

$^{238}\text{U}(\text{n},\gamma)$ E=res [2008ObZZ](#),[1998Ob01](#),[1995Ob01](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS	122, 293 (2014)	30-Jun-2013

Additional information 1.

[1998Ob01](#),[1995Ob01](#) – s-wave neutron resonance energies: 708.3-, 721.6-, 730.1-, 765.1 eV.

Target: 99.999% depleted ^{238}U . Measured neutrons with a time-of-flight spectrometer. Measured $E\gamma$, $I\gamma$ for individual resonances using a coaxial high-purity Ge detector. γ rays populate and de-excite levels in the second potential well of the shape-isomeric ground state. This shape isomer may eventually undergo spontaneous fission or decay by γ rays to levels in the first potential well.

[2008ObZZ](#) – Target: depleted ^{238}U . Measured neutrons and γ -ray energies and intensities depopulating the superdeformed ground state in the first potential well.

Others: [1994Ob01](#), [1991Ad08](#).

For $^{238}\text{U}(\text{n},\gamma)$ Fission see: [2001VI04](#), [1998Mi22](#), [1996Eg02](#), [1994Mu20](#), [1993ObZZ](#), [1993Ku03](#), [1992LaZP](#).

 ^{239}U Levels

E(level) ^{†‡}	J π	T _{1/2}	Comments
0.0	5/2 ⁺		
98.6	9/2 ⁺		
990.5	3/2 ⁺ , 5/2 ⁺		
0.0+x [#]	(5/2 ⁺)	>0.25 μs	T _{1/2} : from delayed $\gamma\gamma$ coin (1994Ob01).
174.0+x			
477.8+x	(3/2 ⁻)		
1083.4+x	(1/2 ⁺ , 5/2 ⁺)		
1626.9+x	(1/2 ⁻ , 3/2 ⁻)		
1630.6+x	(3/2 ⁻)		
1767.5+x	(1/2 ⁻ , 3/2 ⁻)		
1776.5+x?			
1808.2+x?			
3107.0+x	(1/2 ⁺)		

[†] From [1998Ob01](#).

[‡] x=1699 keV, from (n, γ) E=res experiment ([2008ObZZ](#)). x $\approx$ 1700 keV, proposed by [1998Ob01](#) on the basis of neutron resonance spacings.

[#] From [2008ObZZ](#).

$\gamma(^{239}\text{U})$									
E_γ [†]	E(n)(eV)=708.3 [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E(n)(eV)=721.6 [†]	E(n)(eV)=730.1 [†]	E(n)(eV)=765.1 [†]	Comments
98.6		98.6	9/2 ⁺	0.0	5/2 ⁺				
^x 472.8 11	0.37 3					0.19 2	0.27 3	0.18 2	
477.8 4	0.20 2	477.8+x	(3/2 ⁻)	0.0+x	(5/2 ⁺)	0.42 2	0.20 2	0.17 1	Multipolarity: (E1).
549.8 11	0.07 2	1630.6+x	(3/2 ⁻)	1083.4+x	(1/2 ⁺ ,5/2 ⁺)	0.58 7	0.31 4	0.04 1	
^x 597.9 5	0.37 3					0.19 2	0.26 2	0.18 2	
605.6 5	0.19 6	1083.4+x	(1/2 ⁺ ,5/2 ⁺)	477.8+x	(3/2 ⁻)	0.41 2	0.31 12	0.10 4	Multipolarity: (E1).
^x 632.5 5	0.03 1					0.51 4	0.22 3	0.24 3	
708.0 [‡]		0.0+x	(5/2 ⁺)	990.5	3/2 ⁺ ,5/2 ⁺				
990.5		990.5	3/2 ⁺ ,5/2 ⁺	0.0	5/2 ⁺				
1298.8 [#] @ 10	0.08 [#] 2	1776.5+x?		477.8+x	(3/2 ⁻)	0.41 6	0.28 4	0.23 4	
1298.8 [#] @ 10	0.08 [#] 2	3107.0+x	(1/2 ⁺)	1808.2+x?		0.41 6	0.28 4	0.23 4	
1339.5 @ 10	0.07 1	3107.0+x	(1/2 ⁺)	1767.5+x	(1/2 ⁻ ,3/2 ⁻)	0.67 6	0.24 3	0.02 1	Multipolarity: (E1).
^x 1343.8 10	0.25 4					0.46 5	0.28 4		
1476.4 11	0.08 1	3107.0+x	(1/2 ⁺)	1630.6+x	(3/2 ⁻)	0.56 4	0.26 2	0.10 1	Multipolarity: (E1).
1480.1 @ 11	0.15 2	3107.0+x	(1/2 ⁺)	1626.9+x	(1/2 ⁻ ,3/2 ⁻)	0.67 6	0.17 2	0.01 1	Multipolarity: (E1).
1600.3 [‡]		0.0+x	(5/2 ⁺)	98.6	9/2 ⁺				
2933.0 21	0.46 9	3107.0+x	(1/2 ⁺)	174.0+x		0.30 7	0.24 6		
3107.0 23		3107.0+x	(1/2 ⁺)	0.0+x	(5/2 ⁺)	0.52 12	0.47 11	0.01 1	Multipolarity: (E2).

[†] I_γ from [1998Ob01](#), [1995Ob01](#).

[‡] From [2008ObZZ](#).

[#] Multiply placed with undivided intensity.

@ Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

→	$I_\gamma < 2\% \times I_\gamma^{\max}$
→	$I_\gamma < 10\% \times I_\gamma^{\max}$
→	$I_\gamma > 10\% \times I_\gamma^{\max}$
- - - - -	γ Decay (Uncertain)

