

Research on the development of pipeline steel hydrogen permeation

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Abstract Pipelining is currently one of the most environmentally friendly ways to transport hydrogen, but hydrogen molecules in the transport medium adsorb onto the inner wall of steel pipes through processes such as dissociation and adsorption, negatively affecting the mechanical properties of the pipes and ultimately shortening their service life. Therefore, research into hydrogen permeability is of great significance for solving the problem of hydrogen-induced failure in pipeline steel. This paper provides a brief overview of the development of hydrogen-containing natural gas projects at home and abroad, the adsorption process of hydrogen, and the research methods for hydrogen permeability, with a focus on the effects of material surface state, gas pressure, stress, and microstructure on hydrogen permeability behavior.

Keywords hydrogen, hydrogen permeation, factors, steel pipes

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