Table 1. Nuclear spectroscopic data and yields of fission products in the 5.42 MeV neutron-induced fission of 232Th.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy (keV) | γ-rayabundance (%) | *YR*(%) | *YA* (%) |
| 85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Rh112Ag115Cdg115Cdtotal127Sb128Sn129Sb131I132Te133I134I135I139Ba140Ba141Ce142La143Ce147Nd150Pm | 4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d 16.91 h65.94 h39.26 d35.36 h3.13 h53.46 h3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h52.5 min6.57 h83.03 min12.75 d32.5 d91.1 min33.03 h10.98 d 2.68 h  | 151.2304.9402.6196.3749.81024.31384.9266.9724.3743.4140.5739.5497.1319.1617.5527.9687.0482.3812.4364.5228.1529.9847.3884.091131.51260.4165.8537.3145.4641.3293.3531.0 333.97 | 75.014.049.625.923.633.090.07.344.293.089.412.1390.019.243.027.4537.059.043.081.788.087.095.965.022.720.323.735.420.547.042.813.1 68.0 | 3.832±0.3463.918±0.1015.859±0.5725.778±0.4155.782±0.4276.223±0.6835.453±0.0525.369±0.5556.664±0.6784.639±0.4222.874±0.2283.107±0.2470.479±0.1280.128±0.0140.204±0.033 0.180±0.033 0.209±0.038\*0.498±0.0810.993±0.1071.631±0.1463.007±0.2423.604±0.2874.796±0.6066.835±0.6156.750±0.5215.746±0.3525.817±0.4647.565±0.4558.177±0.5747.314±0.4936.137±0.3946.432±0.3612.275±0.1610.522±0.047 | 3.832±0.3463.846±0.1015.877±0.5745.872±0.4225.782±0.4276.223±0.6835.464±0.0525.369±0.5556.664±0.6784.643±0.4222.874±0.2283.107±0.2470.479±0.1280.128±0.0140.204±0.033  0.209±0.038\*0.498±0.0811.058±0.1141.641±0.1473.007±0.2423.633±0.2894.811±0.6076.849±0.6176.764±0.5225.810±0.3565.881±0.4707.565±0.4558.177±0.5747.314±0.4936.137±0.3946.432±0.3612.281±0.1610.522±0.047 |

*YR* – Cumulative yields, *YA* – Mass yields, 92Sr – Fission rate monitor.

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm = 6 as done in Ref. [50].

Table 2. Nuclear spectroscopic data and yields of fission products in the 7.75 MeV neutron-induced fission of 232Th.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YR*(%) | *YA* (%) |
| 85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Rh112Ag115Cdg115Cdtotal127Sb128Sn129Sb131I132Te133I134I135I139Ba140Ba141Ce142La143Ce147Nd150Pm | 4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d 16.91 h65.94 h39.26 d35.36 h3.13 h53.46 h3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h52.5 min6.57 h83.03 min12.75 d32.5 d91.1 min33.03 h10.98 d 2.68 h  | 151.2304.9402.6196.3749.81024.31384.9266.9724.3743.4140.5739.5497.1319.1617.5527.9687.0482.3812.4364.5228.1529.9847.3884.091131.51260.4165.8537.3145.4641.3293.3531.0 333.97 | 75.014.049.625.923.633.090.07.344.293.089.412.1390.019.243.027.4537.059.043.081.788.087.095.965.022.720.323.735.420.547.042.813.1 68.0 | 3.331±0.1373.827±0.2175.677±0.1705.551±0.1125.783±0.4066.005±0.5675.201±0.0525.127±0.3836.454±0.4544.701±0.4303.033±0.2413.123±0.2500.533±0.1510.241±0.0280.274±0.024 0.260±0.024 0.302±0.028\*0.533±0.0521.328±0.1461.706±0.2323.052±0.2083.846±0.4354.904±0.3456.687±0.4576.927±0.4875.262±0.4165.609±0.7067.031±0.5628.240±0.5246.984±0.7436.119±0.3176.766±0.5812.351±0.2740.581±0.019 | 3.331±0.1373.827±0.2175.694±0.1705.642±0.1135.783±0.4066.005±0.5675.212±0.0525.127±0.3836.454±0.4544.701±0.4303.033±0.2413.123±0.2500.533±0.1510.241±0.0280.274±0.024  0.302±0.028\*0.533±0.0521.412±0.1561.716±0.2333.052±0.2083.877±0.4384.909±0.3456.700±0.4586.947±0.4885.316±0.4215.665±0.7137.031±0.5628.240±0.5246.984±0.7436.119±0.3176.766±0.5812.358±0.2750.582±0.019 |

*YR* – Cumulative yields, *YA* – Mass yields, 92Sr – Fission rate monitor.

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm = 6 as done in Ref. [50].

Table 3. Nuclear spectroscopic data and yields of fission products in the 9.35 MeV neutron-induced fission of 232Th.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YR*(%) | *YA* (%) |
| 85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Rh112Ag115Cdg115Cdtotal127Sb128Sn129Sb131I132Te133I134I135I139Ba140Ba141Ce142La143Ce147Nd150Pm | 4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d 16.91 h65.94 h39.26 d35.36 h3.13 h53.46 h3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h52.5 min6.57 h83.03 min12.75 d32.5 d91.1 min33.03 h10.98 d 2.68 h  | 151.2304.9402.6196.3749.81024.31384.9266.9724.3743.4140.5739.5497.1319.1617.5527.9687.0482.3812.4364.5228.1529.9847.3884.091131.51260.4165.8537.3145.4641.3293.3531.0 333.97 | 75.014.049.625.923.633.090.07.344.293.089.412.1390.019.243.027.4537.059.043.081.788.087.095.965.022.720.323.735.420.547.042.813.1 68.0 | 3.124±0.1823.181±0.2516.139±0.4895.427±0.4315.906±0.3866.023±0.4825.418±0.3774.925±0.3436.392±0.4474.838±0.3512.890±0.2302.790±0.3250.668±0.0820.378±0.0610.538±0.048 0.454±0.122 0.529±0.139\*0.634±0.0561.002±0.2521.666±0.2563.207±0.2564.305±0.3435.351±0.3526.305±0.5036.692±0.6475.650±0.9635.741±0.7556.830±0.2697.473±0.5256.123±0.3695.559±0.4696.028±0.2861.996±0.1080.438±0.017 | 3.124±0.1823.181±0.2516.158±0.4905.516±0.4385.906±0.3866.023±0.4825.429±0.3784.925±0.3436.392±0.4474.843±0.3522.890±0.2302.790±0.3250.668±0.0820.378±0.0610.539±0.048  0.529±0.139\*0.634±0.0561.066±0.2681.676±0.2583.207±0.2563.340±0.3465.356±0.3526.318±0.5046.705±0.6485.707±0.9735.799±0.7636.830±0.2697.473±0.5256.123±0.3695.559±0.4696.028±0.2862.002±0.1090.439±0.017 |

*YR* – Cumulative yields, *YA* – Mass yields, 92Sr – Fission rate monitor.

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm = 6 as done in Ref. [50].

Table 4. Nuclear spectroscopic data and yields of fission products in the 12.53 MeV neutron-induced fission of 232Th.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Nuclide | Half-life | γ-rayEnergy(keV) | γ-rayabundance (%) | *YR*(%) | *YA* (%) |
| 85Krm87Kr88Kr91Sr92Sr93Y95Zr97Zr99Mo103Ru105Rh112Ag115Cdg115Cdtotal127Sb128Sn129Sb131I132Te133I134I135I139Ba140Ba141Ce142La143Ce147Nd150Pm | 4.48 h76.3 min2.84 h9.63 h2.71 h10.18 h64.02 d 16.91 h65.94 h39.26 d35.36 h3.13 h53.46 h3.85 d59.07 min4.32 h8.02 d3.2 d20.8 h52.5 min6.57 h83.03 min12.75 d32.5 d91.1 min33.03 h10.98 d 2.68 h  | 151.2304.9402.6196.3749.81024.31384.9266.9724.3743.4140.5739.5497.1319.1617.5527.9687.0482.3812.4364.5228.1529.9847.3884.091131.51260.4165.8537.3145.4641.3293.3531.0 333.97 | 75.014.049.625.923.633.090.07.344.293.089.412.1390.019.243.027.4537.059.043.081.788.087.095.965.022.720.323.735.420.547.042.813.1 68.0 | 3.119±0.2503.210±0.2585.459±0.1715.109±0.5045.513±0.3875.671±0.9545.063±0.3284.651±0.6505.934±0.5834.672±0.3292.902±0.2332.819±0.2580.858±0.0510.629±0.0540.791±0.058 0.754±0.096 0.879±0.112\*0.791±0.0621.166±0.0921.707±0.1922.986±0.2584.160±0.2875.422±0.5506.608±0.4266.167±0.5205.676±0.4665.438±0.4017.070±0.4967.237±0.5456.279±0.6585.796±0.4045.875±0.6372.074±0.1330.458±0.042 | 3.119±0.2503.210±0.2585.475±0.1715.192±0.5125.513±0.3875.671±0.9545.074±0.3294.651±0.6505.934±0.5834.677±0.3292.902±0.2332.819±0.2580.858±0.0510.629±0.0540.792±0.058  0.879±0.112\*0.791±0.0621.239±0.0971.716±0.1932.986±0.2583.189±0.2895.427±0.5506.622±0.4636.179±0.5225.733±0.4715.493±0.4057.070±0.4967.237±0.5456.279±0.6585.796±0.4045.875±0.6372.080±0.1340.459±0.042 |

*YR* – Cumulative yields, *YA* – Mass yields, 92Sr – Fission rate monitor.

\*The yields of 115Cdtotal is based on the ratio of 115Cdg/115Cdm = 6 as done in Ref. [50].