

Safe Storage of Hydrogen Isotopes

, , , , , ,

150

0.5Mci
“ ” “
” “
” “
” “

Abstract

The use of hydrogen isotopes in a PHWR raises particular safety issues due to the combined effects of their physico-chemical properties and radioactive nature. Even if the safe handling of hydrogen isotopes has already been demonstrated, it is unanimously recognized that further efforts are still to be concentrated on the improvement of current concepts. The aim of this article is to verify the most prominent safety related aspects associated with the safe storage and handling of hydrogen isotopes.

1.

가 가 가

가 .

가

가

가

가 1/10,000 - 1/20,000

가

[1-4].

2.

2-1.

가

가

10^{-12} Pa

2.6 mm

가

가

“

” , “

” ,

“

”

SUS 316L

SUS 가

6.5

1.5

850

, TiT

0.5MCi

1



1.

2-2.

Sch40S 1 가 2
Sch20S 2 가 SS304 , 2

2-3.

2mm STS 304 570mm, 980 mm,
1.5mm
1mm
3



2.



3.

2-4.

800 , 30 가 .

800 , 가 3

1/10 가 ,

3 3mm , 4 SS304 가

5mm 가

4 가

10mm , 10mm

가 PE 가 PE 가

Tempilstik™ 4 (500 , 732 , 300 , 400)

800 , 가 가

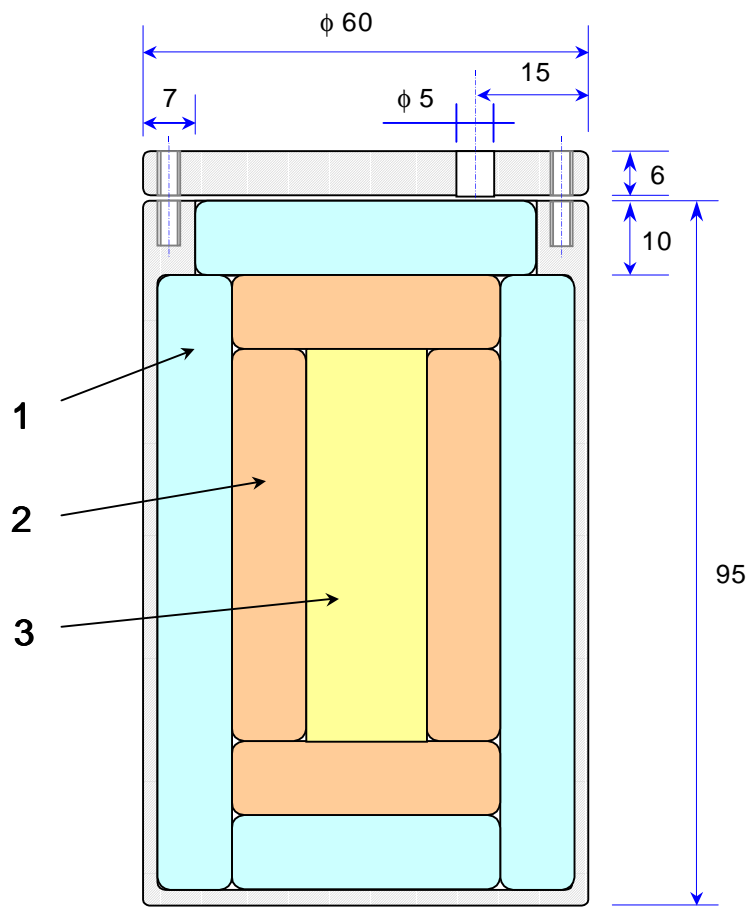
가 PE 5

800 30 가 .

811 가 5 789 801

6 가 . 800

가 가



4.



5.



6. 가 가

, , 1 day
7 가

, 가 PE

600

400 500

가

가

가

가

가

3

가

가

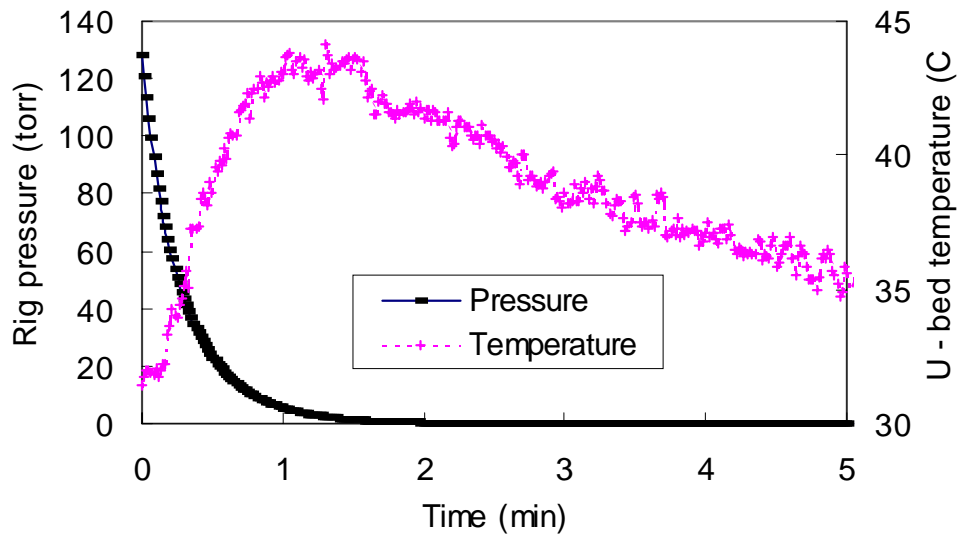
가



7.

3.

rig
glove box rig 가 UHV , gas
feedthrough Ar glove box , Ar
, 가 . Rig
.
1) .
2) ante-chamber glove box .
3) rig .
4) UHV system rig .
5) .
6) .
7) .
8) .
9) Rig U 가 (8 가 128
torr, 238 cc U 가 1g rig U-bed
).
10) , Rig He .



8. Rig

rig

4.

“ ” , “ ” ,
 “ ” , 0.5MCi
 800 30 가
 811 가 5 789 801
 . 800 가 가
 - glove box rig 가
 UHV , gas feedthrough

Ar 가 . Ar ,
. Rig 2
.

5.

1. , “ ”, 15 2 , pp.43-48 (2000)
2. Holtlander, W. J., Drolet, T. S., and Osborane, R. V., *"Recovery of Tritium from CANDU Reactors, Its Storages and Monitoring of its Migration in the Environment"*, AECL-6544 (1979)
3. Holtlander, W. J., and Yaraskavitch, J. M., *"Tritium Immobilization and Packaging using Metal Hydrides"*, AECL-7151 (1981)
4. Perevezentsev, A. N., et. al., *"Safety Aspects of Tritium Storage in Metal Hydride Form"*, Fusion Technology vol. 28, No. 3, Pt. 2, pp.1404-1409 (1995)

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