Table 1. Nuclear spectroscopic data and yields of fission products in the 6.35 MeV neutron-induced fission of 238U

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YC* (%) | *YA* (%) |
|  84Br85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Ru105Rh112Ag113Ag115Cdg115Cdtotal117Cdm117Cdg117Cdtotal |  31.8 min4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d16.91 h65.94 h39.26 d4.44 h35.36 h3.13 h5.37 h53.46 h3.36 h2.49 h | 1616.2151.2304.9402.6196.3749.81024.31384.9266.9756.7724.3743.4140.5739.5497.1724.4319.1617.5298.6336.21066.01097.3273.4 | 6.275.014.049.625.923.633.090.07.354.044.293.089.412.1390.047.019.243.010.045.923.126.028.0 |  0.642±0.0440.937±0.0420.932±0.0521.680±0.1362.063±0.1653.352±0.2683.419±0.3073.630±0.2533.301±0.2265.324±0.2875.056±0.3076.218±0.3535.041±0.2585.733±0.2395.962±0.2093.370±0.2323.429±0.2140.307±0.0780.221±0.0240.122±0.019 0.143±0.019\*0.033±0.0090.037±0.009 0.099±0.0140.134±0.014 |  0.643±0.0440.937±0.0420.932±0.0521.685±0.1372.090±0.1673.352±0.2683.419±0.3073.634±0.2533.301±0.2265.324±0.2875.056±0.3076.224±0.3535.041±0.2585.733±0.2395.962±0.2093.390±0.2343.429±0.2140.307±0.0780.221±0.024 0.143±0.019\*0.134±0.014 |

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm =6 from Ref. [25]

Table 1. –continued

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-ray Energy(keV) | γ-ray abundance (%) | *YC* (%) | *YA* (%) |
| 127Sb128Sn129Sb131I132Te133I134Te134I135I138Csg139Ba140Ba141Ce142La143Ce144Ce147Nd149Nd151Pm153Sm | 3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h41.8 min52.5 m6.57 h33.41 min83.03 min12.75 d32.5 d91.1 min33.03 h284.89 d10.98 d1.728 h28.4 h46.28 h | 687.0482.3812.4364.5228.1529.9566.0767.2847.03884.091131.51260.41435.81009.8462.8165.8537.3145.4641.3293.3133.5531.0211.3270.2340.8 103.2 | 37.059.043.081.788.087.018.029.595.965.022.728.976.329.830.723.724.448.047.042.811.0913.125.910.623.0 30.0 | 0.594±0.0780.780±0.0561.315±0.1072.840±0.2395.341±0.3206.337±0.309 7.004±0.3516.841±0.357 7.715±0.3237.836±0.333 5.509±0.3055.427±0.2856.615±0.3317.078±0.3467.112±0.3567.107±0.2736.561±0.2145.967±0.2094.559±0.2734.983±0.2975.188±0.3513.663±0.2172.307±0.1552.226±0.1081.166±0.1030.439±0.029 | 0.594±0.0780.818±0.0581.320±0.1072.840±0.2395.368±0.3216.337±0.3097.556±0.3787.380±0.3857.730±0.2237.836±0.3335.548±0.3075.465±0.2876.615±0.3317.078±0.3467.112±0.3567.107±0.2736.561±0.2145.967±0.2094.559±0.2734.983±0.2975.188±0.3513.663±0.2172.316±0.1562.226±0.1081.168±0.1040.439±0.032 |

*YC* – Cumulative yields, *YA* – Mass yields, 135I – Fission rate monitor.

Table 2. Nuclear spectroscopic data and yields of fission products in the 8.53 MeV neutron-induced fission of 238U

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YC* (%) | *YA* (%) |
| 84Br85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Ru105Rh112Ag113Ag115Cdg115Cdtotal117Cdm117Cdg117Cdtotal | 31.8 min4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d16.91 h65.94 h39.26 d4.44 h35.36 h3.13 h5.37 h53.46 h3.36 h2.49 h | 1616.2151.2304.9402.6196.3749.81024.31384.9266.9756.7724.3743.4140.5739.5497.1724.4319.1617.5298.6336.21066.01097.3273.4 | 6.275.014.049.625.923.633.090.07.354.044.293.089.412.1390.047.019.243.010.045.923.126.028.0 | 0.641±0.0380.954±0.0420.963±0.0561.614±0.1532.199±0.1423.763±0.2653.647±0.1723.915±0.3123.766±0.3604.731±0.2835.077±0.2746.170±0.3455.202±0.1255.547±0.1395.278±0.2213.423±0.2343.497±0.2450.389±0.0340.330±0.028 0.214±0.033 0.247±0.033\*0.065±0.0140.056±0.0140.177±0.0230.237±0.028 | 0.642±0.0380.954±0.0420.963±0.0561.619±0.1532.228±0.1443.763±0.2653.647±0.1723.919±0.3123.766±0.3604.731±0.2835.077±0.2746.177±0.3465.202±0.1255.547±0.1395.278±0.2213.444±0.2353.497±0.2450.389±0.0340.330±0.028 0.247±0.033\*0.237±0.028 |

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm =6 from Ref. [25]

Table 2. –continued

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-ray abundance (%) | *YC* (%) | *YA* (%) |
| 127Sb128Sn129Sb131I132Te133I134Te134I135I138Csg139Ba140Ba141Ce142La143Ce144Ce147Nd149Nd151Pm153Sm | 3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h41.8 min52.5 m6.57 h33.41 min83.03 min12.75 d32.5 d91.1 min33.03 h284.89 d10.98 d1.728 h28.4 h46.28 h | 687.0482.3812.4364.5228.1529.9566.0767.2847.03884.091131.51260.41435.81009.8462.8165.8537.3145.4641.3293.3133.5531.0211.3270.2340.8 103.2 | 37.059.043.081.788.087.018.029.595.965.022.720.376.329.830.723.735.420.547.042.811.0913.125.910.623.0 30.0 | 0.777±0.0721.077±0.0871.713±0.1532.949±0.3415.085±0.3546.340±0.2356.844±0.3437.093±0.3527.444±0.3127.459±0.2545.327±0.1765.294±0.2435.658±0.2835.879±0.2936.071±0.3036.426±0.2936.042±0.2165.317±0.2354.385±0.1734.635±0.2025.086±0.2113.751±0.1832.229±0.2012.291±0.1201.166±0.0980.394±0.031 | 0.778±0.0721.129±0.0911.719±0.1542.949±0.3415.111±0.3556.340±0.2357.375±0.3707.644±0.3797.459±0.3127.473±0.2555.365±0.1785.331±0.2455.658±0.2835.879±0.2936.071±0.3036.426±0.2936.042±0.2165.317±0.2354.385±0.1734.635±0.2025.086±0.2113.751±0.1832.238±0.2022.301±0.1201.168±0.0980.434±0.034 |

*YC* – Cumulative yields, *YA* – Mass yields, 135I – Fission rate monitor.

Table 3. Nuclear spectroscopic data and yields of fission products in the 9.35 MeV neutron-induced fission of 238U

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YC* (%) | *YA* (%) |
| 84Br85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Ru105Rh112Ag113Ag115Cdg115Cdtotal117Cdm117Cdg117Cdtotal | 31.8 min4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d16.91 h65.94 h39.26 d4.44 h35.36 h3.13 h5.37 h53.46 h3.36 h2.49 h | 1616.2151.2304.9402.6196.3749.81024.31384.9266.9756.7724.3743.4140.5739.5497.1724.4319.1617.5298.6336.21066.01097.3273.4 | 6.275.014.049.625.923.633.090.07.354.044.293.089.412.1390.047.019.243.010.045.923.126.028.0 |  0.664±0.0421.067±0.0621.076±0.0851.962±0.1202.361±0.1503.898±0.2823.699±0.2494.318±0.2543.898±0.2724.733±0.1945.380±0.2406.191±0.2035.226±0.1525.449±0.2455.763±0.2543.401±0.2903.496±0.2450.439±0.0510.328±0.0320.237±0.0270.277±0.027\*0.065±0.0090.074±0.0140.196±0.0310.267±0.036 |  0.665±0.0421.067±0.0621.076±0.0851.968±0.1212.392±0.1523.898±0.2823.699±0.2494.322±0.2543.898±0.2724.733±0.1945.380±0.2406.197±0.2035.226±0.1525.449±0.2455.763±0.2543.408±0.2913.496±0.2450.439±0.0510.328±0.0320.277±0.027\*0.267±0.036 |

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm =6 from Ref. [25]

Table 3. –continued

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-ray abundance (%) | *YC* (%) | *YA* (%) |
| 127Sb128Sn129Sb131I132Te133I134Te134I135I138Csg139Ba140Ba141Ce142La143Ce144Ce147Nd149Nd151Pm153Sm | 3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h41.8 min52.5 m6.57 h33.41 min83.03 min12.75 d32.5 d91.1 min33.03 h284.89 d10.98 d1.728 h28.4 h46.28 h | 687.0482.3812.4364.5228.1529.9566.0767.2847.03884.091131.51260.41435.81009.8462.8165.8537.3145.4641.3293.3133.5531.0211.3270.2340.8 103.2 | 37.059.043.081.788.087.018.029.595.965.022.728.976.329.830.723.724.448.047.042.811.0913.125.910.623.0 30.0 | 0.780±0.0651.123±0.0791.421±0.0833.177±0.2224.765±0.2856.174±0.2406.401±0.1926.727±0.2327.107±0.2496.876±0.2075.397±0.2525.150±0.2065.833±0.2915.620±0.2825.990±0.3015.990±0.2225.768±0.1995.348±0.2084.909±0.1575.283±0.2035.426±0.2173.376±0.2362.240±0.1292.343±0.1021.201±0.1290.418±0.038 | 0.780±0.0651.178±0.0831.427±0.0833.177±0.2224.789±0.2866.174±0.2406.890±0.2127.241±0.2497.121±0.2496.890±0.2085.435±0.2545.186±0.2085.833±0.2915.620±0.2825.990±0.3015.990±0.2225.768±0.1995.348±0.2084.909±0.1575.283±0.2035.426±0.2173.376±0.2362.249±0.1292.352±0.1031.206±0.1290.460±0.041 |

*YR* – Cumulative yields, *YA* – Mass yields, 135I – Fission rate monitor.

Table 4. Nuclear spectroscopic data and yields of fission products in the 12.52 MeV neutron-induced fission of 238U

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-ray Energy(keV) | γ-ray abundance (%) | *YC* (%) | *YA* (%) |
| 84Br85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Ru105Rh112Ag113Ag115Cdg115Cdtotal117Cdm117Cdg117Cdtotal | 31.8 min4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d16.91 h65.94 h39.26 d4.44 h35.36 h3.13 h5.37 h53.46 h3.36 h2.49 h | 1616.2151.2304.9402.6196.3749.81024.31384.9266.9756.7724.3743.4140.5739.5497.1724.4319.1617.5298.6336.21066.01097.3273.4 | 6.275.014.049.625.923.633.090.07.354.044.293.089.412.1390.047.019.243.010.045.923.126.028.0 | 0.695±0.0411.171±0.0951.192±0.0952.191±0.1082.788±0.1453.451±0.2113.836±0.1534.312±0.2113.702±0.1625.057±0.2205.290±0.1975.899±0.2204.644±0.1885106±0.2605.842±0.1843.309±0.2063.486±0.2420.615±0.0490.524±0.0400.431±0.0390.503±0.039\*0.126±0.0130.117±0.0180.354±0.0310.476±0.036 | 0.696±0.0411.171±0.0951.192±0.0952.195±0.1082.822±0.1473.451±0.2113.836±0.1534.316±0.2113.701±0.1625.057±0.2205.290±0.1975.905±0.2204.644±0.1885.106±0.2605.842±0.1843.316±0.2063.486±0.2420.615±0.0490.525±0.040 0.503±0.039\*0.476±0.036 |

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm =6 from Ref. [25]

Table 4. –continued

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-ray abundance (%) | *YC* (%) | *YA* (%) |
| 127Sb128Sn129Sb131I132Te133I134Te134I135I138Csg139Ba140Ba141Ce142La143Ce144Ce147Nd149Nd151Pm153Sm | 3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h41.8 min52.5 m6.57 h33.41 min83.03 min12.75 d32.5 d91.1 min33.03 h284.89 d10.98 d1.728 h28.4 h46.28 h | 687.0482.3812.4364.5228.1529.9566.0767.2847.03884.091131.51260.41435.81009.8462.8165.8537.3145.4641.3293.3133.5531.0211.3270.2340.8 103.2 | 37.059.043.081.788.087.018.029.595.965.022.728.976.329.830.723.724.448.047.042.811.0913.125.910.623.0 30.0 | 0.843±0.0671.251±0.0991.667±0.1973.639±0.2654.853±0.2545.748±0.1936.005±0.2716.247±0.2256.950±0.2196.704±0.2155.062±0.2094.946±0.2035.465±0.2386.246±0.1976.084±0.1885.788±0.2385.568±0.1975.120±0.2204.631±0.1884.918±0.2065.079±0.242 3.101±0.1572.114±0.1702.117±0.207 1.185±0.052 0.382±0.028 | 0.844±0.0671.310±0.0991.674±0.1973.639±0.2654.877±0.2565.748±0.1936.457±0.2886.717±0.2426.964±0.2206.717±0.2155.097±0.2114.981±0.2065.465±0.2386.246±0.1976.084±0.1885.788±0.2385.568±0.1975.120±0.2204.631±0.1884.918±0.2065.079±0.2423.101±0.1572.118±0.1712.126±0.207 1.188±0.0520.422±0.031 |

*YC* – Cumulative yields, *YA* – Mass yields, 135I – Fission rate monitor.