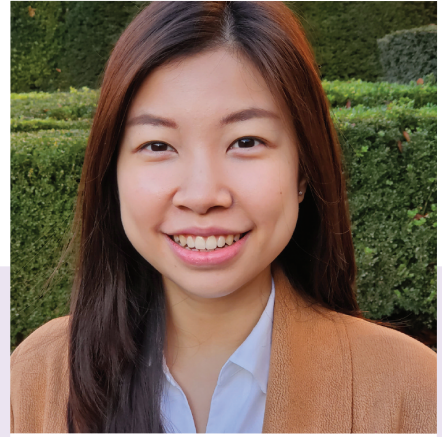




**Imperial College
London**

Speaker 10

Design of in situ cathodic charging of TMCP steel under flexural loading



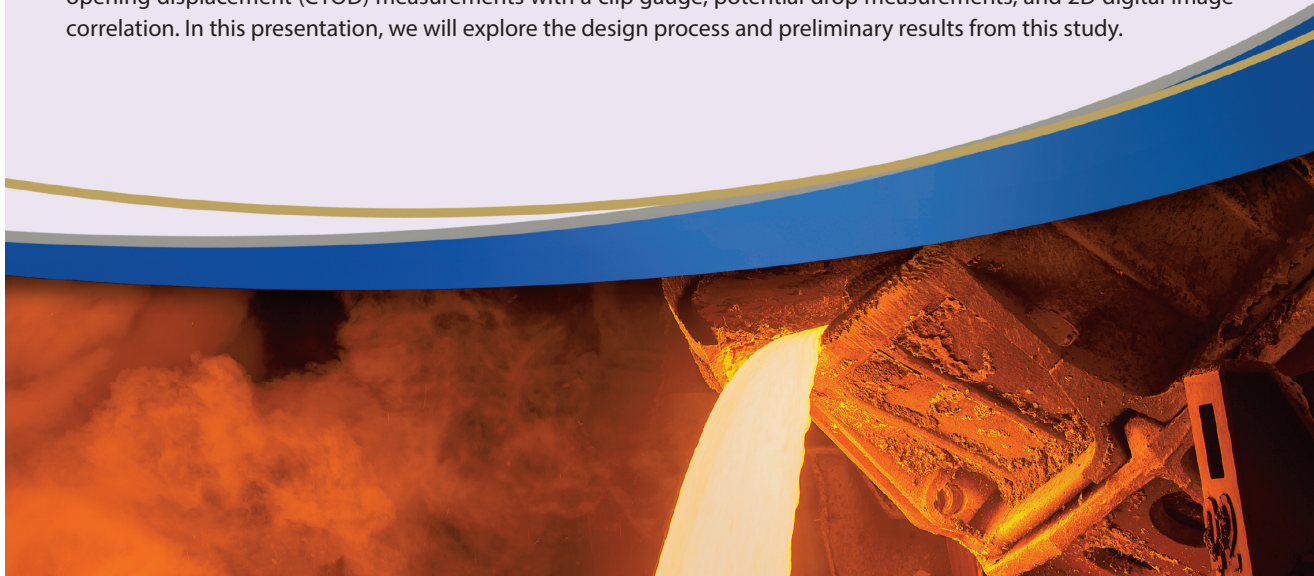
Sarah Hiew Sze Kei

SPEAKER / LEAD AUTHOR:
Sarah Hiew Sze Kei

INSTITUTION:
Imperial College London

OTHER AUTHORS:
Bostjan Bezensek, Shell Global Solutions UK
Steve Paterson, Shell Global Solutions UK
Willem Maarten van Haaften, Shell Global Solutions International BV
Dr Thibaut Dessolier, Imperial College London
Dr Stella Pedrazzini, Imperial College London
Dr Ben Britton, The University of British Columbia

ABSTRACT:
Thermo-Mechanical Control Process (TMCP) steels are used in oil and gas production because of good cost-performance ratio. However, they may be at risk of premature failures in low pH environments. These environments may promote hydrogen formation and ingress into, leading to embrittlement of, the steel, potentially resulting in failure via associated with Sulphide Stress Cracking (SSC). In this work, we are developing in situ methods to charge with hydrogen while loading TMCP samples mechanically to understand these mechanisms. We have designed a three-point bend rig to enable flexural loading of single-edged notched bend sample within an electrochemical cell. The rig design work has included in situ electrochemical charging and crack monitoring. Crack monitoring is being performed using crack tip opening displacement (CTOD) measurements with a clip gauge, potential drop measurements, and 2D digital image correlation. In this presentation, we will explore the design process and preliminary results from this study.



Organised by:



**Materials
Processing
Institute**



I.M3

