

## Accepted Manuscript

Title: Influence of phytic acid on the corrosion behavior of iron under acidic and neutral conditions

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PII: S0013-4686(14)02035-0  
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2014.09.160>  
Reference: EA 23543

To appear in: *Electrochimica Acta*

Received date: 4-6-2014  
Revised date: 17-9-2014  
Accepted date: 29-9-2014

Please cite this article as: Xiang Gao, Caicai Zhao, Haifeng Lu, Feng Gao, Houyi Ma, Influence of phytic acid on the corrosion behavior of iron under acidic and neutral conditions, *Electrochimica Acta* <http://dx.doi.org/10.1016/j.electacta.2014.09.160>

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Influence of phytic acid on the corrosion behavior of iron under acidic and neutral conditions

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Abstract

The influence of phytic acid (PA) on the corrosion of iron under acidic and neutral conditions was investigated by means of Electrochemical Impedance Spectroscopy (EIS) and polarization curve methods. The electrochemical results indicate that, PA can effectively inhibit the corrosion of iron as a mixed type inhibitor in H<sub>2</sub>SO<sub>4</sub> solution; however, PA tends to react with the dissolved Fe (II) ions, forming stable metal chelate complexes with strong anodic inhibition action on the iron surface, in Na<sub>2</sub>SO<sub>4</sub> solution. Fourier Transform Infrared Spectroscopic (FTIR) analysis confirms the existence of PA or its salts on the iron substrates. X-ray Photoelectron Spectroscopic (XPS) characterization demonstrates that PA adsorbs on

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