^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan and A. A. Sonzogni	NDS 115, 135 (2014)	1-Nov-2013

2007An21: E(^{36}Ar)=111 MeV. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) and γγ(lin pol) using EXOGAM array consisting of 10 segmented Clover detectors. Channel selection performed with the Neutron Wall (45 liquid scintillators) and DIAMANT (80 CsI detectors).

1994Ka20: E(^{36}Ar)=149 MeV. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) using 12 Compton-suppressed Ge detectors. Channel selection performed with 7 neutron (NE213) plastic scintillators and 4 ΔE Si surface-barrier detectors. In a separate experiment with E(^{36}Ar)=140 MeV, measured $T_{1/2}$ using RDM and a plunger apparatus.

1992We02: E(^{36}Ar)=145 MeV. Measured Eγ, Iγ, γγ, γγ(θ)(DCO) using 12 Compton-suppressed Ge detectors. Channel selection performed with 7 neutron (NE213) plastic scintillators and 4 ΔE Si surface-barrier detectors.

Others: 2013Zh10 using E(^{36}Ar)=111 MeV; measured γ(θ) and asymmetry for 741γ and 586γ. 1995We03 using ^{58}Ni(^{32}S,2pγ), E(^{32}S)=110 MeV; measured mean g-factor of 6^+ and 8^+ yrast states using IMPAD technique. 1991Gr18 using ^{40}Ca(^{50}Cr,2pγ), E(^{40}Ca)=170 MeV; observed yrast band up to the 8^+ level.

^{88}Mo Levels

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	Comments
0.0[@]	0^+		
740.60[@] *10*	2^+	7.14 ps *21*	
1495.09 *14*	2^+		
1654.91[@] *14*	4^+	0.97 ps *14*	
2091.96 *22*	(3^+)		
2402.20 *17*			
2626.86[@] *16*	6^+	8.0 ps *3*	g=+0.54 *26* g: from IMPAD technique (1995We03). Mean g-factor for the 6^+ and 8^+ yrast states, dominated by the 8^+ g-factor.
2646.49[&] *16*	5^-	13.7 ps *3*	
2672.1 *3*	(5^+)		
2904.01 *19*			
2963.09 *17*	(6^+)		
3047.0 *3*			
3187.69 *19*	(6)		
3212.98[@] *18*	8^+	22.2 ps *3*	g=+0.54 *26* g: from IMPAD technique (1995We03). Mean g-factor for the 6^+ and 8^+ yrast states, dominated by the 8^+ g-factor.
3213.51 *25*	(6)		
3349.89[&] *17*	7^-	4.6 ps *6*	
3484.70 *20*	(8^+)	<3.5 ps	
3489.76 *18*			
3642.5 *4*			
3662.99 *19*	9^-		
3816.20 *23*	(8^+)		
4063.8 *3*	(7,8)		
4119.34 *19*			
4195.24[@] *20*	10^+	4.37 ps *7*	
4313.89[&] *18*	9^-	2.6 ps *3*	
4358.23 *20*	(10^+)		
4611.22 *22*	(10^+)		
4822.42 *22*			
4988.8 *4*			
5052.55[@] *21*	12^+	18.0 ps *14*	

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^{58}Ni(^{36}Ar,α2pγ) **1992We02,1994Ka20,2007An21 (continued)**

^{88}Mo Levels (continued)

E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	E(level)[†]	J^{π}[#]	$T_{1/2}$[‡]	E(level)[†]	J^{π}[#]
5153.52[&] *19*	11^-	1.2 ps *3*	6948.02 *24*	(16)		9336.5 *3*	$(19)^-$
5270.1 *4*			7322.86 *23*	(16^+)	<0.35 ps	9400.3[@] *3*	$(20)^+$
5272.43 *21*	(12^+)	0.55 ps *14*	7350.30 *23*			9472.1 *3*	$(20)^+$
5387.64 *21*	(12^+)		7765.49 *23*	$(17)^+$		9710.9 *3*	
5959.33[@] *21*	14^+	5.67 ps *6*	7848.5[&] *3*	17^-	1.25 ps *7*	9829.2 *3*	(20)
5969.82[&] *22*	13^-	0.90 ps *14*	8127.40[@] *24*	$(18)^+$	<0.35 ps	10181.7 *4*	
6207.02 *21*	(14^+)	1.80 ps *14*	8267.6 *3*	$(17)^-$		10203.7 *3*	(21)
6549.51 *22*	$(15)^+$	0.49 ps *14*	8609.5 *3*	$(18)^-$	<0.5 ps	10358.4 *3*	
6868.33[&] *24*	15^-	3.54 ps *21*	8931.4 *3*			11079.6 *3*	$(22)^+$
6944.79[@] *23*	$(16)^+$	<0.6 ps	8968.2 *3*	(19)		11616.6 *3*	(23)

† From a least-squares fit to Eγ by evaluators.
‡ From Recoil distance Doppler-shift measurements (1994Ka20).
# From the Adopted Levels.
@ Band(A): Yrast band.
& Band(B): Negative parity cascade.

γ(^{88}Mo)

E_{γ}[†]	I_{γ}[‡]	E_i(level)	J_i^{π}	E_f	J_f^{π}	Mult.[#]	δ[d]	Comments
154.6 *1*	0.6 *1*	10358.4		10203.7	(21)			
163.0 *1*	2.4 *1*	4358.23	(10^+)	4195.24	10^+	M1(+E2)	<1.1	R(DCO)=0.67 *7* (1992We02,1994Ka20). Mult.: stretched D from R(DCO), $\Delta\pi$=no from level scheme.
247.7 *1*	1.5 *1*	6207.02	(14^+)	5959.33	14^+	M1(+E2)	<0.7	R(DCO)=0.87 *12* (1992We02,1994Ka20). Mult.: D from comparison to RUL, $\Delta\pi$=no from level scheme.
253.0 *1*	1.6 *1*	4611.22	(10^+)	4358.23	(10^+)	D(+Q)[c]	<0.5	R(DCO)=1.01 *12* (1992We02,1994Ka20).
257.5 *1*	0.9 *1*	2904.01		2646.49	5^-			
271.7 *1*	5.4 *1*	3484.70	(8^+)	3212.98	8^+	D(+Q)[c]	<0.6	R(DCO)=0.88 *6* (1994Ka20), 1.09 *4*, POL=+0.2 *1* (2007An21).
313.1[@] *1*	2.6[@] *5*	3662.99	9^-	3349.89	7^-	E2		R(DCO)=1.07 *10*, POL=+0.2 *1* (2007An21).
321.9 *1*	2.5 *1*	8931.4		8609.5	$(18)^-$			R(DCO)=0.69 *12* (1992We02).
331.1 *1*	1.2 *1*	5153.52	11^-	4822.42				
342.5 *1*	2.1 *1*	6549.51	$(15)^+$	6207.02	(14^+)			
358.6 *1*	3.9 *1*	8968.2	(19)	8609.5	$(18)^-$	D+Q[c]		R(DCO)=0.42 *7* (1992We02,1994Ka20). δ: −0.12 *6* or −3.1 *+6−8* (1994Ka20).
361.7 *1*	9.4 *2*	8127.40	$(18)^+$	7765.49	$(17)^+$	D(+Q)[c]	−0.01 *4*	R(DCO)=0.55 *5* (1992We02,1994Ka20). δ: −0.01 *4* or −4.8 *+8−11* (1994Ka20), the latter is excluded by comparison to RUL.
374.6 *1*	5.7 *1*	10203.7	(21)	9829.2	(20)	D+Q[c]		R(DCO)=0.49 *3* (1992We02,1994Ka20). δ: −0.05 *3* or −4.0 *4*.
386.9 *2*	0.9 *1*	3349.89	7^-	2963.09	(6^+)			R(DCO)=0.93 *20* (1992We02).
395.2 *1*	10.8 *1*	6944.79	$(16)^+$	6549.51	$(15)^+$	D+Q[c]		R(DCO)=0.57 *5* (1992We02,1994Ka20). δ: 0.0 *4* or −5.2 *+9−13*.
398.5 *1*	1.5 *1*	6948.02	(16)	6549.51	$(15)^+$	D+Q[c]		R(DCO)=0.46 *17* (1992We02,1994Ka20). δ: −0.09 *+14−18* or −3.5 *+14−33*.
415.3 *1*	1.4 *1*	7765.49	$(17)^+$	7350.30				R(DCO)=1.28 *18* (1992We02).
419.0 *1*	0.7 *1*	8267.6	$(17)^-$	7848.5	17^-	D+Q[c]		δ: +1.0 *+5−3* or −0.7 *3*. R(DCO)=0.77 *16* (1992We02,1994Ka20).

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^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21 (continued)

γ(^{88}Mo) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[d]	Comments
441		5052.55	12+	4611.22	(10+)			
442.5[&] 2	≈7	7765.49	(17)+	7322.86	(16+)			
445[&]		3349.89	7−	2904.01				
454.8[@] 3	0.5[@] 1	3642.5		3187.69	(6)			
492.8 1	2.2 1	9829.2	(20)	9336.5	(19)−	D+Q[c]		R(DCO)=0.53 6 (1992We02,1994Ka20). δ: −0.02 5 or −4.6 +9−13.
541.2[@] 1	6.2[@] 4	3187.69	(6)	2646.49	5−	D		R(DCO)=0.5 1, POL<0.05 (2007An21).
567.0[@] 2	2.0[@] 3	3213.51	(6)	2646.49	5−	D		R(DCO)=0.7 1, POL<0.06 (2007An21).
571.7 1	1.8 1	5959.33	14+	5387.64	(12+)	(E2)[a]		R(DCO)=1.06 13 (1992We02).
580.1[@] 2	2.3[@] 3	2672.1	(5+)	2091.96	(3+)	(E2)		R(DCO)=1.0 1 (2007An21).
585[&]	<1	3489.76		2904.01				
586.1 1	49.7 3	3212.98	8+	2626.86	6+	E2		R(DCO)=1.04 2 (1992We02), 1.04 1, POL=+0.10 2 (2007An21), A_2=+0.27 2, A_4=−0.08 3, POL=+0.11 3 (2013Zh10).
590.2 1	20.7 2	6549.51	(15)+	5959.33	14+	D+Q[c]	−0.05 3	R(DCO)=0.51 3 (1992We02,1994Ka20). δ: −0.05 3 or −4.0 4 (1994Ka20), the latter is excluded by comparison to RUL.
596.9[@] 2	2.6[@] 3	2091.96	(3+)	1495.09	2+	(M1+E2)		R(DCO)=1.3 2, POL=−0.06 5 (2007An21).
629.6[&] 1	<4.2	4119.34		3489.76				
694.3 1	1.9 1	5052.55	12+	4358.23	(10+)			
703[&]	≈1	4822.42		4119.34				
703.4[&] 1	≈30	3349.89	7−	2646.49	5−	E2		R(DCO)=1.12 4 (1992We02), 0.98 2, POL=+0.08 2 (2007An21).
709.6[&] 2	≈3	10181.7		9472.1	(20)+			
711[&]	<1	4195.24	10+	3484.70	(8+)			
723.0 1	3.1 1	3349.89	7−	2626.86	6+	E1(+M2)	+0.06 9	R(DCO)=0.65 11 (1992We02,1994Ka20). Mult.: D(+Q) from R(DCO), Δπ=yes from level scheme.
727.1 1	1.7 1	9336.5	(19)−	8609.5	(18)−	D+Q[c]		R(DCO)=0.33 11 (1992We02, 1994Ka20). δ: −0.21 +11−14 or −2.4 +7−9.
740.6 1	100	740.60	2+	0.0	0+	E2		R(DCO)=1.09 3 (1992We02), 1.12 3, POL=+0.07 1 (2007An21), A_2=+0.22 2, A_4=−0.15 3, POL=+0.068 7 (2013Zh10).
754.5[@] 1	4.4[@] 3	1495.09	2+	740.60	2+	M1+E2		R(DCO)=1.0 1 (2007An21).
761.0 1	14.2 2	8609.5	(18)−	7848.5	17−	D+Q[c]		R(DCO)=0.56 3 (1994Ka20). δ: 0.0 3 or −5.0 +5−7.
795.0 1	1.5 1	4611.22	(10+)	3816.20	(8+)			
800.9 1	1.9 1	7350.30		6549.51	(15)+			
816[&]	<1	7765.49	(17)+	6948.02	(16)			
816.3[&] 1	≈28	5969.82	13−	5153.52	11−	E2[a]		R(DCO)=1.14 3 (1992We02).
820.4 1	6.6 2	7765.49	(17)+	6944.79	(16)+	D+Q[c]		R(DCO)=0.59 7 (1992We02,1994Ka20). δ: +0.02 6 or −5.6 +13−24.
839.6 1	29.5 3	5153.52	11−	4313.89	9−	E2		R(DCO)=1.01 4 (1992We02), 1.00 4, POL=+0.13 3 (2007An21).
843.3 1	2.9 1	3489.76		2646.49	5−			
850.2[@] 4	0.5[@] 1	4063.8	(7,8)	3213.51	(6)			
857.3 1	27.3 3	5052.55	12+	4195.24	10+	E2		R(DCO)=1.04 4 (1992We02), 0.98 3, POL=+0.09 4 (2007An21).
873.5 1	4.4 1	4358.23	(10+)	3484.70	(8+)	E2		R(DCO)=1.32 10 (1992We02), 1.09 5, POL=+0.15 7 (2007An21).
876.1[@] 2	1.1[@] 2	4063.8	(7,8)	3187.69	(6)			

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^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21 (continued)

γ(^{88}Mo) (continued)

Eγ[†]	Iγ[‡]	Ei(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
898[&]	≈1	9829.2	(20)	8931.4			
898.5[&] 1	≈30	6868.33	15⁻	5969.82	13⁻	E2[a]	R(DCO)=0.86 3 (1992We02).
906.8 1	24.1 3	5959.33	14⁺	5052.55	12⁺	E2[a]	R(DCO)=0.97 4 (1992We02).
907.1[&@] 1	0.8[@] 1	2402.20		1495.09	2⁺		
914[&]		5272.43	(12⁺)	4358.23	(10⁺)		
914.3 1	100.0 5	1654.91	4⁺	740.60	2⁺	E2	R(DCO)=0.98 2 (1992We02), 1.0 1, POL=+0.08 1 (2007An21).
925.0[@] 3	0.9[@] 1	4988.8		4063.8	(7,8)		
934.6 1	7.2 2	6207.02	(14⁺)	5272.43	(12⁺)	(E2)[a]	R(DCO)=0.94 6 (1992We02).
955.0[&@] 2	0.9[@] 1	3047.0		2091.96	(3⁺)		
956.2[&@] 3	0.6[@] 1	5270.1		4313.89	9⁻		
964.0 1	32.2 3	4313.89	9⁻	3349.89	7⁻	E2	R(DCO)=0.99 4 (1992We02), 1.14 3, POL=+0.06 2 (2007An21).
971.9 1	62.0 4	2626.86	6⁺	1654.91	4⁺	E2	R(DCO)=1.05 4 (1992We02), 1.00 1, POL=+0.09 1 (2007An21).
980.1 1	22.7 5	7848.5	17⁻	6868.33	15⁻	E2[a]	R(DCO)=1.02 3 (1992We02).
982.3 1	46.8 5	4195.24	10⁺	3212.98	8⁺	E2	R(DCO)=1.01 5 (1992We02), 0.92 2, POL=+0.07 2 (2007An21).
985[&]		6944.79	(16)⁺	5959.33	14⁺		
991.6 1	41.1 3	2646.49	5⁻	1654.91	4⁺	E1	R(DCO)=0.50 2 (1992We02), 0.68 1, POL=+0.05 1 (2007An21).
1034.2 1	1.6 1	5153.52	11⁻	4119.34			
1077.2 1	7.2 2	5272.43	(12⁺)	4195.24	10⁺	(E2)[a]	R(DCO)=0.89 9 (1992We02).
1100.8 2	0.9 1	4313.89	9⁻	3212.98	8⁺		
1115.8 1	7.3 2	7322.86	(16⁺)	6207.02	(14⁺)	(E2)[a]	R(DCO)=0.86 9 (1992We02).
1154.4 1	2.0 1	6207.02	(14⁺)	5052.55	12⁺		
1182.8 1	6.9 2	8127.40	(18)⁺	6944.79	(16)⁺	E2[a]	R(DCO)=0.90 8 (1992We02).
1189.2[&] 3	≈2	3816.20	(8⁺)	2626.86	6⁺		
1192.4 1	5.5 2	5387.64	(12⁺)	4195.24	10⁺	(E2)[b]	R(DCO)=0.90 7 (1992We02).
1216.0 1	4.0 2	7765.49	(17)⁺	6549.51	(15)⁺	(E2)[b]	R(DCO)=1.19 18 (1992We02).
1219.7 1	4.3 2	9829.2	(20)	8609.5	(18)⁻	(E2)[b]	R(DCO)=0.90 10 (1992We02).
1235.5 1	1.0 1	10203.7	(21)	8968.2	(19)		
1257.9 2	0.4 1	11616.6	(23)	10358.4			
1272.9 1	5.8 2	9400.3	(20)⁺	8127.40	(18)⁺	(E2)[b]	R(DCO)=0.90 9 (1992We02).
1308.2 1	1.7 1	2963.09	(6⁺)	1654.91	4⁺	(E2)[b]	R(DCO)=0.81 20 (1992We02).
1344.7 2	2.4 2	9472.1	(20)⁺	8127.40	(18)⁺	(E2)[b]	R(DCO)=0.92 13 (1992We02).
1351.2[@] 4	1.6[@] 3	2091.96	(3⁺)	740.60	2⁺	(M1+E2)	R(DCO)=0.9 1 (2007An21).
1399.7 2	2.2 1	8267.6	(17)⁻	6868.33	15⁻		R(DCO)=0.77 10 (1992We02).
1413.1 2	2.1 1	11616.6	(23)	10203.7	(21)	(E2)[b]	R(DCO)=1.08 14 (1992We02).
1487.7 2	1.1 1	9336.5	(19)⁻	7848.5	17⁻		
1495.0[@] 6	0.6[@] 2	1495.09	2⁺	0.0	0⁺		
1583.5 2	1.8 1	9710.9		8127.40	(18)⁺		
1679.3 2	1.8 1	11079.6	(22)⁺	9400.3	(20)⁺	(E2)[b]	R(DCO)=0.95 18 (1992We02).

[†] From 1992We02, except where noted.
[‡] From 1992We02 at E(^{36}Ar)=145 MeV and normalized to Iγ(741γ) =100, except where noted.
[#] From γγ(θ)(DCO) and γγ(lin pol) (2007An21), except where noted.
[@] From 2007An21. Intensities are for E(^{36}Ar)=111 MeV and normalized to Iγ(741γ) =100.

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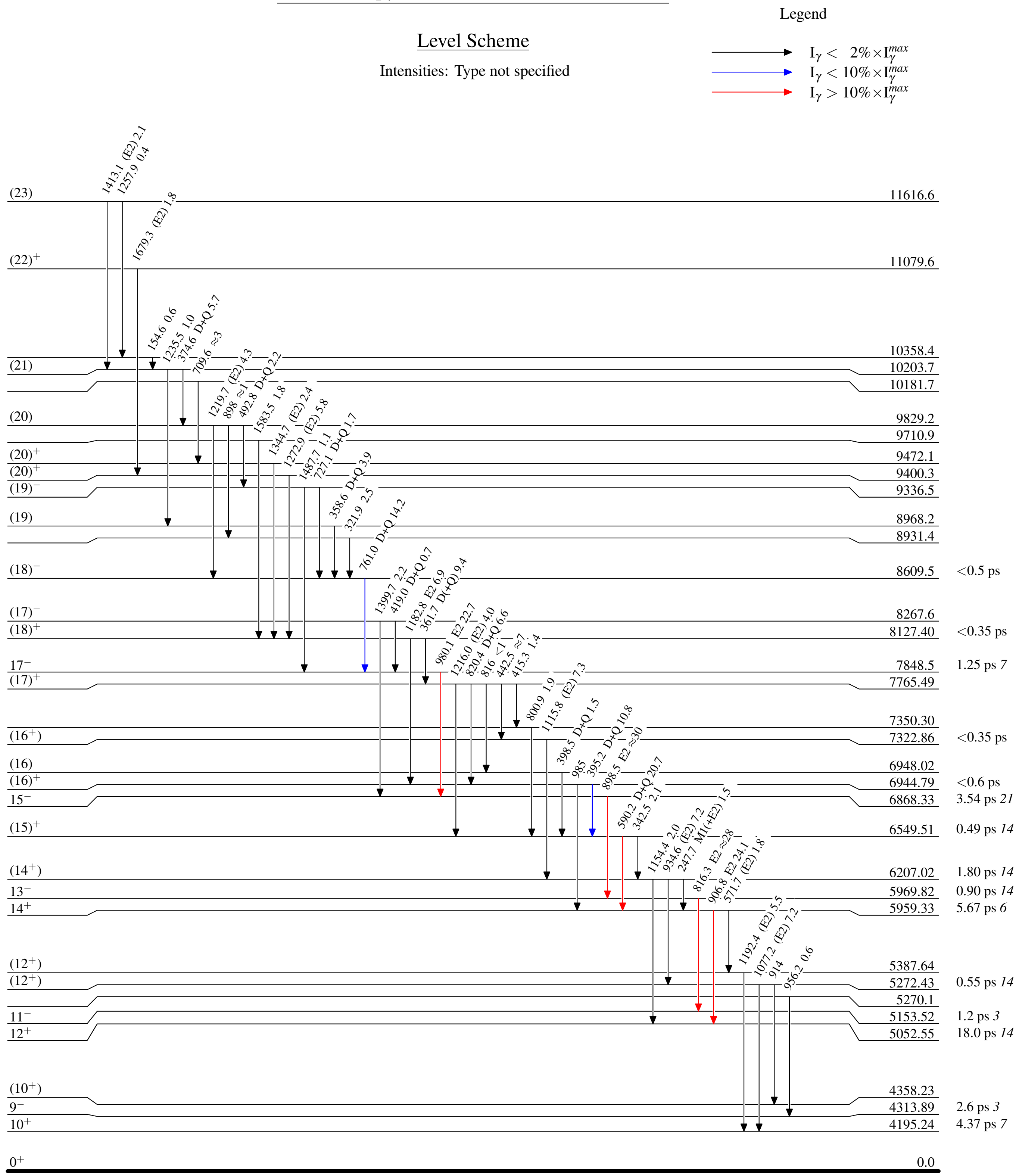
^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21 (continued)

γ(^{88}Mo) (continued)

[&] Doublet structure.
[a] Stretched Q from R(DCO), M2 excluded by comparison to RUL.
[b] Stretched Q from R(DCO), E2 from assumed band structure (1992We02).
[c] From R(DCO) measurements in 1992We02, 1994Ka20.
[d] From $\gamma(\theta)$(DCO) in ^{58}Ni(^{36}Ar,α2pγ) (1994Ka20).

^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21

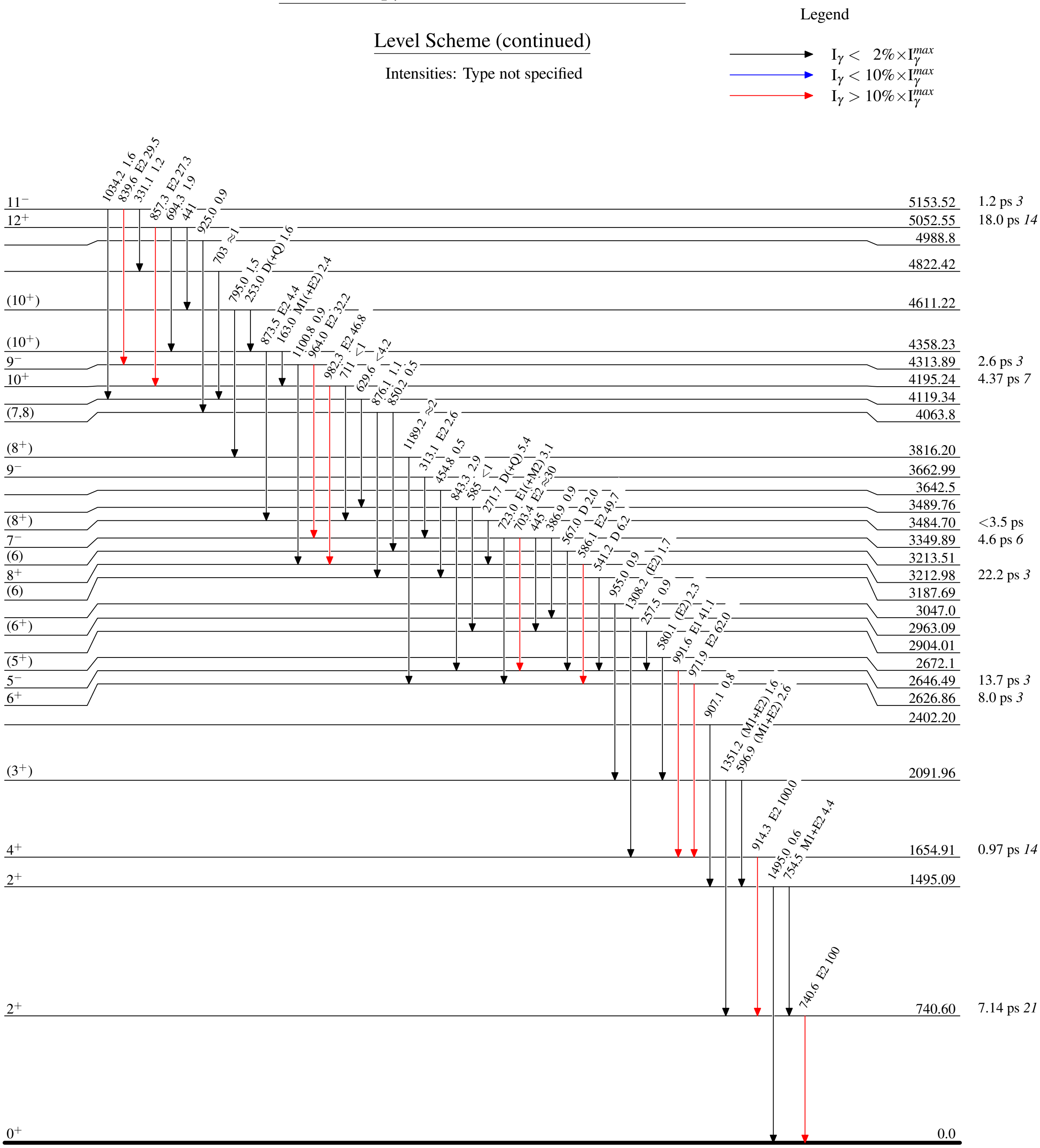


$^{88}_{42}Mo_{46}$

$^{58}Ni(^{36}Ar,\alpha 2p\gamma)$ 1992We02,1994Ka20,2007An21

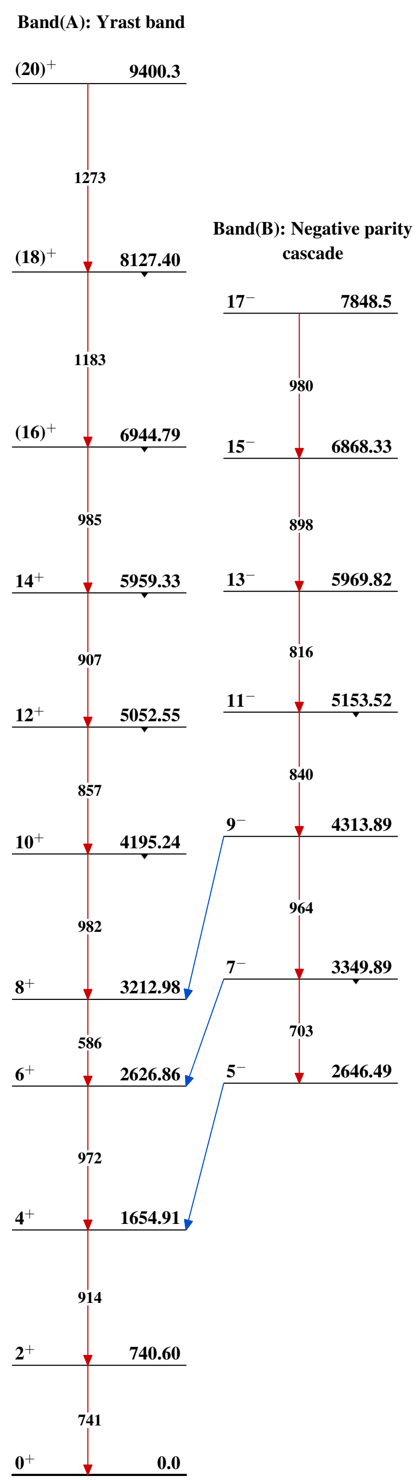
Level Scheme (continued)

Intensities: Type not specified



$^{88}_{42}Mo_{46}$

^{58}Ni(^{36}Ar,α2pγ) 1992We02,1994Ka20,2007An21



$^{88}_{42}Mo_{46}$