

sufficient time was required to complete dehydriding at 550 .

1.

가 (heavy water) (tritium) 가

, 4 가 (Tritium Removal Facility)가 99% 가 , 가 hydride hydride

[1]. 가

가 . zirconium, titanium, hafnium yttrium

[2]. titanium zirconium

25°C 10⁻¹⁵ Pa hydride 500°C 5 kPa , 1000°C

100 Pa yttrium erbium hydride 1000°C

zirconium hydride 가 titanium , erbium

yttrium hydride 가 가

titanium zirconium

titanium [3].

가 titanium sponge

2.

titanium sponge Aldrich 99.5%

, 2-12mm . hydriding

Fig.1 . stainless steel

1×10^{-6} torr
 rotary pump
 TMP (turbo molecular pump)
 welded bellows-sealed valve
 Baratron
 gauge (0-2,1000 torr)
 reference
 volume 510cc 가 10 liter
 가 manifold volume 267cc

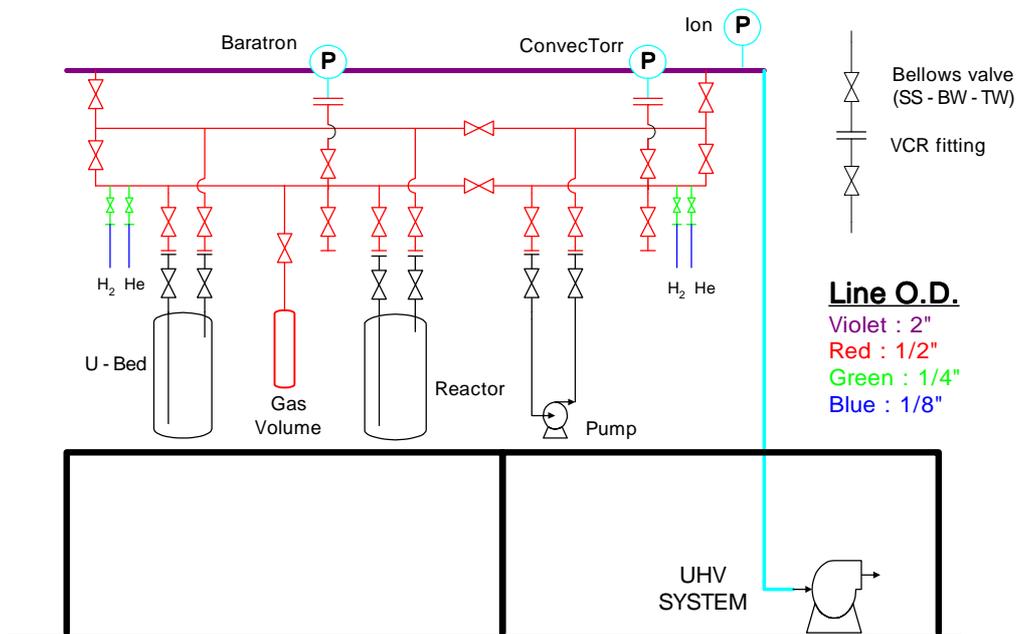


Fig. 1. Experimental apparatus for the metal-hydriding reaction

SUS 316
 flange
 2.1cm, 20cm tube 2 μm
 SUS filter VCR
 male nut Fig.1
 500
 600 torr
 10 liter manifold
 가 Baratron gauge

digital thermometer
Labview software on-line

3.

3-1

titanium sponge
Fig.2
titanium sponge (vacuum
annealing) hydriding
가 sponge hydriding
300 - 800°C, 2hr
1x10⁻⁶ torr
600torr hydriding
titanium sponge (H/Ti) 300°C
, 350°C
400°C hydriding
titanium sponge
[4].
500°C

titanium sponge
Fig.3
titanium sponge 가 600torr
(H/Ti) 가
, 500°C
10
2 (H/U) 1.95

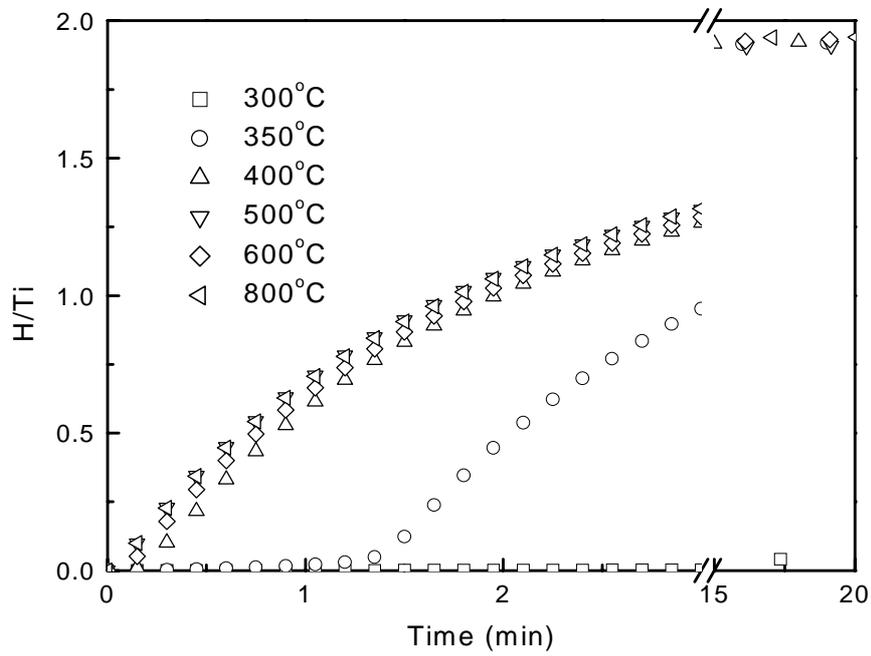


Fig.2. The effect of activation temperature

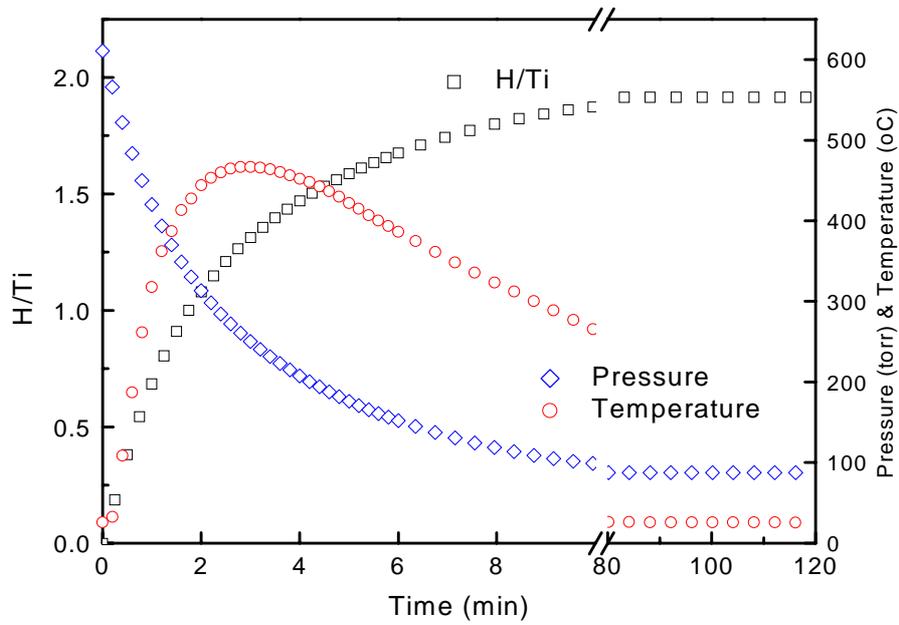


Fig.3. Loading hydrogen to titanium sponge bed

3-2

hydridding Fig.4
volume manifold 200 800torr
H/Ti 0 가
가
manifold 15g
510torr 가 hydridding 가 가
hydridding

hydridding rate Fig.5
(H/Ti)
H/Ti=0.1
가 가
batch 가 가

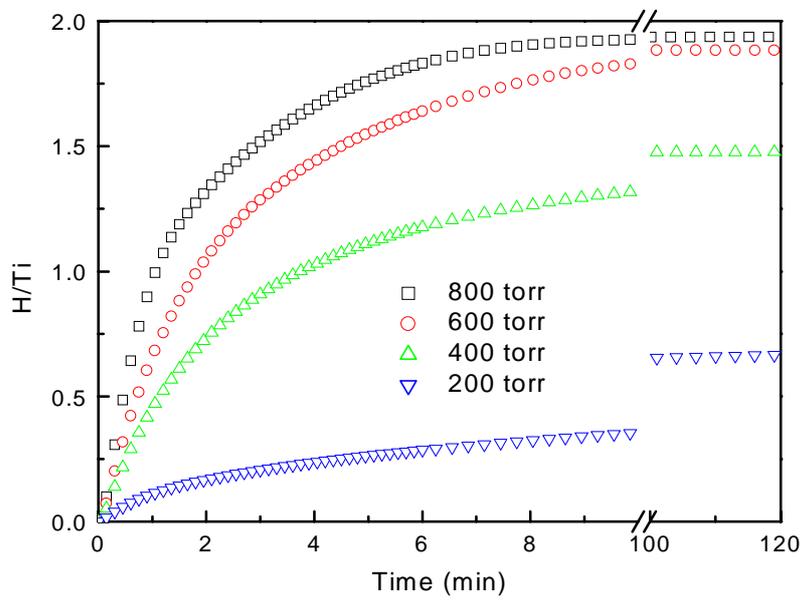


Fig.4. Hydridding rate dependence on initial pressure

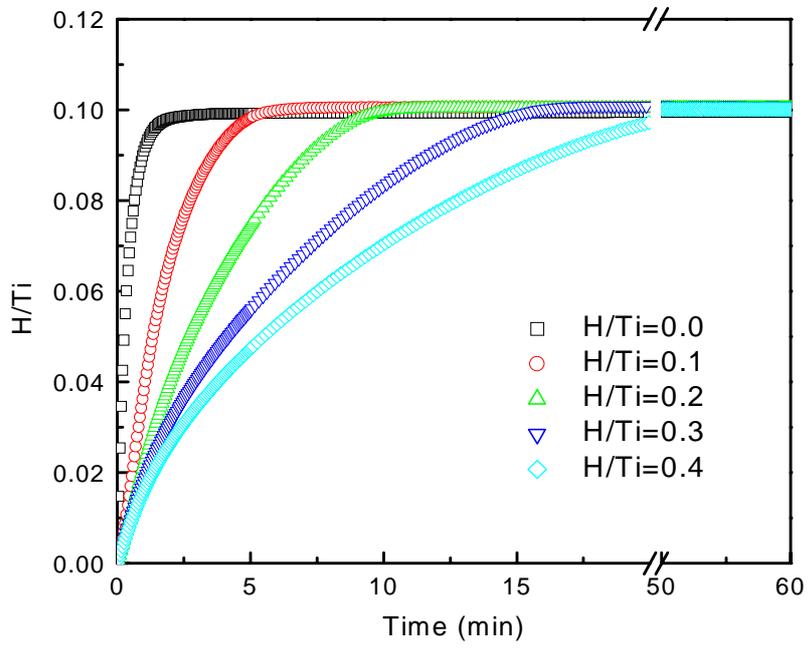


Fig.5. Hydriding rate dependence on initial hydrogen contents(H/Ti)

H/Ti=1.0 H/Ti=2.0

. Fig.6

가

가

He³ . Fig.7

(0.6%) 가

가 가 가

[5].

가

가

[6].

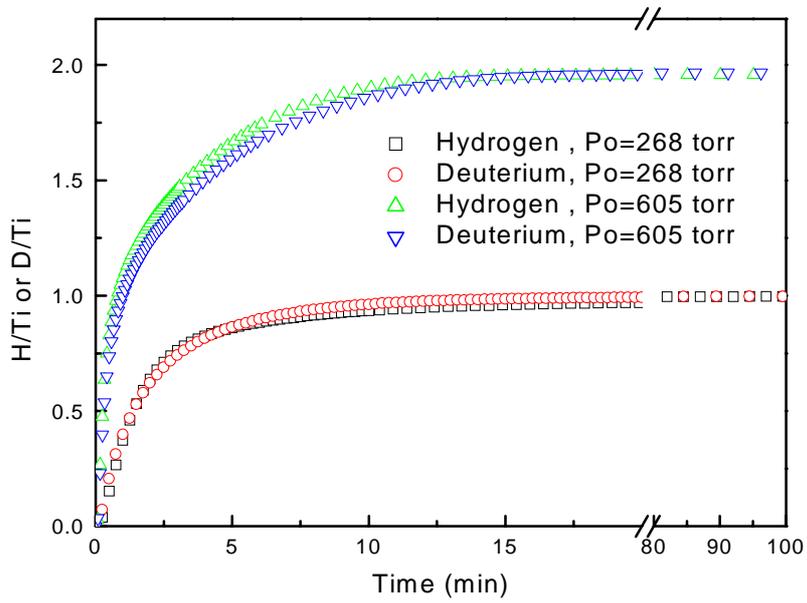


Fig.6. Isotopic effects for the hydriding reaction

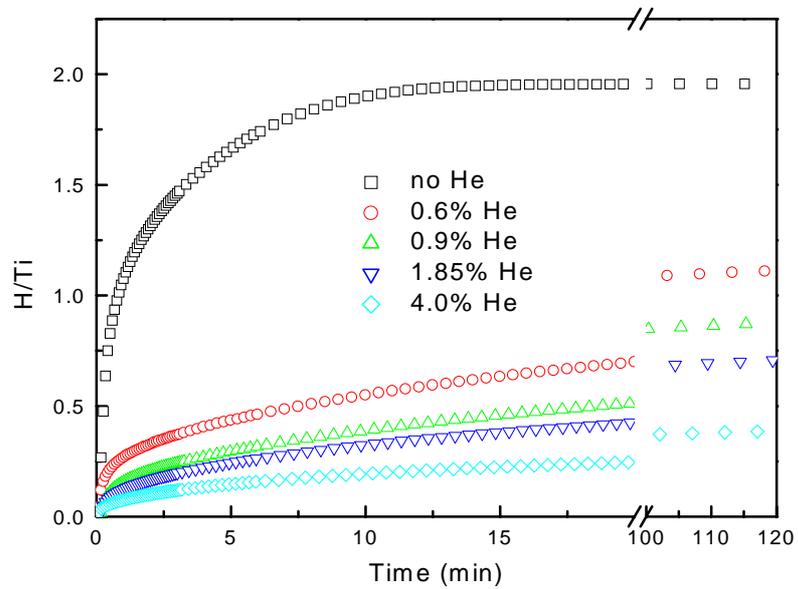


Fig.7. Effect of helium content on hydriding reaction

가 (dehydrating) 가
 (H/Ti=1.0 and H/Ti=1.0) Fig.8
 550°C 가
 200°C H/Ti=1.9 , H/Ti=1.0
 400°C 가
 Kherani 가 (α - β)
 [7].

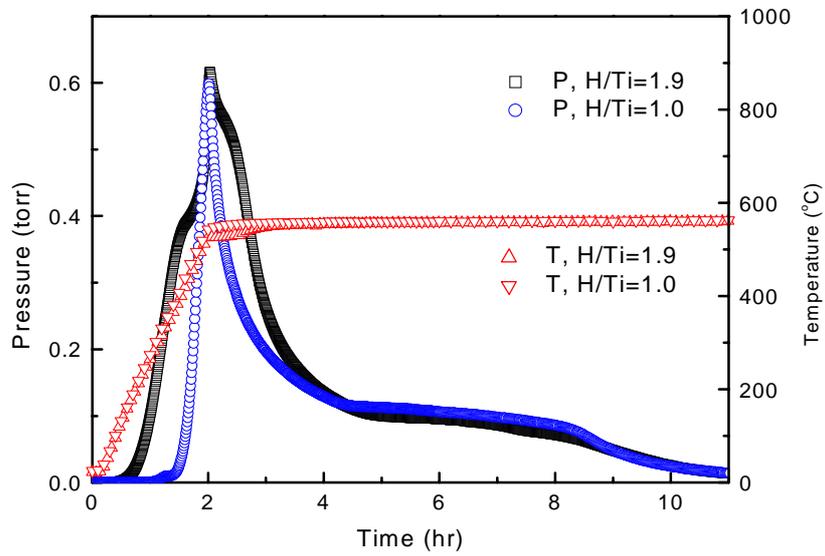


Fig.8. Dehydrating of titanium-hydride

4.

가
 500
 가
 가

가 .

* :

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