

# Accepted Manuscript

Multifactorial study of erosion–corrosion wear of a X65 steel by slurry of simulated copper tailing

Javiera Aguirre, Magdalena Walczak

PII: S0301-679X(18)30222-6

DOI: [10.1016/j.triboint.2018.04.029](https://doi.org/10.1016/j.triboint.2018.04.029)

Reference: JTRI 5208

To appear in: *Tribology International*

Received Date: 7 February 2018

Revised Date: 16 April 2018

Accepted Date: 25 April 2018

Please cite this article as: Aguirre J, Walczak M, Multifactorial study of erosion–corrosion wear of a X65 steel by slurry of simulated copper tailing, *Tribology International* (2018), doi: 10.1016/j.triboint.2018.04.029.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## **Multifactorial study of erosion–corrosion wear of a X65 steel by slurry of simulated copper tailing**

Javiera Aguirre, Magdalena Walczak\*

Department of Mechanical and Metallurgical Engineering, Escuela de Ingeniería, Pontificia Universidad Católica de Chile, Vicuña Mackenna 4860, Santiago, Chile.

\*Corresponding author. Email address: mwalczak@ing.puc.cl (M. Walczak)

### **ABSTRACT**

A multifactorial study of erosion–corrosion (E–C) is carried out to quantify the effects of velocity, particle concentration, temperature, pH, dissolved oxygen, and copper ion content, with respect to the transport of tailings slurry through an API 5L X65 pipe. The experimental design is implemented using a rotating cylinder electrode and evaluating the resulting E–C damage by weight loss. An analysis of the statistical significance reveals that the variation in the wear rate is explained by three main effects (velocity, oxygen, and temperature) and two interactions (velocity/oxygen and particle/copper content). An empirical equation is formulated to produce contour maps of the main interactions. It is concluded that the primary damage mechanisms are the deposition of corrosion products consecutively disturbed by impinging particles and localized plastic deformation.

**Keywords:** Erosion–corrosion, Multifactorial, API 5L X65 steel, Rotating cylinder electrode.

Download English Version:

<https://daneshyari.com/en/article/7001501>

Download Persian Version:

<https://daneshyari.com/article/7001501>

[Daneshyari.com](https://daneshyari.com)