



hydrogen was desorbed by heating to 450 .

## 1.

가 (heavy water) (tritium) 가  
[1]. hydride titanium [2,3]. 가 [4,5].  
(IAEA)

## 2.

uranium) (depleted  
25g ,  
99.74wt% , mass spectrometer  
 $U^{235}=0.201$  wt%,  $U^{236}=0.004$  wt%,  $U^{238}=99.794$  wt% .  
hydriding Fig.1  
stainless steel ,  $1 \times 10^{-6}$  Torr .  
rotary pump TMP(turbo molecular pump) ,  
weleded bellows-sealed valve .  
baratron gauge (0-1,000 Torr) . reference  
volume 510cc , 가 10liter  
가 manifold volume 189cc .

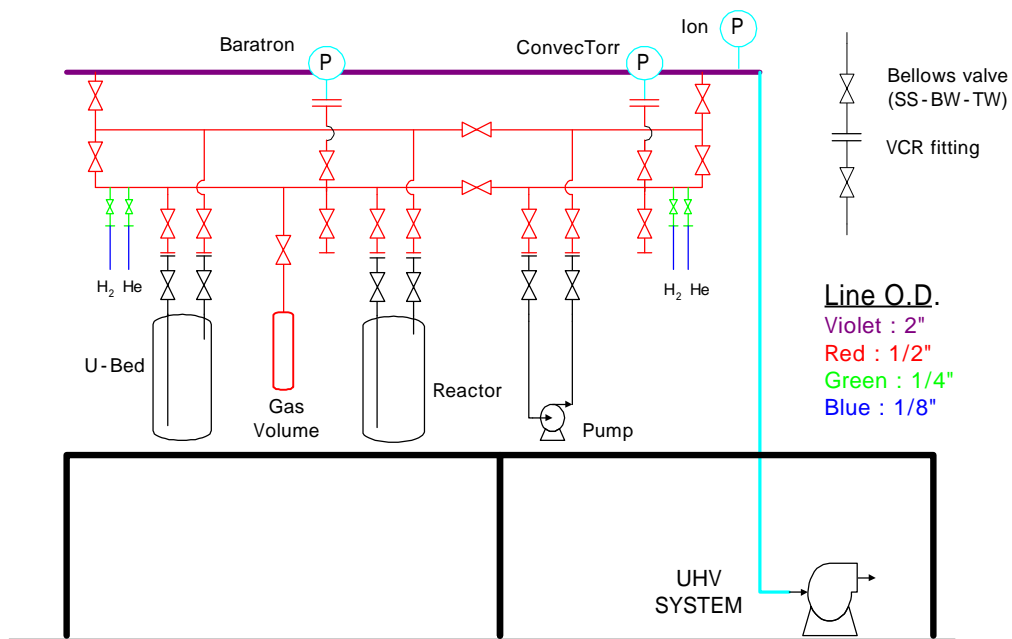


Fig. 1. Experimental apparatus for the metal-hydriding reaction

Fig.2 SUS 316  
 flange  
 2.1cm, 20cm  
 가 1/4" tube  
 tube 2 μm SUS filter  
 VCR male nut

Fig.1  
 450  
 600Torr 10liter manifold  
 가  
 Baratron gauge digital thermometer  
 Labview software on-line

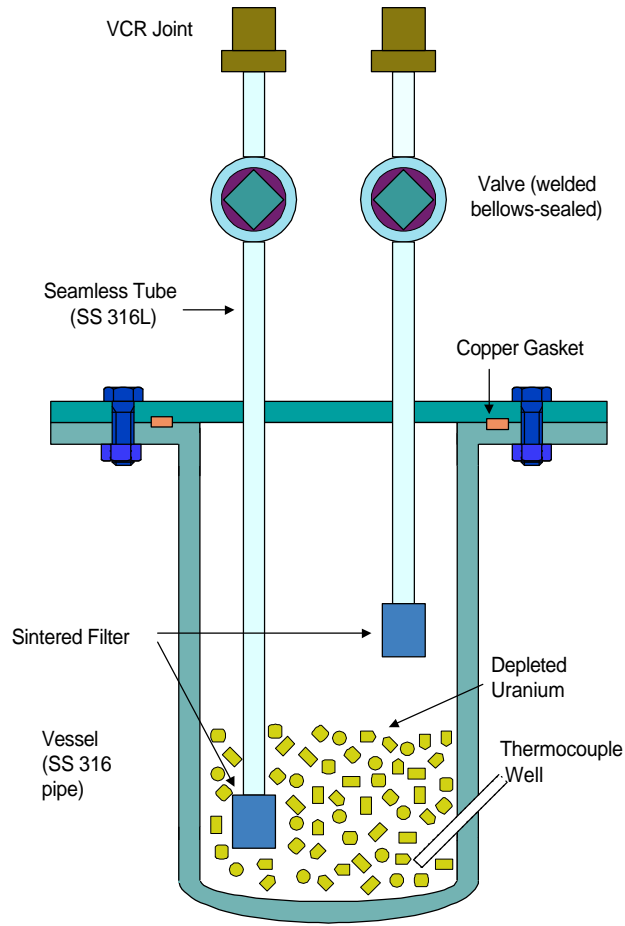


Fig.2. Reaction vessel for the metal-hydriding reaction

3.

3-1

가

-  $1 \times 10^{-6}$  450°C 2

가

- 10liter 450°C 600Torr

- 가

가  
 $1 \times 10^{-6}$   
 Fig.3 가  
 1 100°C  
 H/U 가 2.3 ( 3  
 ) 가  
 H/U 가 2.9  
 가 450°C 가

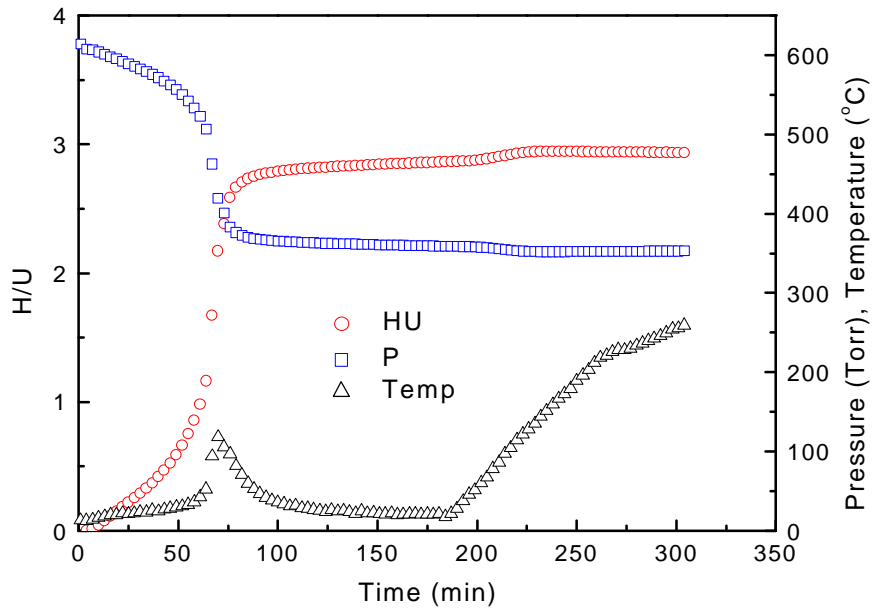


Fig.3. Activation of depleted uranium

3-2

Fig.4  
 500Torr  
 (H/U) 가  
 1 150°C  
 10  
 (H/U) 2.95

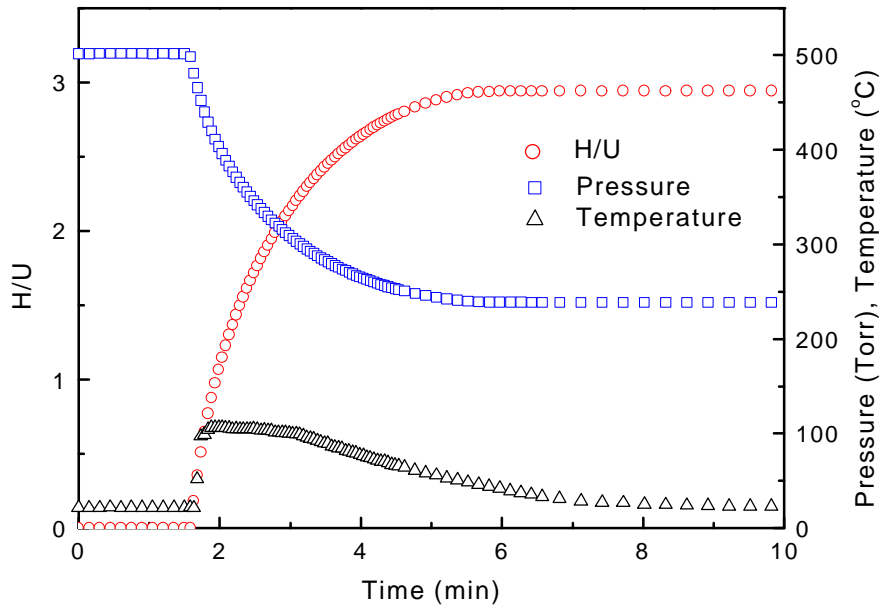


Fig.4. Loading hydrogen to uranium vessel

5

Fig.5

Fig.4

가 , 가 .

가 , 3 .

Fig.6 4 2 5

(H/U) ( ) 5

가

25g

3.5liter

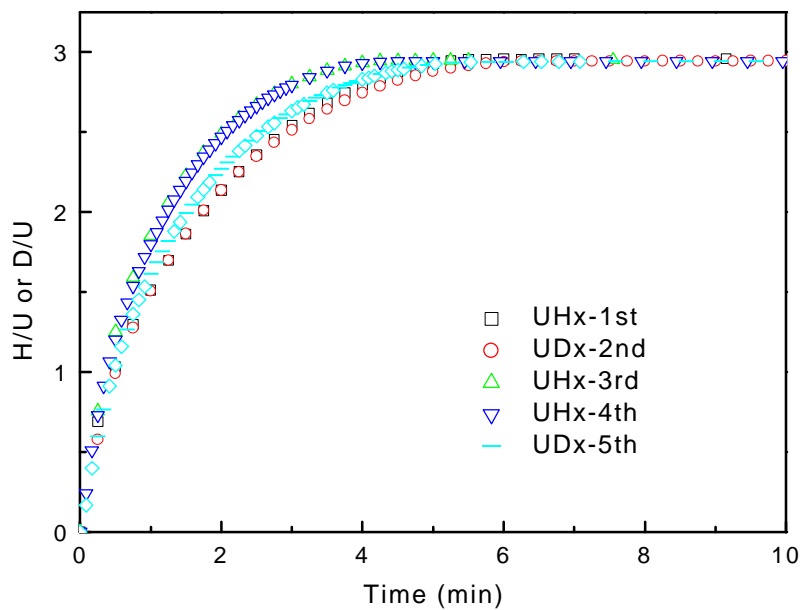


Fig.5. Reproducibility of uranium-hydrogen reaction

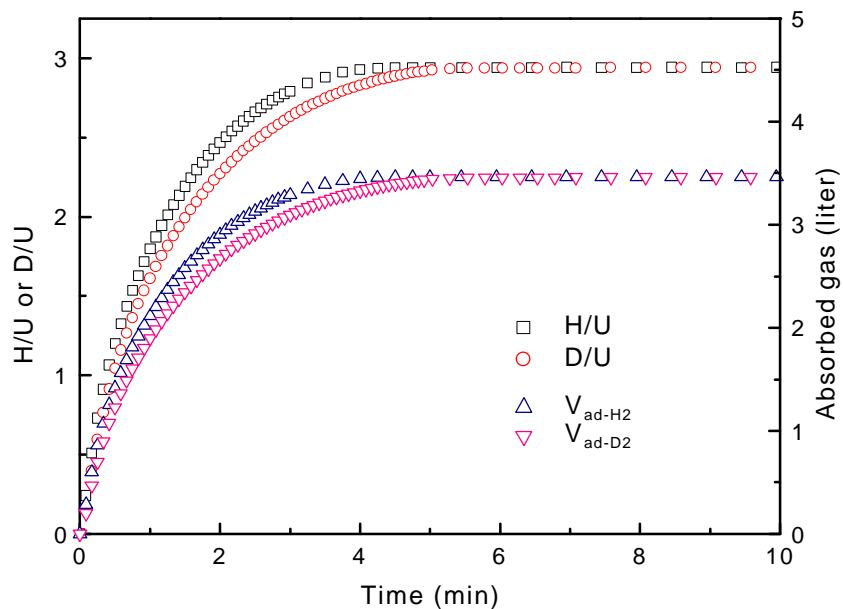


Fig. 6. Absorption of hydrogen and deuterium to uranium





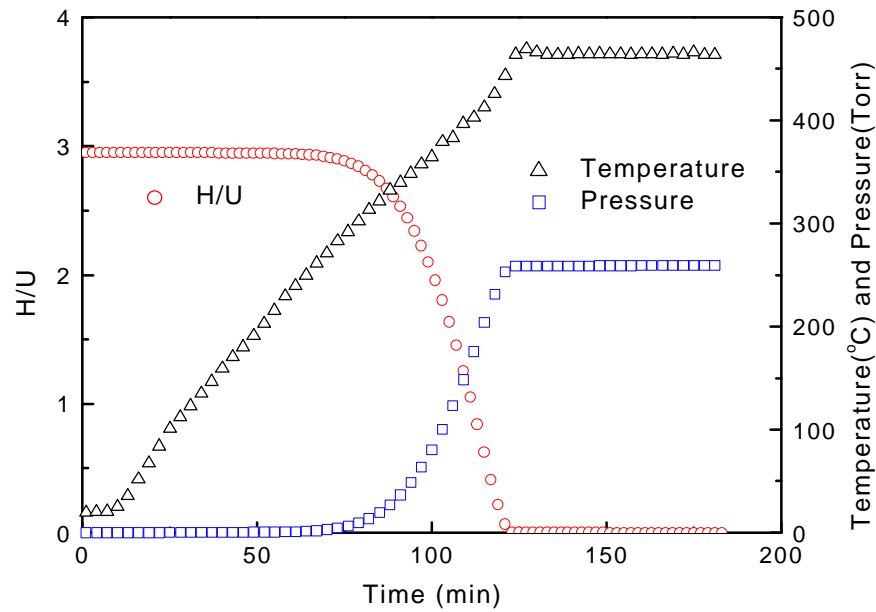


Fig.8. Desorption of hydrogen from uranium

4.

SUS 316  
 450  
 10 (H/U) 2.95  
 , 450 가  
 가

\* :

[1] W.J. Holtslander, AECL-8847 (1985).  
 [2] L.K. Heung, WSRC-MS-94-0491 (1994).  
 [3] W.T. Shimayda and P. Mayer, J. Less-Common Metals, 104, 239-250 (1984).  
 [4] T. Tanabe and S. Imoto, J. Nucl. Sci. Technol., 16(9), 690-696 (1979).  
 [5] J. Bolch and M.H. Mintz, J. Less-Common Metals, 81, 301-320 (1981).