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About this Abstract

Meeting	2015 TMS Annual Meeting & Exhibition
Symposium	Engineering Solutions for Sustainability: Materials & Resources (ESS: M&R)
Presentation Title	Investigating <i>Solanum Aethiopicum</i> Leaf-Extract and Sodium-Dichromate Effects on Steel-Rebar Corrosion in Saline/Marine Simulating-Environment: Implications on Sustainable Alternative for Environmentally-Hazardous Inhibitor
Author(s)	Joshua Olusegun Okeniyi, Adebajji Samuel OGBIYE, Olubanke Olujoke OGUNLANA, Elizabeth Toyin OKENIYI, Oluseyi Ebenezer OGUNLANA
On-Site Speaker (Planned)	Joshua Olusegun Okeniyi
Abstract Scope	This paper investigates <i>Solanum aethiopicum</i> leaf-extract and the well-known but environmentally-hazardous sodium-dichromate inhibitor effects on concrete steel-rebar corrosion in 3.5% NaCl medium (simulating saline/marine environment). Different equal-concentration models (wt% cement) of the natural-plant leaf-extract and of sodium-dichromate were admixed in steel-reinforced concrete slabs from which electrochemical test-measurements were obtained for comparing admixture performance. Test-results, analysed as per ASTM G16-95 R04, showed that only the 0.083% sodium-dichromate admixture outperformed the 0.083% <i>Solanum aethiopicum</i> leaf-extract in corrosion inhibition effectiveness. The other natural-plant leaf-extract exhibited better inhibition-efficiency performance than their equal-concentration models of sodium-dichromate. The 0.25% <i>Solanum aethiopicum</i> leaf-extract exhibited optimal performance, $\eta = 98.28\%$, at inhibiting steel-rebar corrosion among the also effective different concentrations of the plant-extract and of sodium-dichromate admixtures employed. These and phytochemical test-results bare indications that <i>Solanum aethiopicum</i> leaf-extract is a suitable, sustainable and eco-friendly alternative for the environmentally-hazardous sodium-dichromate inhibitor of steel-rebar corrosion in concrete designed for saline/marine environments.
Proceedings Inclusion?	Planned: A print-only volume

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