



## **4-((2,4-Dihydroxyphenyl)Diazenyl)-3-Hydroxy-5-(Phenylamino) Thiophene-2-Carbonitrile as Corrosion Inhibitor for Carbon Steel in Sulfuric Acid Solution and its Biological Activity**

**A.S.Fouda<sup>1\*</sup>, S. A. Abd El-Maksoud<sup>2</sup>, S.A. Gomaa<sup>3</sup> and A.Elsalakawy<sup>3</sup>**

1. Department of Chemistry, Faculty of science, El-Mansoura University, **EGYPT**

2. Department of Chemistry, Faculty of science, Port Said University, **EGYPT**

3. El-Delta Company for Fertilizers and chemicals, Talkha, El-Daqahlia, **EGYPT**

Email: [asfouda@hotmail.com](mailto:asfouda@hotmail.com)

Accepted on 13<sup>th</sup> August 2017, Published online on 27<sup>th</sup> September 2017

---

### **ABSTRACT**

*4-((2,4-dihydroxyphenyl)diazenyl)-3-hydroxy-5-(phenylamino) thiophene-2-carbonitrile is a new compound used as a corrosion inhibitor for carbon steel (CS) used in cooling towers in industrial processes and studying of inhibition efficiency (%I<sub>E</sub>) by classical method as weight loss (WL) and electrochemical technique (potentiodynamic polarization technique (PP), electrochemical impedance spectroscopy (EIS), electrochemical frequency modulation (EFM) The results showed the variation in inhibition performance of the inhibitor with varying doses and temperatures. The maximum %I<sub>E</sub> was found to be 84 % at  $2.4 \times 10^{-4}$  M dose of the inhibitor for the immersion period of 3 h at 25<sup>o</sup>C. PP study clearly revealed that this compound acts as mixed type inhibitor. The results of various electrochemical techniques show good agreements with each other. Although thiophene-2-carbonitrile derivative has biological activity on the bacteria extracted from ammonia cooling tower in Delta Company for fertilizers and chemical industries.*

**Keywords:** Carbon steel, EIS, PP, EFM, Biological activity.

---