

燃焼度45GW d/tHMのPWR使用済燃料(初期ウラン235濃度は3.9wt%)を照射後5年, 8000年, 十万年経過後の各核種の重量と放射能

* tHM:1tのウラン燃料のことです

(出典: 「使用済軽水炉燃料の核種組成評価」1999日本原研)

https://jopss.jaea.go.jp/pdfdata/JAERI-Research-99-004.pdf

| 核種名 | 1tのU燃料当たり発生 | | | 高レベル廃液 含有 g/tHM | | | | | |
|----------|-------------|-------------|----------------|-----------------|----------|----------|-----------|--------------|--------------|
| | 半減期year | 5年後 g/tHM | 未回収 U,Pu: 1.8% | 5年後 | 8000年後 | 10万年後 | 5年後 | 8000年後 | 10万年後 |
| U 238 | 4468000000 | 927760 | 16699.68 | 16699.68 | 16699.66 | 16699.42 | 2.07.E+08 | 207296238 | 207293279 |
| U 235 | 703800000 | 8290.2 | 149.2236 | 149.22 | 149.22 | 149.21 | 1.19.E+07 | 11909428 | 11908349 |
| Pu 239 | 24100 | 6028.1 | 108.5058 | 108.51 | 86.20 | 6.11 | 2.49.E+11 | 197553610589 | 14012796726 |
| U 236 | 23420000 | 5054.9 | 90.9882 | 90.99 | 90.97 | 90.72 | 2.17.E+08 | 217248748 | 216658013 |
| Pu 240 | 6570 | 2678 | 48.204 | 48.20 | 20.73 | 0.00 | 4.04.E+11 | 173511959209 | 10568007 |
| Cs 137 | 30.17 | 1488 | | 1488.00 | 0.00 | 0.00 | 4.75.E+15 | 0 | 0 |
| Pu 241 | 14.29 | 1322.1 | 23.7978 | 23.80 | 0.00 | 0.00 | 9.12.E+13 | 0 | 0 |
| Zr 99 | 214000 | 1052 | | 1052.00 | 1025.09 | 760.93 | 6.55.E+11 | 63868577596 | 474102756968 |
| Zr 93 | 1500000 | 958.3 | | 958.30 | 954.76 | 915.02 | 9.07.E+10 | 90343251801 | 86582983220 |
| Pu 242 | 373300 | 770.69 | 13.87242 | 13.87 | 13.67 | 11.52 | 2.03.E+09 | 1997108157 | 1683497864 |
| Sr 90 | 28.8 | 634.55 | | 634.55 | 0.00 | 0.00 | 3.23.E+15 | 0 | 0 |
| Np 237 | 2140000 | 632.91 | | 632.91 | 631.27 | 612.74 | 1.65.E+10 | 16429654233 | 15947292031 |
| Cs 135 | 3000000 | 521.74 | | 521.74 | 520.78 | 509.82 | 1.70.E+10 | 16973456636 | 16616467737 |
| Am 241 | 433 | 411.26 | | 411.26 | 0.00 | 0.00 | 5.20.E+13 | 142702094 | 0 |
| Pu 238 | 87.74 | 267.68 | 4.81824 | 4.82 | 0.00 | 0.00 | 3.05.E+12 | 0 | 0 |
| I 129 | 16000000 | 241.53 | | 241.53 | 241.45 | 240.49 | 1.54.E+09 | 1544133356 | 1537991312 |
| U 234 | 245000 | 195.42 | 3.51756 | 3.52 | 3.44 | 2.65 | 8.10.E+08 | 791778952 | 610329157 |
| Am 243 | 7370 | 170.83 | | 170.83 | 80.50 | 0.01 | 1.26.E+12 | 593337454998 | 103641212 |
| Pd 107 | 6500000 | 122 | | 122.00 | 121.90 | 120.71 | 2.32.E+09 | 2313482023 | 2290896121 |
| Pm 147 | 2.6234 | 57.393 | | 57.39 | 0.00 | 0.00 | 1.96.E+15 | 0 | 0 |
| Cm 244 | 18.11 | 55.699 | | 55.70 | 0.00 | 0.00 | 1.66.E+14 | 0 | 0 |
| Cs 134 | 2.062 | 36.256 | | 36.26 | 0.00 | 0.00 | 1.73.E+15 | 0 | 0 |
| Kr 85 | 10.7 | 22.262 | | 22.26 | 0.00 | 0.00 | 3.23.E+14 | 0 | 0 |
| Eu 154 | 8.5 | 19.36 | | 19.36 | 0.00 | 0.00 | 1.95.E+14 | 0 | 0 |
| Sm 151 | 90 | 14.223 | | 14.22 | 0.00 | 0.00 | 1.38.E+13 | 0 | 0 |
| Ru 106 | 1 | 7.127 | | 7.13 | 0.00 | 0.00 | 8.88.E+14 | 0 | 0 |
| Se 79 | 65000 | 6.1546 | | 6.15 | 5.65 | 2.12 | 1.58.E+10 | 14527251999 | 5446408922 |
| Eu 155 | 4.9 | 5.2288 | | 5.23 | 0.00 | 0.00 | 9.09.E+13 | 0 | 0 |
| Cm 245 | 8500 | 4.9297 | | 4.93 | 2.57 | 0.00 | 3.12.E+10 | 16273728382 | 8980077 |
| Ce 144 | 0.778 | 4.8433 | | 4.84 | 0.00 | 0.00 | 5.71.E+14 | 0 | 0 |
| Sb 125 | 2.7 | 2.8322 | | 2.83 | 0.00 | 0.00 | 1.11.E+14 | 0 | 0 |
| In 115 | 5.1E+14 | 1.705 | | 1.71 | 1.70 | 0.00 | 3.84.E-01 | 0 | 0 |
| Am 242 m | 152 | 0.79366 | | 0.79 | 0.00 | 0.00 | 2.85.E+11 | 0 | 0 |
| Cm 246 | 4700 | 0.51098 | | 0.51 | 0.16 | 0.00 | 5.83.E+09 | 1792888932 | 2296 |
| Cm 243 | 28.5 | 0.46801 | | 0.47 | 0.00 | 0.00 | 8.92.E+11 | 0 | 0 |
| Y 90 | 0.0073 | 0.16288 | | 0.16 | 0.00 | 0.00 | 3.27.E+15 | 0 | 0 |
| Cd 113 m | 14 | 0.14458 | | 0.14 | 0.00 | 0.00 | 1.21.E+12 | 0 | 0 |
| Tc 98 | 4200000 | 0.011333 | | 0.01 | 0.01 | 0.01 | 3.63.E+05 | 362969 | 357500 |
| Cm 242 | 0.446 | 0.010732 | | 0.01 | 0.00 | 0.00 | 1.31.E+12 | 0 | 0 |
| Eu 152 | 13 | 0.0107155 | | 0.01 | 0.00 | 0.00 | 7.16.E+10 | 0 | 0 |
| Ag 110 m | 0.69 | 0.010574 | | 0.01 | 0.00 | 0.00 | 1.84.E+12 | 0 | 0 |
| Pm 146 | 5.5 | 0.0047952 | | 0.00 | 0.00 | 0.00 | 7.88.E+10 | 0 | 0 |
| Th 230 | 80000 | 0.0041011 | | 0.00 | 0.00 | 0.00 | 2.94.E+06 | 2745070 | 1236998 |
| Nb 94 | 20000 | 0.0016969 | | 0.00 | 0.00 | 0.00 | 1.19.E+07 | 9029430 | 372325 |
| Th 232 | 1.41E+10 | 0.0010404 | | 0.00 | 0.00 | 0.00 | 4.20.E+00 | 4 | 4 |
| Rh 102 | 2.9 | 0.00085409 | | 0.00 | 0.00 | 0.00 | 3.81.E+10 | 0 | 0 |
| Pa 231 | 32800 | 0.00060693 | | 0.00 | 0.00 | 0.00 | 1.06.E+06 | 892904 | 127777 |
| C 14 | 5730 | 0.00026378 | | 0.00 | 0.00 | 0.00 | 4.34.E+07 | 16490998 | 242 |
| Pr 144 | 0.0000329 | 0.00020451 | | 0.00 | 0.00 | 0.00 | 5.70.E+14 | 0 | 0 |
| Np 239 | 0.0064 | 0.00014681 | | 0.00 | 0.00 | 0.00 | 1.27.E+12 | 0 | 0 |
| Be 10 | 1600000 | 0.00010157 | | 0.00 | 0.00 | 0.00 | 8.38.E+04 | 83505 | 80243 |
| Th 228 | 1.9131 | 0.000054388 | | 0.00 | 0.00 | 0.00 | 1.65.E+09 | 0 | 0 |
| Pa 233 | 0.0739 | 0.000021497 | | 0.00 | 0.00 | 0.00 | 1.65.E+10 | 0 | 0 |
| Th 234 | 0.066 | 0.000013469 | | 0.00 | 0.00 | 0.00 | 1.15.E+10 | 0 | 0 |
| Te 127 m | 0.298 | 6.1375E-06 | | 0.00 | 0.00 | 0.00 | 2.14.E+09 | 0 | 0 |
| Th 229 | 7300 | 1.5942E-06 | | 0.00 | 0.00 | 0.00 | 1.26.E+04 | 5889 | 1 |
| Ra 224 | 0.01 | 2.7989E-07 | | 0.00 | 0.00 | 0.00 | 1.65.E+09 | 0 | 0 |
| Nb 95 | 0.0958 | 2.3467E-07 | | 0.00 | 0.00 | 0.00 | 3.40.E+08 | 0 | 0 |
| Zr 95 | 0.175 | 1.9515E-07 | | 0.00 | 0.00 | 0.00 | 1.55.E+08 | 0 | 0 |
| Ra 226 | 1600 | 1.4754E-07 | | 0.00 | 0.00 | 0.00 | 5.39.E+03 | 168 | 0 |
| Ac 227 | 21.773 | 6.2076E-08 | | 0.00 | 0.00 | 0.00 | 1.66.E+05 | 0 | 0 |
| Th 231 | 0.0029 | 3.3708E-08 | | 0.00 | 0.00 | 0.00 | 6.64.E+08 | 0 | 0 |
| Y 91 | 58.5 | 1.7884E-08 | | 0.00 | 0.00 | 0.00 | 4.43.E+04 | 0 | 0 |
| Tb 160 | 0.197 | 2.9247E-09 | | 0.00 | 0.00 | 0.00 | 1.22.E+06 | 0 | 0 |
| Tm 170 | 0.352 | 2.7304E-09 | | 0.00 | 0.00 | 0.00 | 6.02.E+05 | 0 | 0 |
| Sr 89 | 0.138 | 3.6539E-10 | | 0.00 | 0.00 | 0.00 | 3.93.E+05 | 0 | 0 |
| Pb 210 | 22.3 | 1.5965E-10 | | 0.00 | 0.00 | 0.00 | 4.50.E+02 | 0 | 0 |
| Ra 223 | 0.03132 | 8.7697E-11 | | 0.00 | 0.00 | 0.00 | 1.66.E+05 | 0 | 0 |
| Sb 124 | 0.165 | 3.7674E-11 | | 0.00 | 0.00 | 0.00 | 2.43.E+04 | 0 | 0 |
| Ra 225 | 0.0405 | 8.6505E-12 | | 0.00 | 0.00 | 0.00 | 1.25.E+04 | 0 | 0 |
| Ac 225 | 0.0274 | 5.8436E-12 | | 0.00 | 0.00 | 0.00 | 1.25.E+04 | 0 | 0 |
| Po 210 | 0.379 | 2.7135E-12 | | 0.00 | 0.00 | 0.00 | 4.50.E+02 | 0 | 0 |
| H 3 | 12.33 | 1.0002E-12 | | 0.00 | 0.00 | 0.00 | 3.57.E+02 | 0 | 0 |
| Ru 103 | 0.108 | 6.0388E-13 | | 0.00 | 0.00 | 0.00 | 7.17.E+02 | 0 | 0 |
| Rh 103 m | 0.0000019 | 6.0528E-16 | | 0.00 | 0.00 | 0.00 | 4.08.E+04 | 0 | 0 |
| Ce 141 | 0.089 | 5.9301E-16 | | 0.00 | 0.00 | 0.00 | 6.24.E-01 | 0 | 0 |
| Te 129 m | 0.0917 | 4.4653E-17 | | 0.00 | 0.00 | 0.00 | 4.98.E-02 | 0 | 0 |
| Yb 169 | 0.0876 | 4.1729E-28 | | 0.00 | 0.00 | 0.00 | 3.72.E-13 | 0 | 0 |

(2020.9 三陸の海・岩手の会作成)

合計Bq

1.80.E+16

1.77.E+12

6.19.E+11

ガラス固化体0.8t分開込めBq

1.44.E+16

1.41.E+12

4.96.E+11