

Hydrogen absorption induced slow crack growth in austenitic stainless steels for petrochemical pressure vessel industries

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Abstrak

Type 304L and type 309 austenitic stainless steels were tested either by exposed to gaseous hydrogen or undergoing polarized cathodic charging. Slow crack growth by straining was observed in type 304L, and the formation of δ martensite was indicated to be precursor for such cracking. Gross plastic deformation was observed at the tip of the notch, and a single crack grew slowly from this region in a direction approximately perpendicular to the tensile axis. Martensite formation is not a necessary condition for hydrogen embrittlement in the austenitic phase.