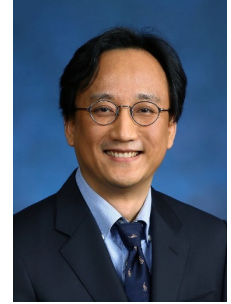


Title **Hydrogen in advanced high strength steels**

Speaker Prof. Dong-Woo Suh
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Date & Time Friday, March 7, 2014 4:00 p.m.

Place I²CNER Hall, Ito campus, Kyushu University

Abstract

Strong steels have a greater tendency to suffer the pernicious effects of hydrogen, with small concentrations present in solution having dramatic effects on properties such as toughness. Hydrogen is legendary for its ability to embrittle, and one manifestation of this is static fracture, i.e. unexpected failure after a component has been in service for a period well below its design life. Resistance to hydrogen-induced static fracture is now a basic acceptance criterion in the exploitation of strong automotive-steels, and this fracture mechanism is a prime suspect in the occurrence of early failures in large bearings for wind turbines.

Austenitic, twinning-induced plasticity steels that are rich in manganese have impressive combinations of strength and ductility that are attractive for applications in the automotive industries. However, there have been occasions where the alloys have been found vulnerable to delayed fracture of formed components, an effect often attributed to hydrogen. The problem seems to have been satisfactorily solved by alloying the steel with aluminium, but the underlying mechanism has not sufficiently clear. In this seminar, I will introduce recent activities in our research group on the influence of hydrogen and aluminium in high-manganese twinning-induced plasticity steels, which provide insight into the mechanisms involved, and possibly lead to improved alloys.

About the Speaker

Dr. Dong-Woo Suh is an associate professor with Graduate Institute of Ferrous Technology (GIFT) in POSTECH. After completing his Ph.D. in Seoul National University in Korea in 2000, he was a STA fellow in National Institute of Materials Science (NIMS), Japan in 2001, and a senior researcher in Korea Institute of Materials Science before joining POSTECH in 2009. He has a deep interest in the physical metallurgy of strong steels and in the development of methods for structure control. The goal is to understand phase transformations and exploit knowledge to create novel alloys on iron.

Host: Professor Setsuo Takaki

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