

Scratch type repassivation technique at high temperature

150

(Korea Atomic Energy Research Institute)

300
autoclave,

, 300 alloy 600
alloy 600 SCC 가

가

Abstract

KAERI(Korea Atomic Energy Research Institute) developed a repassivation rate test system which can be operated at 300 . It consists of an autoclave, three electrodes for an electrochemical test and a scratch tip. Good repassivation curves of alloy 600 at 300 were obtained. The system would be a good tool to evaluate a SCC susceptibility of alloy 600 at high temperature.

1.

(Stress Corrosion Cracking, SCC)

가

SCC

가

alloy600 SCC 가

1 - 4), 5 - 7),
8 - 10), 4 - 11 - 12), 13 - 15), 16 - 18),
19 - 21), alloy 600 SCC 가

, 300

, ally 600 SCC

가

2.

(Korea Atomic Energy Research Institute) Fig.1.1

, 300

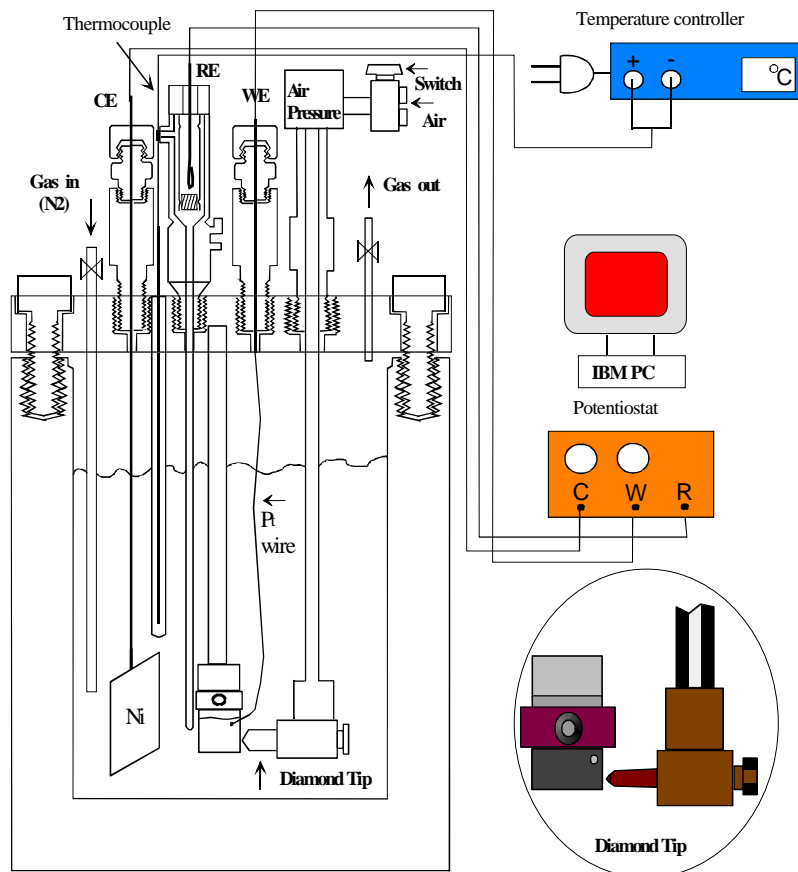


Fig.1. High temperature operated Scratching electrode type repassivation test system

Fig.1.

silver/silver

RE (Reference Electrode)

Ni plate CE (Counter Electrode) Fig.1.

Alloy 600 0.5Ö Pt wire

WE (Working Electrode), EG&G 263A potentiostat IBM PC

Diamond Scratch Tip TEFLON

Working Electrode Zirconium plates

TEFLON sheet 12mm X 10mm

Alloy 600HTMA #600 Sic 0.5Ö

(high temp silicone sealant)

(heat shrinkable Teflon tube) , CONAX Glands

autoclave wire pH10 pH 13

NaOH 99.99% 가 1

Temp.contoller

가 300 가 3600

+150 mV

4

Diamond Scratch Tip , 1 1000 Data

Points EG&G 263A potentiostat

IBM PC M352 corrosion software

Table. 1 Alloy 600

Element	C	Si	Mn	P	S	Cr	Ni	Mo	Co	Ti	Cu
Alloy							Al	Nb	B	N	Fe
600HTMA	0.026	0.33	0.83	0.007	0.001	16.81	72.4	-	0.010	0.36	0.010
							0.16		0.0010	0.018	9.01

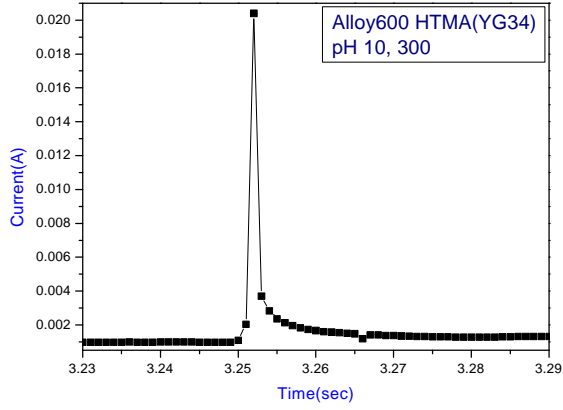
Table. 1. Chemical composition of the specimens

3.

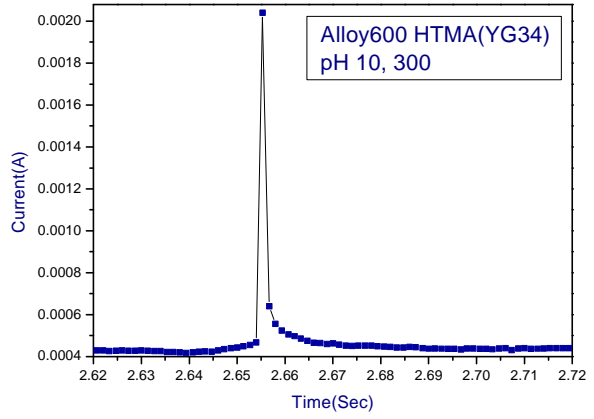
Fig.2. pH 10 pH 13 NaOH alloy 600

Scratch 가 가 가 가 0.01

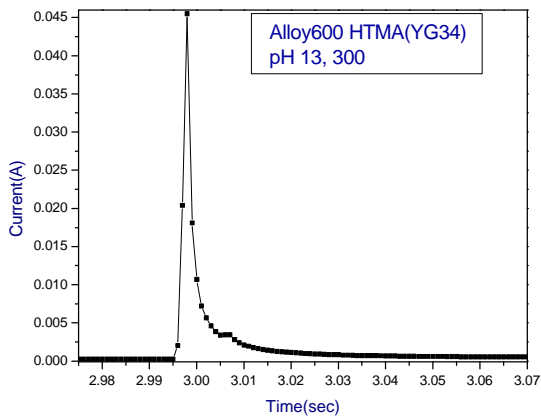
가 가



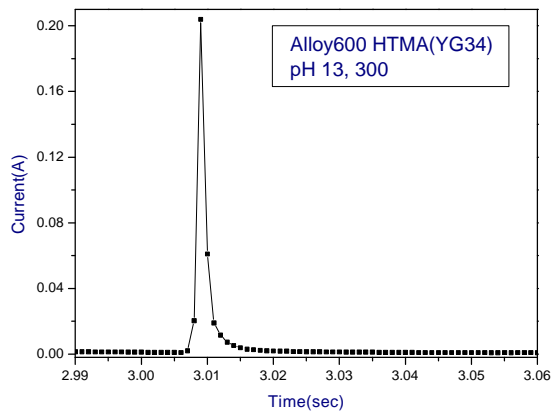
(a)



(b)



(c)



(d)

Fig. 2. Repassivation behaviors of alloy 600 in pH 10 and pH 13 water at 300 .

Fig.3. pH 가 가 ,
 pH 10 pH 13 NaOH alloy 600
 pH 13 pH 10
 가 가 , SCC
 가 .

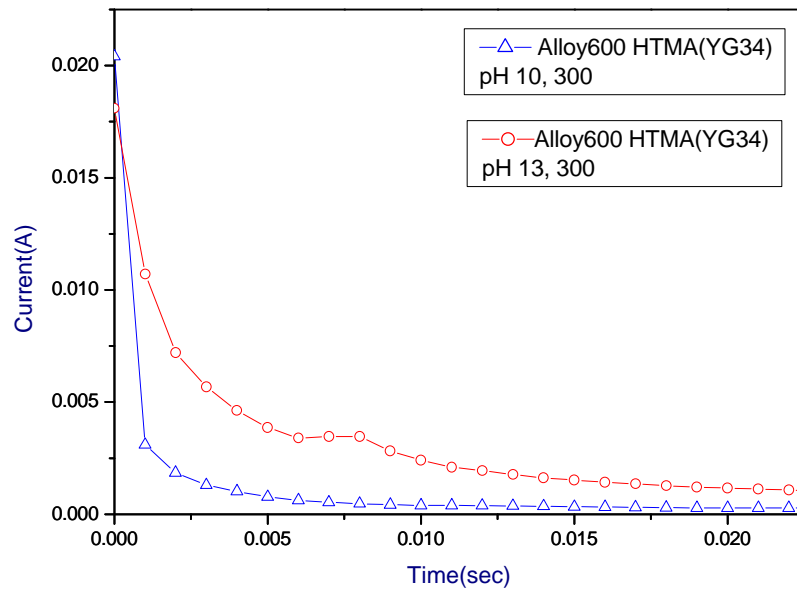


Fig. 3. Repassivation of the alloy 600 in pH 10 , pH 13.

4.

- 300

- pH 10 pH 13 NaOH Alloy 600

- alloy 600 SCC 가
 , SCC (Stress Corrosion Cracking)
 가

References

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