2021-10039>

Academic Editor: Raman Singh

Published: 13 May 2021

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Supplementary Materials: The conference presentation file is available at <https://www.mdpi.com/article/10.3390/CMDWC2021-10039/s1>.

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki. The ethics approval was obtained from Ibn Tofail University in Kenitra, under the responsibility of the Laboratory of Biology and Health at the Faculty of Science, Kenitra (E511/2020). In this study, we used a minimized number of laboratory rats to limit the suffering of animals, and the experiments following the standards and principles outlined in the «Guide for the care and use of laboratory animals».

Informed Consent Statement: Not applicable.

Data Availability Statement: <https://sciforum.net/paper/view/10039>.