^{186}W(^{18}O,^{17}Oγ) 2008Sh12

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110, 999 (2009)	1-Nov-2008

2008Sh12: One neutron transfer reaction. Target: 99.2% enriched ^{186}W; Projectile: ^{18}O, E=180 MeV; Detector: two ΔE-E telescopes for charged particle identification, an array of seven HPGe detectors; Measured: Eγ, Iγ, $\gamma\gamma$ coin, γ-particle coin, γ-ray anisotropy, deduced level scheme.

^{187}W Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$	Comments
0.0[@]	3/2$^-$		
77.26[@] *8*	5/2$^-$		
145.70[#] *9*	1/2$^-$		
201.28[@] *8*	7/2$^-$		Experimental absolute(g_K-g_R)=0.25 *3*.
204.86[#] *13*	3/2$^-$		
302.98[#] *8*	5/2$^-$		
330.40[@] *10*	9/2$^-$		Experimental absolute (g_K-g_R)=0.21 *4*.
350.02[&] *10*	7/2$^-$	5 ns *1*	T$_{1/2}$: from Adopted Levels.
364.0[a] *5*	9/2$^-$		
410.0[b] *7*	11/2$^+$	1.55 μs *13*	T$_{1/2}$: from 2005Sh26 (by the same group as 2008Sh12).
431.85[#] *11*	7/2$^-$		
521.38[&] *14*	9/2$^-$		
538.28[@] *13*	11/2$^-$		
573.9[a] *5*	11/2$^-$		
597.2[b] *7*	13/2$^+$		
613.02[#] *12*	9/2$^-$		
639.52 *14*	5/2$^-$		Band assignment=5/2[503].
710.40[@] *14*	13/2$^-$		
727.16[&] *15*	11/2$^-$		Experimental absolute(g_K-g_R)=0.50 *10*.
796.62[#] *12*	11/2$^-$		
798.2[c] *7*	(9/2$^+$)		
809.6[a] *5*	13/2$^-$		Experimental absolute(g_K-g_R)=0.12 *4*.
815.5[b] *7*	15/2$^+$		Experimental absolute(g_K-g_R)=0.42 *5*.
964.22[&] *20*	(13/2$^-$)		Experimental absolute(g_K-g_R)=0.68 *9*.
978.5[c] *7*	(11/2$^+$)		
1006.28[@] *16*	15/2$^-$		
1055.2[b] *7*	17/2$^+$		Experimental absolute(g_K-g_R)=0.51 *8*.
1063.02[#] *24*	13/2$^-$		
1072.4[a] *5*	(15/2$^-$)		
1205.5[c] *7*	(13/2$^+$)		Experimental absolute(g_K-g_R)=0.68 *11*.
1213.20[@] *25*	(17/2$^-$)		
1228.66[&] *25*	(15/2$^-$)		
1233.18[#] *24*	(15/2$^-$)		
1311.8[b] *8*	(19/2$^+$)		
1359.9[a] *5*	(17/2$^-$)		
1450.6[c] *8*	(15/2$^+$)		
1596.78[@] *19*	(19/2$^-$)		
1650.0[#] *11*	(17/2$^-$)		

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$^{186}W(^{18}O,^{17}O\gamma)$ 2008Sh12 (continued)

^{187}W Levels (continued)

E(level)[†]	Jπ[‡]
1784.0[#] *3*	(19/2⁻)
1832.2[@] *11*	(21/2⁻)

[†] From a least-squares adjustment to the γ-ray energies.
[‡] Assigned by authors from rotational band structure, γ-ray multipole order (determined from γ-ray anisotropy measurement – not reported) and earlier studies.
[#] ν1/2⁻[510].
[@] ν3/2⁻[512].
[&] ν7/2⁻[503].
[a] ν9/2⁻[505].
[b] ν11/2⁺[615].
[c] ν9/2⁺[624].

γ(^{187}W)

Eγ	Iγ	Ei(level)	Jπi	Ef	Jπf	Mult.[†]	Comments
(14)		364.0	9/2⁻	350.02	7/2⁻		
46.0 *5*	3.9 *5*	410.0	11/2⁺	364.0	9/2⁻		
59[‡]		204.86	3/2⁻	145.70	1/2⁻		
77.2 *1*	13.7 *14*	77.26	5/2⁻	0.0	3/2⁻		
98[‡]		302.98	5/2⁻	204.86	3/2⁻		
101.8 *1*	5.3 *4*	302.98	5/2⁻	201.28	7/2⁻		
124.1 *1*	27.5 *20*	201.28	7/2⁻	77.26	5/2⁻		
127.6 *1*	2.7 *11*	204.86	3/2⁻	77.26	5/2⁻		
128.9 *1*	5.6 *5*	431.85	7/2⁻	302.98	5/2⁻		
129.1 *2*	2.1 *4*	330.40	9/2⁻	201.28	7/2⁻		
145.7 *1*	13.7 *14*	145.70	1/2⁻	0.0	3/2⁻	D+Q	γ-ray anisotropy 0.7 *2*.
148.8 *1*	12.6 *6*	350.02	7/2⁻	201.28	7/2⁻	D+Q	γ-ray anisotropy 1.1 *1*.
157.3 *2*	1.9 *3*	302.98	5/2⁻	145.70	1/2⁻		
171.4 *1*	12.1 *6*	521.38	9/2⁻	350.02	7/2⁻	D+Q	γ-ray anisotropy 0.4 *1*.
180.1 *1*	4.6 *3*	978.5	(11/2⁺)	798.2	(9/2⁺)	D+Q	γ-ray anisotropy 0.4 *1*.
187.2 *1*	89 *8*	597.2	13/2⁺	410.0	11/2⁺	D+Q	γ-ray anisotropy 0.3 *1*.
200.7 *2*	2.3 *3*	798.2	(9/2⁺)	597.2	13/2⁺		
201.3 *1*	96 *12*	201.28	7/2⁻	0.0	3/2⁻	Q	γ-ray anisotropy 1.4 *1*.
205.7 *1*	5.5 *4*	727.16	11/2⁻	521.38	9/2⁻	D+Q	γ-ray anisotropy 0.4 *1*.
209.8 *1*	13.9 *7*	573.9	11/2⁻	364.0	9/2⁻	D+Q	γ-ray anisotropy 0.2 *1*.
218.2 *1*	12.8 *7*	815.5	15/2⁺	597.2	13/2⁺	D+Q	γ-ray anisotropy 0.3 *1*.
225.7 *1*	6.9 *10*	302.98	5/2⁻	77.26	5/2⁻		
227.0 *1*	2.5 *5*	1205.5	(13/2⁺)	978.5	(11/2⁺)		
230.2 *5*	≈0.1	431.85	7/2⁻	201.28	7/2⁻		
235.7 *1*	2.7 *3*	809.6	13/2⁻	573.9	11/2⁻	D+Q	γ-ray anisotropy 0.3 *1*.
236.6 *2*	1.6 *2*	964.22	(13/2⁻)	727.16	11/2⁻	D+Q	γ-ray anisotropy 0.2 *1*.
239.5 *1*	3.8 *8*	1055.2	17/2⁺	815.5	15/2⁺	D+Q	γ-ray anisotropy 0.3 *1*.
245.1 *2*	0.7 *1*	1450.6	(15/2⁺)	1205.5	(13/2⁺)		
253.2 *1*	41 *3*	330.40	9/2⁻	77.26	5/2⁻	Q	γ-ray anisotropy 1.8 *1*.
272.7 *1*	100 *5*	350.02	7/2⁻	77.26	5/2⁻	D+Q	γ-ray anisotropy 1.1 *1*.
282.5 *2*	0.8 *2*	613.02	9/2⁻	330.40	9/2⁻		
286.8 *5*	<0.1	364.0	9/2⁻	77.26	5/2⁻		
289.5 *1*	4.0 *4*	639.52	5/2⁻	350.02	7/2⁻		

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$^{186}W(^{18}O,^{17}O\gamma)$ 2008Sh12 (continued)

$\gamma(^{187}W)$ (continued)

E_γ	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
303.1 *2*	2.7 *8*	302.98	5/2⁻	0.0	3/2⁻	D+Q	γ-ray anisotropy 0.4 *1*.
310.1 *1*	3.9 *4*	613.02	9/2⁻	302.98	5/2⁻		
337.0 *1*	20.8 *10*	538.28	11/2⁻	201.28	7/2⁻	Q	γ-ray anisotropy 2.2 *1*.
354.2 *2*	8.8 *19*	431.85	7/2⁻	77.26	5/2⁻		
364.7 *1*	2.1 *2*	796.62	11/2⁻	431.85	7/2⁻	Q	γ-ray anisotropy 1.7 *2*.
377.0 *2*	4.6 *7*	727.16	11/2⁻	350.02	7/2⁻	Q	γ-ray anisotropy 2.7 *6*.
380.0 *1*	9.4 *6*	710.40	13/2⁻	330.40	9/2⁻	Q	γ-ray anisotropy 1.9 *2*.
388.0 *1*	28 *5*	798.2	(9/2⁺)	410.0	11/2⁺		γ-ray anisotropy 1.2 *1*.
405.1 *2*	5.5 *11*	815.5	15/2⁺	410.0	11/2⁺	Q	γ-ray anisotropy 1.8 *2*.
407.3 *2*	0.7 *1*	1205.5	(13/2⁺)	798.2	(9/2⁺)		
410.8 *5*	≈0.1	613.02	9/2⁻	201.28	7/2⁻		
443.3 *2*	1.7 *3*	964.22	(13/2⁻)	521.38	9/2⁻		
445.7 *2*	8.2 *5*	809.6	13/2⁻	364.0	9/2⁻		γ-ray anisotropy 1.9 *3*.
450.0 *2*	0.8 *2*	1063.02	13/2⁻	613.02	9/2⁻	Q	γ-ray anisotropy 2.1 *4*.
458.1 *1*	2.7 *5*	1055.2	17/2⁺	597.2	13/2⁺	Q	γ-ray anisotropy 1.4 *2*.
466.3 *1*	2.7 *3*	796.62	11/2⁻	330.40	9/2⁻		γ-ray anisotropy 1.7 *2*.
468.0 *1*	3.1 *3*	1006.28	15/2⁻	538.28	11/2⁻		
496.3 *2*	1.4 *2*	1311.8	(19/2⁺)	815.5	15/2⁺		
498.5 *1*	2.1 *3*	1072.4	(15/2⁻)	573.9	11/2⁻		
501.5 *2*	0.7 *2*	1228.66	(15/2⁻)	727.16	11/2⁻		
502.8 *2*	0.8 *2*	1213.20	(17/2⁻)	710.40	13/2⁻		
550.3 *2*	1.0 *2*	1359.9	(17/2⁻)	809.6	13/2⁻		
568.7 *1*	1.8 *6*	978.5	(11/2⁺)	410.0	11/2⁺	D+Q	γ-ray anisotropy 0.4 *1*.
587‡		1650.0	(17/2⁻)	1063.02	13/2⁻		
590.5 *1*	0.2 *1*	1596.78	(19/2⁻)	1006.28	15/2⁻		
619‡	≈0.1	1832.2	(21/2⁻)	1213.20	(17/2⁻)		
694.9 *2*	0.8 *2*	1233.18	(15/2⁻)	538.28	11/2⁻		
777.7 *2*	0.2 *1*	1784.0	(19/2⁻)	1006.28	15/2⁻		

† From γ-ray anisotrophy (obtained from Dr. Toshiyuki Shizuma through a private communication − not reported in 2008Sh12). The γ-ray anisotropy was obtained from the γ-ray intensity ratio R=Iγ(in−plane)/Iγ(out−plane). The in-plane Iγ is defined by the measured Iγ at the incoming and outgoing ions plane. For R, a value greater than unity the γ-ray multipolarity is expected to be stretched quadrupole Q (ΔJ=2) and unstretched (pure) dipole D (ΔJ=0), while for R less than unity stretched dipole D (Δ=1) is expected by 2008Sh12.

‡ Placement of transition in the level scheme is uncertain.

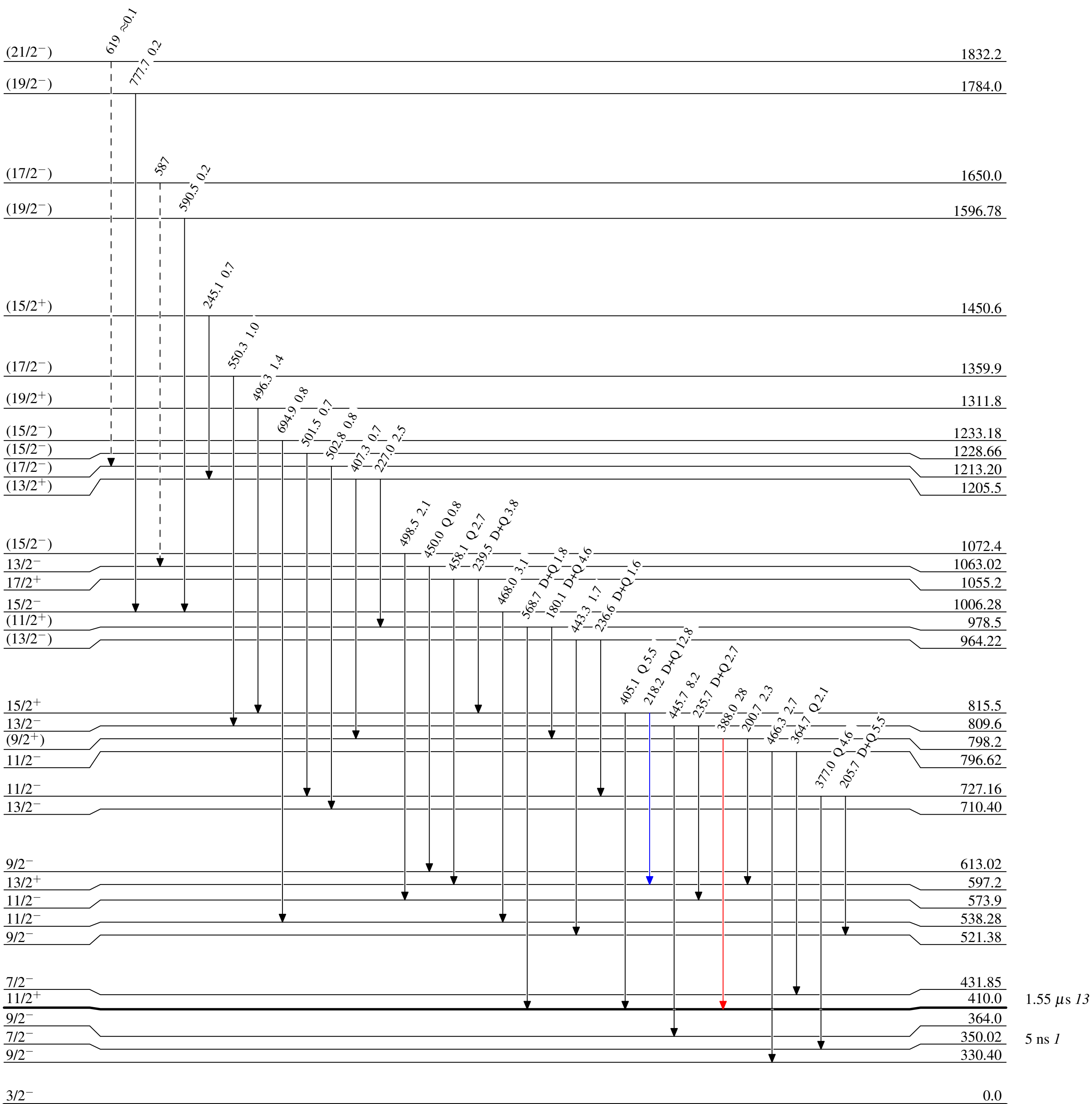
$^{186}W(^{18}O,^{17}O\gamma)$ 2008Sh12

Level Scheme

Intensities: Relative I_γ

Legend

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



$^{187}_{74}W_{113}$

$^{186}W(^{18}O,^{17}O\gamma)$ 2008Sh12

Level Scheme (continued)

Intensities: Relative I_γ