

Analysis of the Effect of Zea Mays Husk Particulate Reinforcement on 1170 Aluminium Corrosion in a Simulated Industrial Environment

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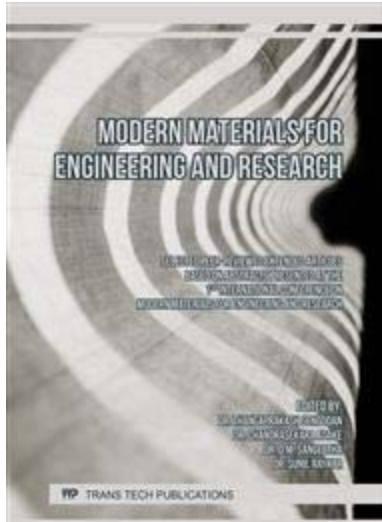
Abstract:

The worldwide need for lightweight, high-quality, high-performance, and low-cost materials is prompting a change in emphasis from unreinforced materials to reinforced/composite materials. The mechanical properties of the MHP reinforced aluminum composite are compared to those of the unreinforced metal using the data on the corrosion performance of maize husk particulate reinforcement on high 1170 Aluminium alloy in 0.00625 M H₂SO₄, 3.5 wt.% NaCl and a mixture of both solutions was studied using weight loss technique to determine the corrosion rates of the specimens. Optical microscopic analysis was also carried out on the specimens to determine the effect of the reinforcement on the microstructural properties of the material before and after corrosion. The corrosion rates calculated from the weight loss study revealed differences in the corrosion characteristics of the specimens in the various solutions when compared to the control specimen. The presence of reinforcement in the matrix was discovered to positively impact the corrosion behavior of composite materials via the production of corrosion resistant oxides. The electrochemical properties of maize husk enhances the corrosion resistance of the composite due to its ability to form a protective oxide film and chemically resistant inclusions on the surface of the material.

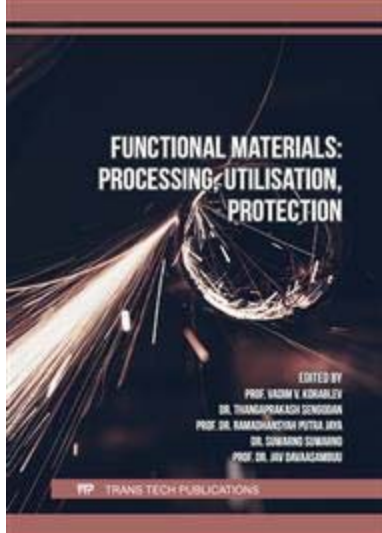
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