

## 1 Half-life, Q-value and Decay mode

|               |   |          |     |     |
|---------------|---|----------|-----|-----|
| $T_{1/2}$     | : | 14.33    | (4) | y   |
| $Q_{\beta^-}$ | : | 20.8     | (2) | keV |
| $Q_{\alpha}$  | : | 5140.0   | (5) | keV |
| $\beta^-$     | : | 99.99756 | (2) | %   |
| $\alpha$      | : | 0.00244  | (2) | %   |

## 2 $\beta^-$ Transitions

|                 | Energy<br>keV | Probability<br>$\times 100$ | Nature        | $\log ft$ |
|-----------------|---------------|-----------------------------|---------------|-----------|
| $\beta_{0,0}^-$ | 20.8 (2)      | 99.99756 (2)                | 1st forbidden | 5.8       |

## 3 $\alpha$ Emissions

|                 | Energy<br>keV | Probability<br>$\times 100$ |
|-----------------|---------------|-----------------------------|
| $\alpha_{0,10}$ | 4694 (3)      | $\approx 0.0000007$         |
| $\alpha_{0,9}$  | 4733 (3)      | $\approx 0.0000007$         |
| $\alpha_{0,8}$  | 4744 (5)      | $\approx 0.0000017$         |
| $\alpha_{0,7}$  | 4785.1 (11)   | 0.0000005 (2)               |
| $\alpha_{0,6}$  | 4798.0 (5)    | 0.000029 (3)                |
| $\alpha_{0,5}$  | 4853.8 (5)    | 0.000295 (8)                |
| $\alpha_{0,4}$  | 4897.3 (5)    | 0.00203 (4)                 |
| $\alpha_{0,3}$  | 4973.1 (5)    | 0.000032 (3)                |
| $\alpha_{0,2}$  | 4999.2 (5)    | 0.0000100 (12)              |
| $\alpha_{0,1}$  | 5043.4 (5)    | 0.000025 (2)                |
| $\alpha_{0,0}$  | 5054.6 (5)    | 0.0000086 (10)              |

## 4 Electron Emissions

|                 |      | Energy<br>keV   | Electrons<br>per 100 disint. | Energy<br>keV |
|-----------------|------|-----------------|------------------------------|---------------|
| eAL             | (U)  | 5.9 - 21.6      | 0.00117 (6)                  |               |
| eAK             | (U)  |                 | 0.000031 (5)                 |               |
|                 | KLL  | 71.776 - 80.954 | }                            |               |
|                 | KLX  | 88.153 - 98.429 | }                            |               |
|                 | KXY  | 104.51 - 115.59 | }                            |               |
| $\beta_{0,0}^-$ | max: | 20.8 (2)        | 99.99756 (2)                 | avg: 5.8 (1)  |

## 5 Photon Emissions

### 5.1 X-Ray Emissions

|               |     | Energy<br>keV   | Photons<br>per 100 disint. |                |
|---------------|-----|-----------------|----------------------------|----------------|
| XL            | (U) | 11.619 — 20.714 | 0.001166 (40)              |                |
| XK $\alpha_2$ | (U) | 94.666          | 0.000300 (7)               | } K $\alpha$   |
| XK $\alpha_1$ | (U) | 98.44           | 0.000479 (10)              |                |
| XK $\beta_3$  | (U) | 110.421         | } 0.000179 (5)             | } K $\beta'_1$ |
| XK $\beta_1$  | (U) | 111.298         |                            |                |
| XK $\beta'_5$ | (U) | 111.964         |                            |                |
| XK $\beta_2$  | (U) | 114.407         | } 0.000059 (2)             | } K $\beta'_2$ |
| XK $\beta_4$  | (U) | 115.012         |                            |                |
| XK $O_{2,3}$  | (U) | 115.377         |                            |                |

### 5.2 Gamma Transitions and Emissions

|                   | Energy<br>keV | P $_{\gamma+ce}$<br>$\times 100$ | Multipolarity   | $\alpha_T$  | P $_{\gamma}$<br>$\times 100$ |
|-------------------|---------------|----------------------------------|-----------------|-------------|-------------------------------|
| $\gamma_{5,4}(U)$ | 44.18 (3)     | 0.000258 (17)                    | M1+1.7(5)%E2    | 60.4 (29)   | 0.0000042 (2)                 |
| $\gamma_{2,1}(U)$ | 44.86 (10)    | 0.000111 (25)                    | [M1+15(4)%E2]   | 131 (25)    | 0.00000084 (10)               |
| $\gamma_{2,0}(U)$ | 56.30 (12)    | 0.00051 (4)                      | (E2)            | 204 (4)     | 0.0000025 (2)                 |
| $\gamma_{6,5}(U)$ | 56.76 (10)    | 0.0000280 (41)                   | M1+1.1(13)E2    | 27 (3)      | 0.0000010 (1)                 |
| $\gamma_{3,1}(U)$ | 71.64 (9)     | 0.000189 (14)                    | (E2)            | 64.3 (13)   | 0.0000029 (2)                 |
| $\gamma_{4,3}(U)$ | 77.01 (4)     | 0.000225 (6)                     | (M1)            | 9.86 (20)   | 0.0000207 (4)                 |
| $\gamma_{6,4}(U)$ | 100.94 (11)   | 0.00000099                       | (E2)            | 12.8 (3)    | 0.000000072                   |
| $\gamma_{4,2}(U)$ | 103.680 (5)   | 0.000536 (14)                    | [M1+0.47(1)%E2] | 4.20 (9)    | 0.000103 (2)                  |
| $\gamma_{7,4}(U)$ | 114 (1)       | 0.0000067 (13)                   | E1              | 0.0883 (17) | 0.0000062 (12)                |
| $\gamma_{5,3}(U)$ | 121.22 (5)    | 0.0000097 (10)                   | (M1)            | 12.8 (3)    | 0.00000070 (7)                |
| $\gamma_{4,1}(U)$ | 148.567 (10)  | 0.001500 (27)                    | [M1+2.8(1)%E2]  | 7.05 (14)   | 0.0001863 (8)                 |
| $\gamma_{4,0}(U)$ | 159.96 (2)    | 0.0000179 (4)                    | (E2)            | 1.78 (3)    | 0.00000645 (9)                |

## 6 References

- M.S.FREEDMAN, F.WAGNER JR., D.W.ENGELKEMEIR, Phys. Rev. 88 (1952) 1155  
(Beta-transition energy, gamma-ray energies)
- F.ASARO, Thesis, Report UCRL-2180, Univ. California (1953)  
(Alpha-transition energies)
- K.N.SHLIAGIN, Izv. Akad. Nauk SSSR, Ser. Fiz. 20 (1956) 891  
(Beta-transition energy)
- H.L.SMITH, J. Inorg. Nucl. Chem. 17 (1961) 178  
(Beta-transition probability)
- B.S.DZHELEPOV, R.B.IVANOV, V.G.NEDOVESOV, Zh. Eksp. Teor. Fiz. 46 (1964) 1517  
(Alpha-transition energies)
- S.A.BARANOV, M.K.GADZHIEV, V.M.KULAKOV, V.M.MATINSKII, Yad. Fiz. 1 (1965) 557  
(Alpha-transition energies)
- I.A.BARANOV, V.V.BERDIKOV, A.S.KRIVOKHATSKII, A.N.SILANTEV, Izv. Akad. Nauk SSSR, Ser. Fiz. 29 (1965) 163

- (Alpha-transition energies and probabilities, gamma-ray energies)  
 S.A.BARANOV, V.M.KULAKOV, V.M.SHATINSKII, *Yad. Fiz.* 7 (1968) 727  
 (Alpha-transition energies)  
 F.L.OETTING, *Phys. Rev.* 168 (1968) 1398  
 (Average beta-transition energy)  
 I.AHMAD, A.M.FRIEDMAN, J.P.UNIK, *Nucl. Phys.* A119 (1968) 27  
 (Alpha- and gamma transition energies, alpha/beta-branching)  
 R.GUNNINK, R.J.MORROW, Report UCRL-51087, Univ. California (1971)  
 (Gamma-ray energies)  
 J.E.CLIN, R.J.GEHRKE, L.D.MCISAAC, Report ANCR-1069 (1972)  
 (Gamma-ray energies and emission probabilities)  
 S.A.BARANOV, A.G.ZELENKOV, V.M.KULAKOV, Proc. Advisory Group Meeting on Transactinium Nucl. Data, Karlsruhe, Vol.III, IAEA-186, IAEA, Vienna (1976) 249  
 (Alpha-transition energies and probabilities)  
 R.GUNNINK, J.E.EVANS, A.L.PRINDLE, Report UCRL-52139, Univ. California (1976)  
 (Gamma-ray energies and emission probabilities, alpha/beta-branching)  
 H.UMEZAWA, T.SUZUKI, S.ICHIKAWA, *J. Nucl. Sci. Technol.* (Tokyo) 13 (1976) 327  
 (Gamma-ray energies and emission probabilities)  
 R.VANINBROUKX, J.BROOThAERTS, P.DE BIEVRE, B.DENECKE, M.GALLET, NEANDC(E)-192 Vol.III (1977) 55  
 (Alpha/beta-branching)  
 J.K.DICKENS, J.S.EMERY, R.M.FREESTONE, T.A.LOVE, J.W.McCONNELL, K.J.NORTH CUTT, R.W.PEELE, Report ORNL/NUREG/TM-223, Oak Ridge National Laboratory (1978)  
 (Gamma-ray emission probabilities)  
 Y.A.ELLIS, *Nucl. Data Sheets* 23 (1978) 123  
 (Decay scheme)  
 A.CESANA, G.SANDRELLI, V.SANGIUST, M.TERRANI, *Energ. Nucl. (Milan)* 26 (1979) 526  
 (Gamma-ray energies)  
 S.F.MARSH, R.M.ABERNATHEY, R.J.BECKMAN, J.E.REIN, *Int. J. Appl. Radiat. Isotop.* 31 (1980) 629  
 (Half-life)  
 P.DE BIEVRE, M.GALLET, R.WERZ, NEANDC(E)-242 Vol.III (1983) 53  
 (Half-life)  
 K.M.GLOVER, *Int. J. Appl. Radiat. Isotop.* 35 (1984) 239  
 (Alpha-transition energies)  
 S.K.AGGARWAL, A.R.PARAB, S.A.CHITAMBAR, H.C.JAIN, *Phys. Rev.* C31 (1985) 1885  
 (Half-life)  
 A.A.DRUZHININ, V.N.POLYNOV, A.M.KOROCHKIN, E.A.NIKITIN, L.I.LAGUTINA, *At. Energ.* 59 (1985) 68  
 (Half-Lives of the Spontaneous Fission of 241Pu)  
 R.G.HELMEr, C.W.REICH, *Int. J. Appl. Radiat. Isotop.* 36 (1985) 117  
 (Gamma-ray energies and probabilities)  
 H.WILLMES, T.ANDO, R.J.GEHRKE, *Int. J. Appl. Radiat. Isotop.* 36 (1985) 123  
 (Gamma-ray energies and emission probabilities)  
 G.A.TIMOFEEV, V.V.KALYGIN, P.A.PRIVALOVA, *At. Energ.* 60 (1986) 343  
 (Half-life)  
 V.P.CHECHEV, N.K.KUZMENKO, V.O.SERGEEV, K.P.ARTAMONOVA, *Evaluated Decay Data of Transuranium Radionuclides, Handbook*, Publishing House Energoatomizdat, Moscow (1988)  
 (Evaluation of 241Pu decay data)  
 J.L.PARKER, R.N.LIKES, A.GOLDMAN, *Appl. Radiat. Isot.* 40 (1989) 793  
 (Half-life)  
 A.RYTZ, *At. Data Nucl. Data Tables* 47 (1991) 205  
 (Alpha-transition energies)  
 T.DRAGNEV, *Appl. Radiat. Isot.* 44 (1993) 613  
 (Gamma-ray energies)  
 D.T.BARAN, *Appl. Radiat. Isot.* 45 (1994) 1177  
 (Gamma-ray emission probabilities)  
 Y.A.AKOVALI, *Nucl. Data Sheets* 74 (1995) 461  
 (Decay scheme, multipolarities)  
 E.SCHÖNFELD, H.JANSSSEN, *Nucl. Instrum. Methods Phys. Res.* A369 (1996) 527  
 (Atomic data)

- R.B.FIRESTONE, V.S.SHIRLEY, C.M.BAGLIN, S.Y.F.CHU, J.ZIPKIN, Table of Isotopes, 8th Ed., John Wiley and Sons Inc., N.Y. Vol.II (1996)  
 (Decay scheme, gamma-ray energies, multipolarities and level energies)
- P.DE BIEVRE, A.VERBRUGGEN, Proc. Int. Conf. on Nuclear Data for Science and Technology, 19-24 May 1997, Trieste, Italy (1997) 839  
 (Half-life)
- Y.A.AKOVALI, Nucl. Data Sheets 84 (1998) 1  
 (r0 of 237U)
- O.DRAGOUN, A.SPALEK, M.RYSAVY, A.KOVALIK, E.A.YAKUSHEV, V.BRABEC, A.F.NOVGORODOV, N.DRAGOUNOVA, J.RIZEK, J. Phys. (London) G25 (1999) 1839  
 (Beta-transition energy)
- E.SCHÖNFELD, G.RODLOFF, Report PTB-6.11-1999-1, Braunschweig (1999)  
 (KX-ray energies and relative emission probabilities)
- E.A.YAKUSHEV, V.M.GOROZHANKIN, O.DRAGOUN, A.KOVALIK, A.F.NOVGORODOV, M.RYSAVY, A.SHPALEK, Proc. 49th Ann. Conf. Nucl. Spectrosc. Struct. At. Nuclei, Dubna (1999) 118  
 (Beta-transition energy)
- O.DRAGOUN, A.SPALEK, M.RYSAVY, A.KOVALIK, E.YAKUSHEV, V.BRABEC, J.FRANA, D.VENOS, Appl. Radiat. Isot. 52 (2000) 387  
 (Beta-transition energy)
- G.AUDI, A.H.WAPSTRA, C.THIBAUT, Nucl. Phys. A729 (2003) 337  
 (Q)
- N.FOTIADES, G.D.JOHNS, R.O.NELSON, ET AL., Phys. Rev. C69 (2004) 024601  
 (Placement of 121.2 keV gamma transition)
- M.J.MARTIN, Nucl. Data Sheets 106 (2005) 89  
 (Evaluation of beta-transition energy, alpha/beta -branching)
- M.S.BASUNIA, Nucl. Data Sheets 107 (2006) 2323  
 (decay scheme, multipolarities)