



Speaker 6

Hydrogen diffusion in pipeline steel API 5L X65



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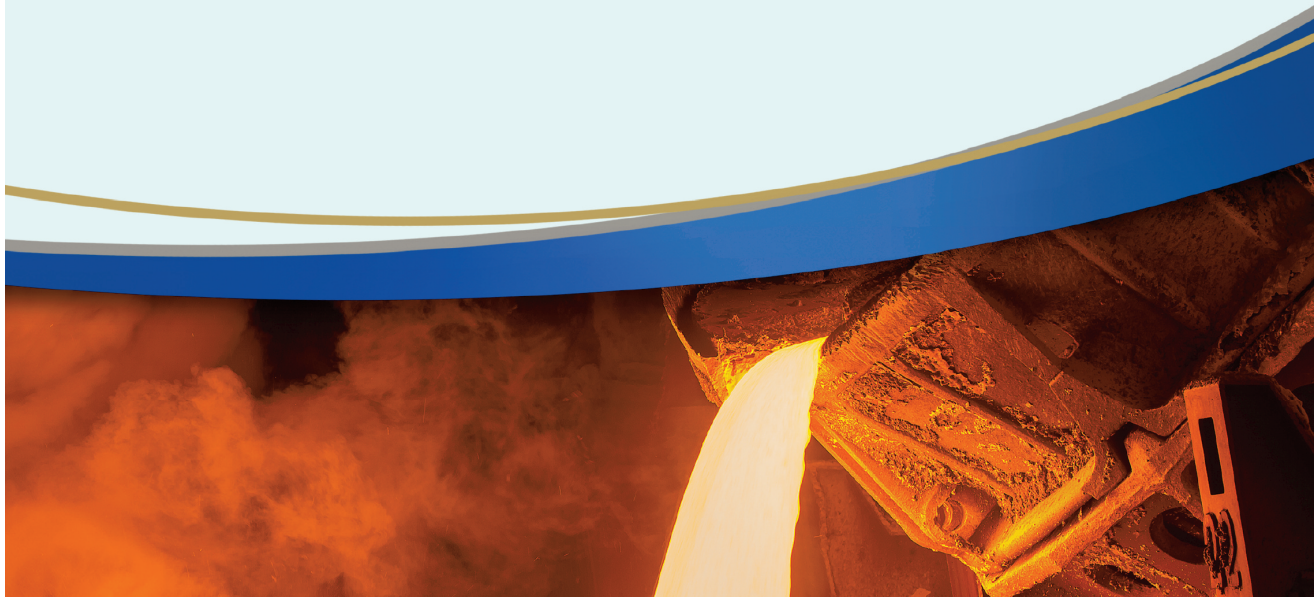
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ABSTRACT:

Climate change is driving a transition in the energy sector, with low-carbon energy vectors such as hydrogen (H₂) emerging as an alternative to fossil fuels. However, hydrogen is known to cause premature failure of components. Therefore, it is imperative to evaluate to what extent will hydrogen induced failure limit the service conditions of steel pipelines, which are essential components for the future H₂ transportation infrastructure.

This poster will review important fundamentals of hydrogen entry and diffusion in steels, in particular similarities and differences expected to occur between gaseous and electrolytic hydrogen charging and the influence of microstructural features in the hydrogen mobility throughout the material. This work focuses on a specific steel grade commonly used in pipelines - API 5L X65 – and it aims to investigate the hydrogen diffusivity of this steel grade under different electrolytic charging conditions, using hydrogen permeation testing (ISO 17081:2014).



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