

Analysis of tritium transport and trapping in SS316L

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Tritium transport and trapping in SS316L were studied with gas-driven permeation (GDP) experiments performed with hydrogen and thermal desorption spectrometry (TDS) experiments on deuterium-loaded samples. After GDP experiments yielded a purely interstitial diffusion coefficient for hydrogen in SS316L, TDS resulted in complex spectra that seemed to result from several factors outside of bulk diffusion and trapping, in particular surface properties. Several additional experiments were then performed (Pd-coated TDS, XRD, XRF) to try and separate the surface contributions from the bulk contributions.

Based on the results of this analysis, a TDS signal obtained with Pd-coated SS316L is then used to perform a modelling analysis to obtain a diffusion and trapping model that covers permeation and TDS results.

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