

acetic acid 가 pH 3.21~5 3.5NiCrMoV

The Susceptibility of Stress Corrosion Cracking of 3.5NiCrMoV steel between pH3.21~pH5 using acetic acid

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1.

(SCC)

Hinkey Point A

가 [1].

keyway (SCC)

가 가

[2].

(IGSCC), 가 가 (branched),

가 NaOH (SCC)

[3-5].

[6].

acetic acid 가 pH

2.

가 hastelloy C-276 autoclave (slow

strain rate technique ;SSRT) 8mm² (4mm×2

mm) , 25mm

Toshin SERT-C-5000 가

가 (purging) 10

ppb (strain rate) 1.00×10⁻⁷ s⁻¹ . pH

pH3.2~5.0 150 가

scanning electron microscope (SEM)

3.

acetic acid 가 turbine steel
 pH3.21~5.00 autoclave 150 10^{-7}s^{-1}

Fig.1

pH가 가 Fig.2
 , pH4.95 15.2% , pH가
 pH3.21 9.6%
 pH가 SCC 가 Fig.3 pH
 SCC . pH3.50 SCC pH5.0 5 가

4.

pH가 , SCC 가
 가 가 3.5NiCrMoV SCC 가

- 1) J. H. Hodge and I. L. Mogford, "U.K. Experience of Stress Corrosion Cracking in Steam Turbine Discs," Proc. Inst. Mech. Eng., 193, p.95-109, 1979
- 2) F. F. Lyle, Jr., "Stress Corrosion Cracking in Low Pressure Steam Turbines," Corrosion 94, 1994
- 3) A. MCMINN, F. F. LYLE, JR., and G. R. LEVERANT, "Stress Corrosion Crack Growth in NiCrMoV Turbine Disc Steels", CORROSION Vol41, p.493~502,1985
- 4) FRED F. LYLE, JR., "Stress Corrosion Cracking Characterization of 3.5 NiCrMoV Low Pressure Turbine Rotor Steels in NaOH and NaCl Solutions", CORROSION Vol.39, p.120~131, 1983
- 5) R. S. SHALVOY, "The Effect of Potential and Caustic Concentration on the Stress Corrosion Cracking of NiCrMoV Steel at 100 C", CORROSION Vol.39, p. 66~70, 1983
- 6) Jean Marie GRAS, Francois VAILLANT, Michel DORDONAT, Jean Philippe DURY, "Stress Corrosion Cracking of Turbine Disc Steel: A

Study of Mechanism”, Six International Symposium on Environmental Degradation of Materials in Nuclear Power Systems- Water Reactors, pp.131-134, 1993

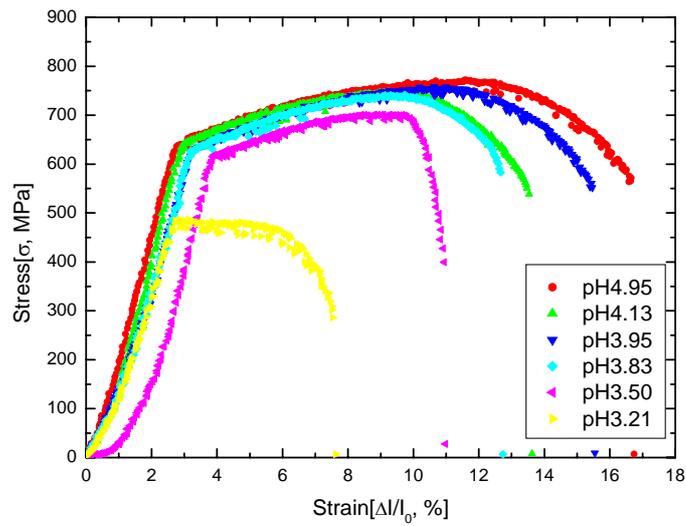


Fig. 1. Strain-stress curves produced from data recorded during SSRT test in acetic acid solution with 10^{-7} s^{-1} at 150

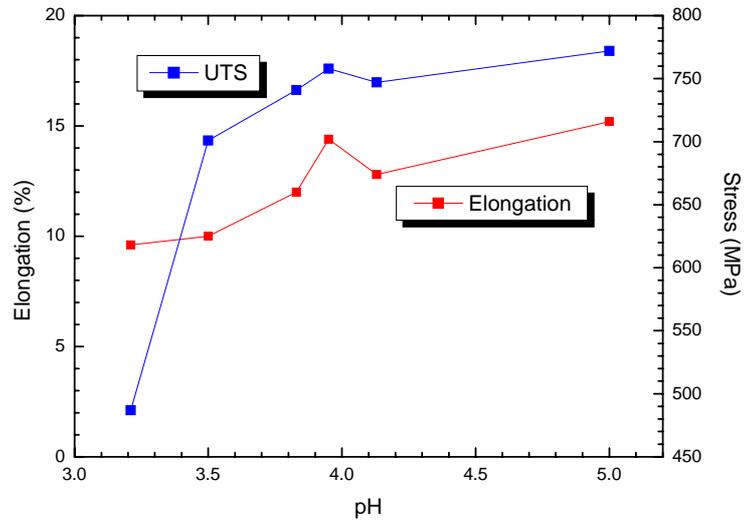


Fig. 2. UTS & elongation after SSRT test in acetic acid solution in 10ppb O₂ with 10^{-7} s^{-1} at 150

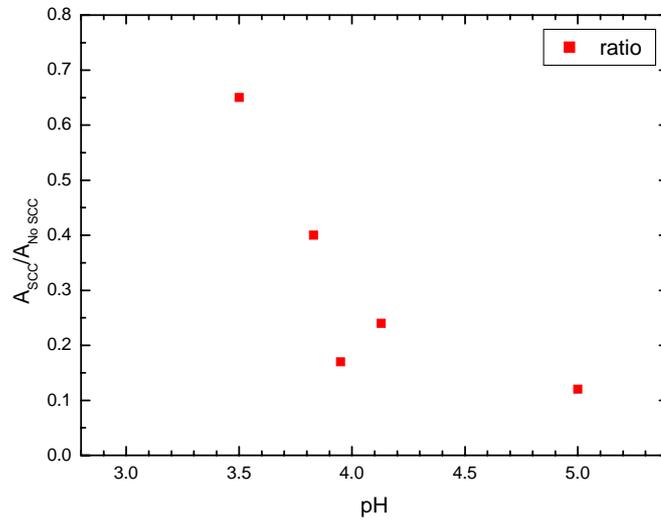


Fig. 3. Fracture area ratio after SSRT test in acetic acid solution in 10ppb O₂ with 10^{-7} s^{-1} at 150