Title: Inhibition Effect Of Vernonia Amygdalina Extract On The Corrosion Of Mild Steel Reinforcement In concrete in 0.2 M H2SO4 Environment.

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Abstract: Inhibition effect of Vernonia amygdalina (bitter leaf) extract on the corrosion behaviour of embedded mild steel rebar in concrete immersed in 0.2% H2SO4 solution was investigated by potential measurement, pH and gravimetric methods using the extracts concentrations of 25, 50, 75, and 100%. The results were further analysed using the two-factor ANOVA test. Potential measurement was performed using a digital voltmeter and a copper/copper sulphate reference electrode. Compressive strength of each block sample was determined after the experiments. Weight loss values were obtained from the gravimetric method, and the inhibitor efficiency was computed from the corrosion rate of each of the tested samples. Results showed that varied concentration of V. amygdalina and the test exposure time significantly affect both the corrosion potential of embedded steel rebar in concrete and the pH of the medium. The extracts gave appreciable corrosion inhibition performance of the embedded steel rebar at 25 and 50% concentrations with the weight loss of 500 (0.5 g) and 400 mg (0.4 g) and corrosion rates values of 0.000240 and 0.000180 mm/yr, respectively. The highest inhibition efficiency (60.68%) was achieved at 50 and 39.94% at 25% concentrations, respectively. The 100 and 75% concentrations gave negative inhibitor values of -51.52 and -20.11%. The ANOVA test confirmed the results at 95% confidence, and further showed that concentration of V. amygdalina had greater effect on potential and pH measurements.