In this issue

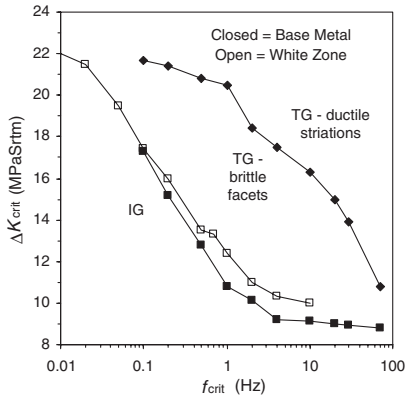
Meryl M. Hall, Jr.

Effect of cyclic frequency on fracture mode transitions during corrosion fatigue cracking of an Al-Zn-Mg-Cu alloy

DOI 10.1515/corrrev-2015-0045
Corros Rev 2015; 33(6): 315–334

Original article: A time-domain analysis is used to gain insight into the critical conditions of cyclic frequency, alternating stress intensity factor, interfacial hydrogen coverage and crack velocity necessary for transitions in fracture modes to occur.

Keywords: aluminum alloy; corrosion fatigue; crack path; hydrogen embrittlement; modeling.



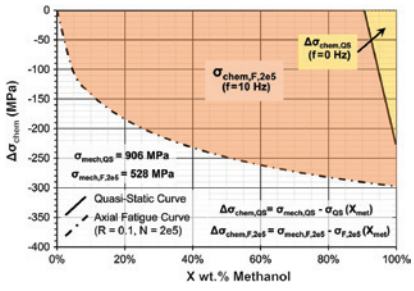
Sergio Baragetti, Riccardo Gerosa and Francesco Villa

Quasi-static behavior of notched Ti-6Al-4V specimens in water-methanol solution

DOI 10.1515/corrrev-2015-0041
Corros Rev 2015; 33(6): 477–485

Original article: Chemical effects on the mechanical strength of the Ti-6Al-4V titanium alloy, caused by the methanol-water environment, limit stress chemical drop $\Delta\sigma_{chem}$ from the corrosion fatigue tests at 200,000 cycles, 10 Hz vs. quasi-static SCC behavior at 0 Hz.

Keywords: corrosion fatigue; methanol; microhardness; stress corrosion cracking; Ti-6Al-4V.



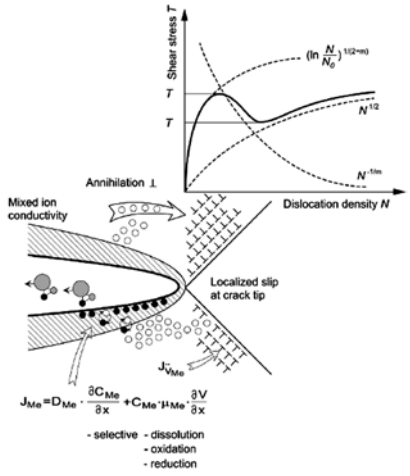
Pertti Aaltonen, Yuriy Yagodzinskyy, Tapio Saukkonen, Simo Kilpeläinen, Filip Tuomisto and Hannu Hänninen

Role of excessive vacancies in transgranular stress corrosion cracking of pure copper

DOI 10.1515/corrrev-2015-0047
Corros Rev 2015; 33(6): 487–500

Original article: The role of excessive metal vacancy generation in transgranular stress corrosion cracking of pure copper in nitrite solutions at ambient temperature is analyzed and discussed.

Keywords: copper; cuprous oxide film; positron annihilation spectroscopy; stress corrosion cracking; vacancy.



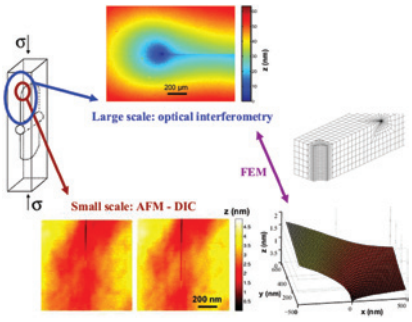
Gaël Pallares, Matthieu George, Laurent Ponson, Stéphane Chapuliot, Stéphane Roux and Matteo Ciccotti

Multiscale investigation of stress-corrosion crack propagation mechanisms in oxide glasses

DOI 10.1515/corrrev-2015-0040
Corros Rev 2015; 33(6): 501–514

Original article: Multiscale investigation of the slow crack growth of a sharp crack in oxide glasses in the stress-corrosion regime, combining experimental and numerical analyses of the displacement fields from the millimeter scale to the nanoscale range.

Keywords: atomic force microscopy; digital image correlation; glass plasticity; multiscale mechanical analysis; stress-corrosion.



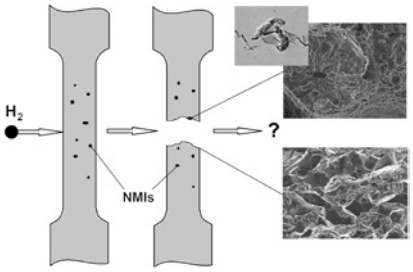
Olga Todoshchenko, Yuriy Yagodzinskyy, Valentina Yagodzinska, Tapio Saukkonen and Hannu Hänninen

Hydrogen effects on fracture of high-strength steels with different micro-alloying

DOI 10.1515/corrrev-2015-0044
Corros Rev 2015; 33(6): 515–527

Original article: The role of micro-alloying of high-strength carbon steels in hydrogen embrittlement resistance and character of hydrogen-induced fracture is discussed.

Keywords: fracture; high-strength steels; hydrogen embrittlement; non-metallic inclusions.



Masatake Yamaguchi, Ken-ichi Ebihara and Mitsuhiro Itakura

Multiscale thermodynamic analysis on hydrogen-induced intergranular cracking in an alloy steel with segregated solutes

DOI 10.1515/corrrev-2015-0039
Corros Rev 2015; 33(6): 547–557

Original article: The relationship of threshold stress intensity factor (K_{th}) to hydrogen content in iron lattice (C_H) in the intergranular cracking of an alloy steel was investigated by the combined analysis with first-principles calculations of mobile hydrogen decohesion and two kinds of fracture mechanics experiments.

Keywords: first-principles calculations; hydrogen-induced intergranular embrittlement; mobile hydrogen; steel; threshold stress intensity factor.