Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, [1] and Jun Chen[2]	NDS 169, 1 (2020)	15-Oct-2020

Q(β^-)=1200 *40*; S(n)=6840 *60*; S(p)=9840 *SY*; Q(α)=−380 *60* 2017Wa10

Q(β^-): deduced by evaluator from mass excess=−35583 *5* for ^{190}Re measured by 2020Gr08 and known mass excess of ^{190}W in 2017Wa10. Other: 1250 *60* from 2017Wa10.

Estimated uncertainty=200 for S(p) (2017Wa10).

S(2n)=11860 *40*, S(2p)=18080 *300* (syst) (2017Wa10).

Other measurements:

1976Ha39: ^{190}W produced and identified in ^{192}Os(n,p2n),E=25-200 MeV and ^{192}Os(p,3p),E=92 MeV reactions.

Mass measurement: 2013Sh30, Schottky mass spectrometry (SMS) technique using FRS-ESR facility at GSI.

Theory references: consult the NSR database (www.nndc.bnl.gov/nsr/) for about 25 primary references dealing with nuclear structure calculations.

Additional information 1.

^{190}W Levels

An isomer at unknown energy with $T_{1/2}$=0.35 μs *4* was proposed by 2011St21 from their gamma-ray data, with half-life from decay curve of delayed W x-rays in ^{9}Be(^{209}Pb,X),E=1 GeV/nucleon reaction, and assigned as possible 0^+ to 0^+ shape-changing transition. Evaluators treat the existence of this isomer as uncertain, as no confirmation is provided in other studies.

Cross Reference (XREF) Flags

- A ^{190}Ta β^- decay (5.3 s)
- B ^{190}W IT decay (111 ns)
- C ^{190}W IT decay (166 μs)
- D ^{192}Os(^{136}Xe,Xγ),^{186}W(^{136}Xe,Xγ)

E(level)‡	J$^\pi$#	$T_{1/2}$†	XREF	Comments
0.0@	0^+	30.0 min *15*	ABCD	%β^-=100 $T_{1/2}$: from β-decay curve (1976Ha39).
206.8@ *5*	(2^+)		ABCD	
453.9 *8*	(2^+)		A	
565.1@ *7*	(4^+)		ABCD	
1049.4@ *9*	(6^+)		BCD	
1642.2@ *12*	(8^+)		BCD	
1743.6& *10*	(8^+)	111 ns *17*	BCD	%IT=100 $T_{1/2}$: from γ(t) with gates on the prompt 324γ and 356γ feeding this level (2010La16). Configuration=ν9/2[505]⊗ν7/2[503], $K^\pi=8^+$ (2010La16,2009Fa06).
1840.6 *14*	(10^-)	166 μs *6*	CD	%IT=100 $T_{1/2}$: from γ(t) (2010La16). Others: 108 μs *9* (2011St21, from γ(t); earlier values: 106 μs *18* in 2009Al30, 105 μs *22* in 2009Fa06, 0.06 ms *+150−3* in 2005Ca02 and ≤3.1 ms or 0.39 ms +∞−*26* in 2000Po26) seems in disagreement. Configuration=ν9/2[505]⊗ν11/2[615], $K^\pi=10^-$ (2010La16,2005Ca02,2000Po26).
2067.6& *14*	(9^+)		D	
2318.2@ *16*	(10^+)		D	
2423.6& *18*	(10^+)		D	
2655.2 *19*	(12^+)		D	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{190}W Levels (continued)

† isomer and half-life proposed by 2011St21.
‡ From least-squares fit to γ-ray energies, assuming 1 keV uncertainty for Eγ when not stated.
# From systematics of even-even nuclei up to 1641, (8$^+$), and band assignment for higher positive-parity levels. For (10$^-$) level, the assignment is from (M2) transition to 1742, (8$^+$) level.
@ Band(A): g.s. band.
& Band(B): K^π=8$^+$, ν9/2[505]⊗ν7/2[503].

γ(^{190}W)

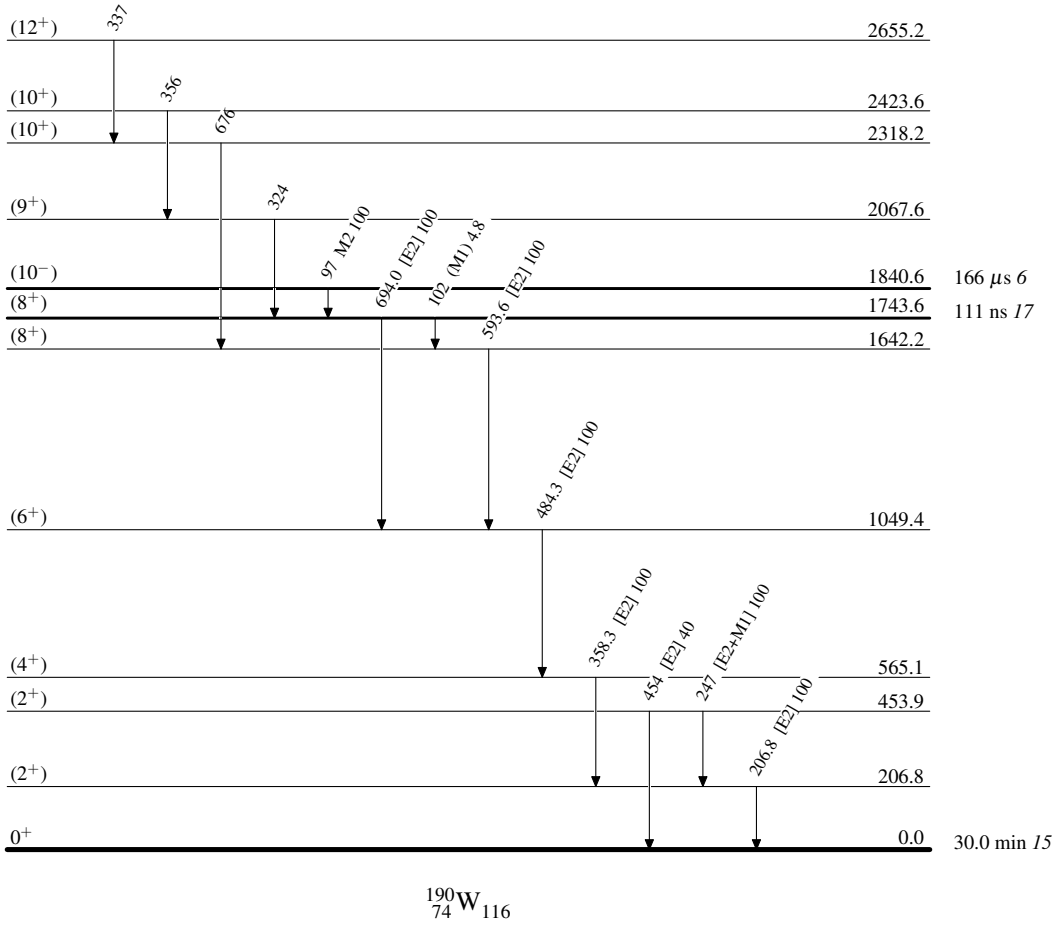
E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.	α&	Comments
206.8	(2$^+$)	206.8 *5*	100	0.0	0$^+$	[E2]	0.275	
453.9	(2$^+$)	247@	100@ *25*	206.8	(2$^+$)	[E2+M1]	0.26 *11*	
		454@	40@ *20*	0.0	0$^+$	[E2]	0.0268	
565.1	(4$^+$)	358.3 *5*	100	206.8	(2$^+$)	[E2]	0.0510	
1049.4	(6$^+$)	484.3 *5*	100	565.1	(4$^+$)	[E2]	0.0227	
1642.2	(8$^+$)	593.6 *11*	100	1049.4	(6$^+$)	[E2]	0.01387	
1743.6	(8$^+$)	102	4.8‡ *11*	1642.2	(8$^+$)	(M1)	4.49	B(M1)(W.u.)=7.0×10^{-6} *+32−23* Mult.: M1 or E2 from α(exp) deduced from γ-ray intensity balance in ^{190}W IT decay (111 ns) (2010La16). Reduced hindrance factor f_ν=5.5 *3*, ν=7, from B(M1)(W.u.).
		694.0 *5*	100‡ *2*	1049.4	(6$^+$)	[E2]	0.00972	B(E2)(W.u.)=3.8×10^{-4} *+10−7* Reduced hindrance factor f_ν=3.7 *1*, ν=7, from B(M1)(W.u.).
1840.6	(10$^-$)	97‡	100	1743.6	(8$^+$)	M2	48.1	B(M2)(W.u.)=0.0134 *9* Mult.: from α(exp) deduced from intensity balance arguments in ^{190}W IT decay (166 μs) (2010La16).
2067.6	(9$^+$)	324#		1743.6	(8$^+$)			
2318.2	(10$^+$)	676#		1642.2	(8$^+$)			
2423.6	(10$^+$)	356#		2067.6	(9$^+$)			
2655.2	(12$^+$)	337#		2318.2	(10$^+$)			

† From ^{190}W IT decay (111 ns), unless otherwise stated.
‡ From IT decay (166 μs).
# From ^{192}Os(^{136}Xe,Xγ),^{186}W(^{136}Xe,Xγ).
@ From ^{190}Ta β$^-$ decay (5.3 s).
& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas

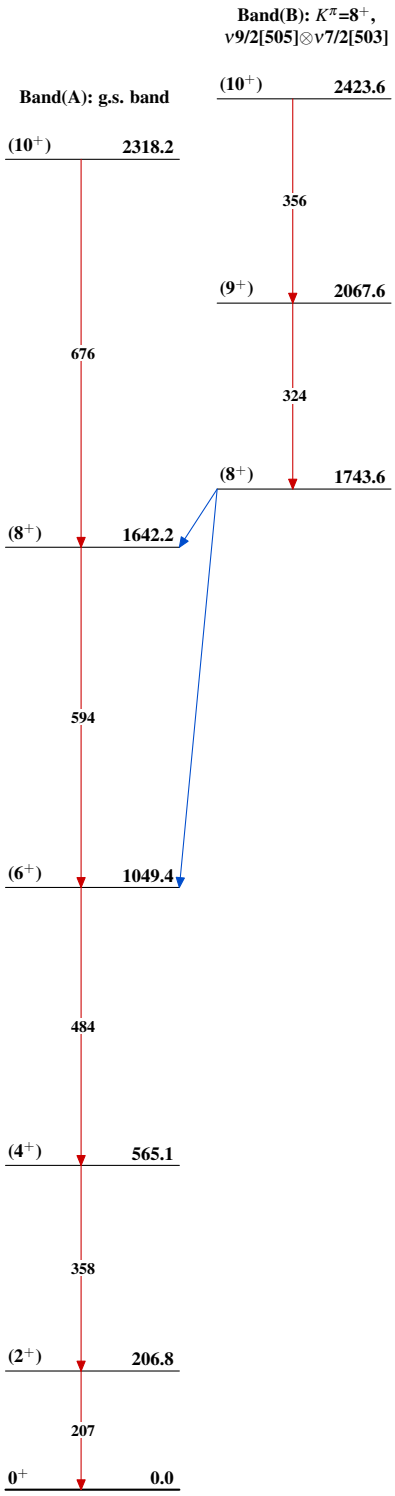
Level Scheme

Intensities: Relative photon branching from each level



$^{190}_{74}W_{116}$

Adopted Levels, Gammas



$^{190}_{74}W_{116}$