

Accepted Manuscript

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PII: S0167-7322(18)30445-8
DOI: doi:[10.1016/j.molliq.2018.05.058](https://doi.org/10.1016/j.molliq.2018.05.058)
Reference: MOLLIQ 9113
To appear in: *Journal of Molecular Liquids*
Received date: 27 January 2018
Revised date: 10 May 2018
Accepted date: 13 May 2018

Please cite this article as: K. Haruna, I.B. Obot, N.K. Ankah, A.A. Sorour, T.A. Saleh , Gelatin: A green corrosion inhibitor for carbon steel in oil well acidizing environment. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:[10.1016/j.molliq.2018.05.058](https://doi.org/10.1016/j.molliq.2018.05.058)

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Gelatin: A Green Corrosion Inhibitor for Carbon Steel in Oil Well Acidizing EnvironmentK. Haruna^{a,b}, I.B. Obot^{b,*}, N.K. Ankah^c, A.A. Sorour^{b,c}, T.A. Saleh^a

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Abstract

Corrosion inhibition performance of an environmentally benign compound, gelatin on X60 steel in 15% hydrochloric acid (HCl) at 25°C, which simulate oil well acidizing environment was investigated in this study. The inhibition efficiency of the gelatin was examined using weight loss, potentiodynamic polarization (PDP), linear polarization (LPR), and electrochemical impedance spectroscopy (EIS) measurements techniques. Both the weight loss and the electrochemical results showed that the gelatin exhibits high inhibition efficiency and the inhibition efficiency increases with increasing gelatin concentration. The addition of low concentration of potassium iodide improves the inhibition efficiency of gelatin considerably. The ATR and SEM/EDX surface morphology analyses of the provide evidence of formation of protective gelatin film on the metal surface. The gelatin molecules are predicted to adsorb on the metal surface through an interaction between the nitrogen and oxygen atoms of gelatin and the metal surface to form a metal/gelatin complex on the metal surface.

Keywords: Gelatin; Carbon Steel; Corrosion Inhibitors; Acidizing; Electrochemical Techniques.

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