

Corrosion of pipeline grade steel in aqueous conditions

Iasonas Zekos, Prof Margaret Stack

Department of Mechanical and Aerospace Engineering, University of Strathclyde, Glasgow

Summary:

The purpose of this research is to identify and map factors and mechanisms affecting Corrosion of pipeline steels used in the upstream oil industry. Results are obtained from tests conducted in aerated and deaerated environment.

Abstract:

Erosion-corrosion by solid particles is a problem of great significance in the upstream petroleum industry. Accelerated and unpredicted material degradation causes financial and environmental issues, raising the need for an effective erosion-corrosion prediction mechanism. The complex interactions of a number of different parameters affecting both erosion and corrosion impede the accurate prediction of material loss mechanisms and material loss rate in these environments. This study focuses on the electrochemical aspect of material degradation of pipeline grade steels. Samples of UNS G41300, UNS S41000 and UNS S41426 steels are subjected to aqueous corrosion. Data gathered from mass measurement, surface analysis and potentiodynamic measurements are used to understand the corrosion mechanisms in action. The effects of temperature and oxygen concentration are investigated.