

ARC '18

مؤتمر مؤسسة قطر
السنوي للبحوث

QATAR FOUNDATION
ANNUAL RESEARCH CONFERENCE

البحث والتطوير: التركيز على
الأولويات، وإحداث الأثر

R&D: FOCUSING ON PRIORITIES,
DELIVERING IMPACT

20-19 مارس
19-20 MARCH



مؤسسة قطر
Qatar Foundation

إطلاق قدرات الإنسان.
Unlocking human potential.

Energy and Environment - Poster Display

<http://doi.org/10.5339/qfarc.2018.EEPD356>

Corrosion behavior of high strength low alloy HSLA steel in 35 wt% NaCl solution containing diethylenetriamine DETA as corrosion inhibitor

Abdul Shakoor*, Khuram Shahzad, Mostafa H. R Sliem, Fareeha Ubaid, Himyan M Akbar, Aboubakr M Abdullah, Ramazan Kahraman, Fatima M Montemor, Umair Manzoor

Center for Advanced Materials (CAM), Qatar University, Doha, Qatar
* shakoor@qu.edu.qa


High strength low alloy (HSLA) steels demonstrate improved mechanical and anticorrosion properties when compared to plain carbon steels. HSLA steels have succeeded to find their major applications in industries such as defense (gun barrel, turret), food, component manufacturing, wind tunnels, power generation, and water jet cutting, etc. There are significant economic benefits to develop novel materials to mitigate the harmful effects of corrosion. At the same time, the corrosion challenges have also been addressed using various kinds of inhibitors. The corrosion inhibitors are commonly added to the corrosive medium in order to reduce their aggressive attack on the materials to improve their inhibition performance. The smart corrosion protection leads to secure our natural resources, time, efforts, energy and will also ensure a safe operation. The aim of this research work is to study the corrosion behavior of high strength low alloy steel (APIX120) in 3.5 wt.% NaCl solution containing different concentrations of diethylenetriamine (DETA). The electrochemical behavior of HSLA steel was investigated at room temperature using potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) and weight loss techniques. In addition, the adsorption isotherm, activation energy and other thermodynamic parameters were calculated from the electrochemical results. The corrosion products formed on the surface of the steel were characterized using X-ray diffraction (XRD) and scanning electron microscopy (SEM). Furthermore, surface topography and surface roughness of un-corroded and rusted samples

© 2018 The Author(s), licensee HBKU Press. This is an open access article distributed under the terms of the Creative Commons Attribution license CC BY 4.0, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

دار جامعة حمد بن خليفة للنشر
HAMAD BIN KHALIFA UNIVERSITY PRESS



Cite this article as: Shakoor A et al. (2018). Corrosion behavior of high strength low alloy HSLA steel in 35 wt% NaCl solution containing diethylenetriamine DETA as corrosion inhibitor. Qatar Foundation Annual Research Conference Proceedings 2018: EEPD356
<http://doi.org/10.5339/qfarc.2018.EEPD356>.



were studied by atomic force microscopy (AFM) to elucidate the effect of the aggressive media on the corrosion performance of HSLA steel. Our study discloses that the inhibition efficiency of HSLA steel increases with increasing concentration of DETA in 3.5% NaCl solution.