CHARACTERIZATION OF CORROSION RATE BEHAVIOR BODY AUTOMOBILES PLATE OF 0.5 M H₂SO₄ SOLUTIONS WITH CYCLIC WET-DRY METHOD SAE J2334

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Abstract

Auto body often in direct contact with the atmosphere and weather changes, which can lead to the formation and drying a thin layer of electrolyte. This weather cycle could result in a cyclic corrosion on the plate auto body. This corrosion can occur due to acid rain attacks or areas with high sulfur content. Due to acid rain attacks or areas with high sulfur content.

This study uses specimens from the body plate of Mercedes W 124 (Europe / M Specimen), Innova (Indonesia / T Specimen), and CR-V (Japan / C Specimen) as a comparison. And the solution used in this study is 0.5 M H₂SO₄. The specimen were subjected to conditions wet - dry cyclic intervals of 20 cycles, 30 cycles, 40 cycles, 50 cycles, and 60 cycles as the simulation of climate change. Specimens which experienced the largest rate of corrosion is specimen T = 10.07301613 MPY, then specimen C = 6.292531955 MPY and M specimens is the smallest of 2.092593866 MPY. Corrosion rate of wet – dry cyclic corrosion rate increase experienced a trend towards increased cycle. And immersion test performed at intervals of 80 hours, 120 hours, 160 hours, 200 hours and 240 hours as a comparison the rate of corrosion. The rate of corrosion of the largest immersion test at 80 hours or at the beginning of the test, that is for T specimen = 4.155330194MPY, C specimen = 2.989416145 MPY and M specimens of 2.804416054 MPY. Trends in the rate of
corrosion in immersion test was decreased with increasing immersion time.

Characterization is done by visually identifying the use of XRF, SEM and XRD. From the test will be obtained characterization data that the form of corrosion that occurs are uniform corrosion, intergranular corrosion, and pitting corrosion indications. Corrosion products formed include brown rust $\gamma$-$\text{Fe}_2\text{O}_3$ (Ferrite Oxide), Fe$_2$(SO$_4$)$_3$ (Iron Sulfate), Zink Oxide (ZnO) and Fe$_3$O$_4$ (black rust).

**Keywords:** wet-dry corrosion, auto body plate, cyclic method, immersion method.