Effect of Rotating Speed and Hydrostatic Pressure on Erosion-
Corrosion Behavior of X65 Pipeline Steel

Qiongbin Zheng, Liuyan Zhang*, Xiaohua Jie*, Xiaoye Huang, Song Luo

School of Materials and Energy, Guangdong University of Technology, Guangzhou 510006, PR China
*E-mail: zlyjust@gdut.edu.cn (Liuyan Zhang); cnxyyz3@gdut.edu.cn (Xiaohua Jie)

doi: 10.20964/2017.03.10

Received: 30 November 2016 / Accepted: 8 January 2017 / Published: 12 February 2017

A simple rotating experimental setup with adjustable rotating speed and hydrostatic pressure was
established to simulate the erosion-corrosion environment. The effect of rotating speed and hydrostatic
pressure on the erosion-corrosion behavior of X65 steel in 3.5 mass% NaCl was investigated by
polarization, electrochemical impedance spectroscopy, and scanning electron microscopy. The results
revealed that the rotating speed changed the corrosion type of X65 steel from a pure uniform
electrochemical corrosion into the combination of uniform corrosion and local damage, which was
aggravated with increasing the rotating speed. The hydrostatic pressure has the opposite effect on the
uniform and local corrosion of X65 steel, showing a decrease of uniform corrosion and an increase of
local damage.

Keywords: X65 steel; rotating speed; hydrostatic pressure; erosion-corrosion; local damage

FULL TEXT

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