

PFWR50 (Japan)

Unit cell description

A unit cell has three region such as fuel, cladding, and moderator. In each region, materials of their regions are homogenized. And outer boundary condition is reflective. All nuclear data are based on JENDL3.2. The number of fast group is 61 and the number of thermal group is 46.

Fig.1 Plane view and concept of particle fuel

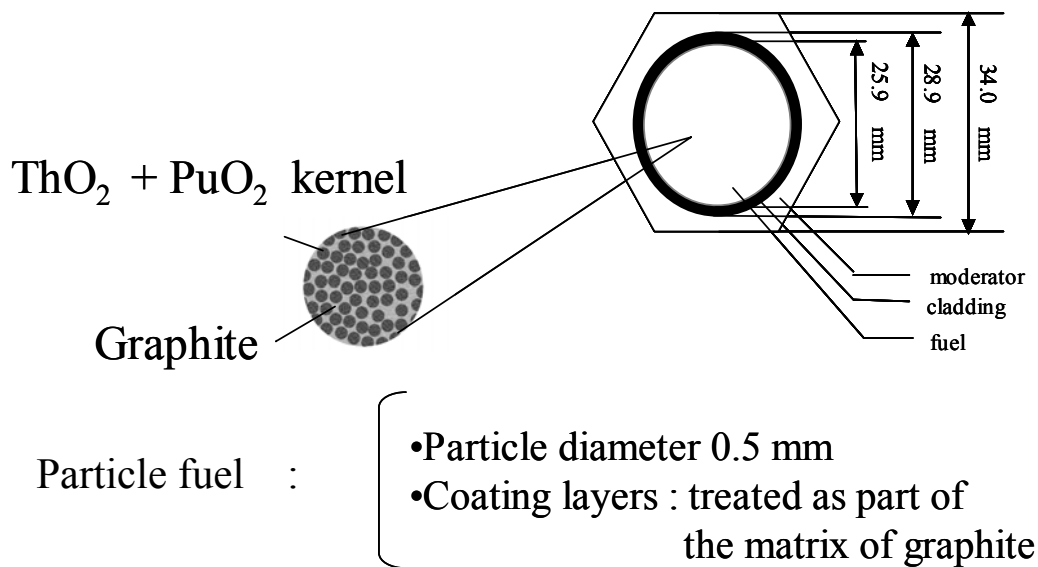


Table 1. Geometry

Geometry	Hexagonal
Fuel rod pitch	34mm
Fuel diameter	25.9mm
Cladding thickness	1.5mm

Table 2. Operation condition

Average fuel temperature	280°C
Average cladding temperature	265°C
Average moderator temperature	250°C
Average linear heat rate	9.1kW/m

1.Fuel : ThO₂ - PuO₂

Table 3. Fuel components(Corrected, June 21, 2006)

Material	Density (g/cm ³)	Weight fraction (wt%)	Volume fraction (vol%)
ThO ₂	10.00	90	20
PuO ₂	11.46	10	
C	1.70	—	80

- Th isotope composition : Thorium-232 100%
- Pu isotopic vector is shown in Table 4.

Table 4. Plutonium vector

Isotope	Weight fraction (wt%)
Pu-238	2
Pu-239	63
Pu-240	19
Pu-241	12
Pu-242	4
Total	100

2.Cladding : Zircaloy**Table 5. Cladding components**

Material	Number density ($\times 10^{24}/\text{cm}^3$)
Zr	4.2672E-02
Fe	1.5450E-04
Cr	9.0126E-05

3.Moderator : Light water**Table 6. Water parameters**

Temperature	250°C
Pressure	8.6MPa