

Analyzing Methods of Hydrogen Trapping Sites in Metal Crystals and Relationship between Surface Defects and Hydrogen Absorption

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Abstract

There are several approaches to analyze hydrogen in metal crystals. One is to detect hydrogen-trapping sites, and the other is to measure hydrogen amount of absorption or trapping energy. For the first, autoradiography, autoluminography, hydrogen microprint etc. have been used. The thermal absorption spectrometry (TDS) is an important method for the second. I will introduce these methods, and discuss the merits and demerits.

I have applied autoradiography technique to the different crystal structure Ni₃Al and high-strength steel. Ni₃Al poly-crystal is very simple, but the high-strength steel has complicated structures. Two experiments have distinct results. Especially in the latter, hydrogen was observed clearly around defects, for example grain boundary or boundary between matrix and other inclusion. I will discuss about hydrogen trapping sites and defects