$^{12}C(^{40}Ca,3p\gamma),^{24}Mg(^{32}S,3p\alpha\gamma)$ 1991Ca23,1978Me19,1978Fo09

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows[a]	NDS 109, 1879 (2008)	14-Jul-2008

Also contains $^{27}Al(^{28}Si,\alpha 2p\gamma),^{40}Ca(^{12}C,3p\gamma)$.

1978Fo09: $^{24}Mg(^{32}S,3p\alpha\gamma),^{40}Ca(^{12}C,3p\gamma)$ E(^{32}S)=110 MeV. Measured γ's, $\gamma\gamma'$s, and $\gamma(\theta)$. Also measured γ-excitation functions (E(^{12}C)=20-62 MeV).

1978Me19: $^{27}Al(^{28}Si,\alpha 2p\gamma)$ E=65, 72, 77, and 82 MeV. Measured γ's and γ-excitation functions. Deduced relative σ.

1991Ca23: $^{12}C(^{40}Ca,3p\gamma)$ E=160 MeV. Measured γ's, recoil-$\gamma(\theta$=40°, 101°, 117°, 142.5°), recoil-γ coin, and recoil-$\gamma\gamma$ coin; Compton-suppressed Ge, recoil separator. See 1994Ca04 for comparison with cross-conjugate nucleus ^{47}Ti.

2005LiZX: $^{12}C(^{40}Ca,3p\gamma)$ E=230 MeV. Measured γ's and (recoil)γ-coin; FMA stand-alone experiment with one clover γ-ray detector At 90° to the beam direction. FMA focal-plane detectors consisted of micro-channel plate detectors for determination of position and ionization chamber for Z-identification through energy loss and total energy of the recoils. Test experiment to investigate if a study of ^{49}Fe spectroscopy is feasible.

Others: see 1995Bu23.

^{49}V Levels

E(level)	J^{π}[†]	Comments
0[‡]	$7/2^{-}$[#]	
89.9[‡] 6	$5/2^{-}$[@]	
747.9[&] 8	$3/2^{+}$[@]	
1021.6[‡] 4	$11/2^{-}$[@]	
1139.9[&] 7	$5/2^{+}$[#]	
1154.8[‡] 5	$9/2^{-}$[#]	
1602.9[&] 6	$7/2^{+}$[#]	
2177.9[&] 5	$9/2^{+}$[@]	
2263.3[‡] 5	$15/2^{-}$[@]	
2671.7[a] 8	$(11/2)^{-}$	
2727.6[a] 6	$15/2^{-}$[@]	
2740.9[&] 7	$11/2^{+}$	J^{π}: 11/2 from recoil-$\gamma(\theta)$ (1991Ca23). π=+ from the Adopted Levels.
2861.8[‡] 6	$13/2^{-}$[@]	
3325.5[‡] 6	$(17/2^{-})$	J^{π}: 13/2,17/2 from ΔJ=1 D γ to $15/2^{-}$ (1991Ca23). J>15/2 from excit (1978Fo09). Member of yrast band.
3742.6[‡] 7	$(19/2^{-})$	J^{π}: 15/2,19/2 from ΔJ=2) Q or ΔJ=0 D γ to $15/2^{-}$ and ΔJ=1 D to 13/2,17/2 (1991Ca23). Member of yrast band.
5530.0[‡] 8	$(21/2^{-})$[b]	
5690.1[‡] 9	$(23/2^{-})$[b]	
6845.1[a] 9	$(23/2^{-})$	J^{π}: ΔJ=1 D γ from $(25/2^{-})$ and D γ to $(23/2^{-})$ (1991Ca23). Member of negative-parity side band.
7801.7[‡] 9	$(25/2^{-})$[b]	
8416.3[‡] 10	$(27/2^{-})$	J^{π}: strong ΔJ=1 D γ to $25/2^{-}$ and weak ΔJ=2 Q γ to $23/2^{-}$ (1991Ca23).

[†] Parentheses added by the evaluator. 1978Fo09 and 1991Ca23 assumed that $J_i=J_f+1$ for stretched (ΔJ=1) dipole transitions and $J_i=J_f+2$ for stretched (ΔJ=2) quadrupole transitions.

[‡] Band(A): $5/2^{-}$ yrast band (1991Ca23).

[#] From the Adopted Levels.

[@] Recoil $\gamma(\theta)$ (1991Ca23) confirm spin and parity assignments adopted In 1995Bu23.

[&] Band(B): $K^{\pi}=3/2^{+}$ rotational band (1991Ca23).

[a] Band(C): negative parity side band (1991Ca23).

[b] From stretched (ΔJ=1) dipole or stretched (ΔJ=2) quadrupole cascade and membership In yrast band (1991Ca23).

$^{12}C(^{40}Ca,3p\gamma),^{24}Mg(^{32}S,3p\alpha\gamma)$ 1991Ca23,1978Me19,1978Fo09 (continued)

$\gamma(^{49}V)$

Coincidences are from 1991Ca23.

E(E) Adopted	TV 1978Fo09	Average of the following gamma energies: 1978Me19	1991Ca23			Adopted	1978Fo09	1978Me19	1991Ca23
±0.4	±0.5	±0.6	±1				±0.5	±0.6	±1
463.9	463.7	463.9	465	Unweighted		1241.7 *4*	1242.1	1242.1	1241
Unweighted									
1021.5	1021.4	1021.5	1022	Weighted		1479.1 *9*	1478.2		1480
Unweighted									
1062.4	1061.9	1063.0	1063	Weighted					

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ#
90 *1*	2	89.9	5/2⁻	0	7/2⁻	D@	
133d *1*	0.1d	1154.8	9/2⁻	1021.6	11/2⁻		
134d *1*	0.1d	2861.8	13/2⁻	2727.6	15/2⁻		
160 *1*	1	5690.1	(23/2⁻)	5530.0	(21/2⁻)		
392 *1*	0.2	1139.9	5/2⁺	747.9	3/2⁺	@	
416.9&b *5*	28	3742.6	(19/2⁻)	3325.5	(17/2⁻)	D+Q#@	−2.0 *4*
463d *1*	2d	1602.9	7/2⁺	1139.9	5/2⁺		
463.9d *4*	3d	2727.6	15/2⁻	2263.3	15/2⁻	D,Qa	
464d *1*	14d	3325.5	(17/2⁻)	2861.8	13/2⁻	D,Qa	
563 *1*	0.5	2740.9	11/2⁺	2177.9	9/2⁺		
575 *1*	0.3	2177.9	9/2⁺	1602.9	7/2⁺		
597.1d& *5*	8d	3325.5	(17/2⁻)	2727.6	15/2⁻	D@	
599db *1*	8d	2861.8	13/2⁻	2263.3	15/2⁻	D@	
613 *1*	2	8416.3	(27/2⁻)	7801.7	(25/2⁻)	D@	
658 *1*	4	747.9	3/2⁺	89.9	5/2⁻	D	
855 *1*	0.5	1602.9	7/2⁺	747.9	3/2⁺		
956 *1*	8	7801.7	(25/2⁻)	6845.1	(23/2⁻)	D@	
1021.5db *4*	100d	1021.6	11/2⁻	0	7/2⁻	D,Qa	
1023d *1*	5d	2177.9	9/2⁺	1154.8	9/2⁻		
1038 *1*	0.7	2177.9	9/2⁺	1139.9	5/2⁺		
1062.4dcb *4*	38d	3325.5	(17/2⁻)	2263.3	15/2⁻	D@	
1065d *1*	2d	1154.8	9/2⁻	89.9	5/2⁻		
1138d *1*	0.7d	2740.9	11/2⁺	1602.9	7/2⁺		
1140d *1*	4d	1139.9	5/2⁺	0	7/2⁻	D	
1155db *1*	5d	1154.8	9/2⁻	0	7/2⁻	D@	
1155db *1*	8d	6845.1	(23/2⁻)	5690.1	(23/2⁻)	D@	
1156d *1*	11d	2177.9	9/2⁺	1021.6	11/2⁻	D@	
1241.7b *4*	93	2263.3	15/2⁻	1021.6	11/2⁻	D,Qa	
1315 *1*	0.5	6845.1	(23/2⁻)	5530.0	(21/2⁻)		
1479.1b *9*	26	3742.6	(19/2⁻)	2263.3	15/2⁻	D,Qa	
1513 *1*	2	1602.9	7/2⁺	89.9	5/2⁻		
1517d *1*	1d	2671.7	(11/2)⁻	1154.8	9/2⁻		
1586 *1*	2	2740.9	11/2⁺	1154.8	9/2⁻		
1603 *1*	1	1602.9	7/2⁺	0	7/2⁻		
1650 *1*	3	2671.7	(11/2)⁻	1021.6	11/2⁻		
1706d *1*	4d	2727.6	15/2⁻	1021.6	11/2⁻	D,Qa	
1707d *1*	4d	2861.8	13/2⁻	1154.8	9/2⁻	D,Qa	
1787 *1*	7	5530.0	(21/2⁻)	3742.6	(19/2⁻)	D	

Continued on next page (footnotes at end of table)

^{12}C(^{40}Ca,3pγ),^{24}Mg(^{32}S,3p$\alpha\gamma$) 1991Ca23,1978Me19,1978Fo09 (continued)

$\gamma(^{49}V)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]
1840 *1*	0.4	2861.8	$13/2^-$	1021.6	$11/2^-$	
1947 [b] *1*	37	5690.1	$(23/2^-)$	3742.6	$(19/2^-)$	D,Q [a]
2111 *1*	9	7801.7	$(25/2^-)$	5690.1	$(23/2^-)$	D [@]
2178 *1*	2	2177.9	$9/2^+$	0	$7/2^-$	
2204 *1*	3	5530.0	$(21/2^-)$	3325.5	$(17/2^-)$	
2271 *1*	0.8	7801.7	$(25/2^-)$	5530.0	$(21/2^-)$	
3102 *1*	1	6845.1	$(23/2^-)$	3742.6	$(19/2^-)$	
5690 *1*	0.9	8416.3	$(27/2^-)$	2727.6	$15/2^-$	(Q) [a]

† From 1991Ca23, except As noted. $\Delta E(\gamma)$ estimated by the evaluator from experimental details given In 1990Ca06.
‡ From recoil-$\gamma(\theta)$ In 1991Ca23, except As noted.
# From $\gamma(\theta)$ In 1978Fo09.
@ Stretched ($\Delta J=1$) dipole transition from recoil-$\gamma(\theta)$.
& From 1978Fo09.
a Stretched ($\Delta J=2$) quadrupole or $\Delta J=0$ dipole transition from recoil-$\gamma(\theta)$.
b Also reported by 2005LiZX.
c Placed As deexciting a 1063 state by 1978Me19.
d Multiply placed with intensity suitably divided.

$^{12}C(^{40}Ca,3p\gamma),^{24}Mg(^{32}S,3p\alpha\gamma)$ 1991Ca23,1978Me19,1978Fo09

Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

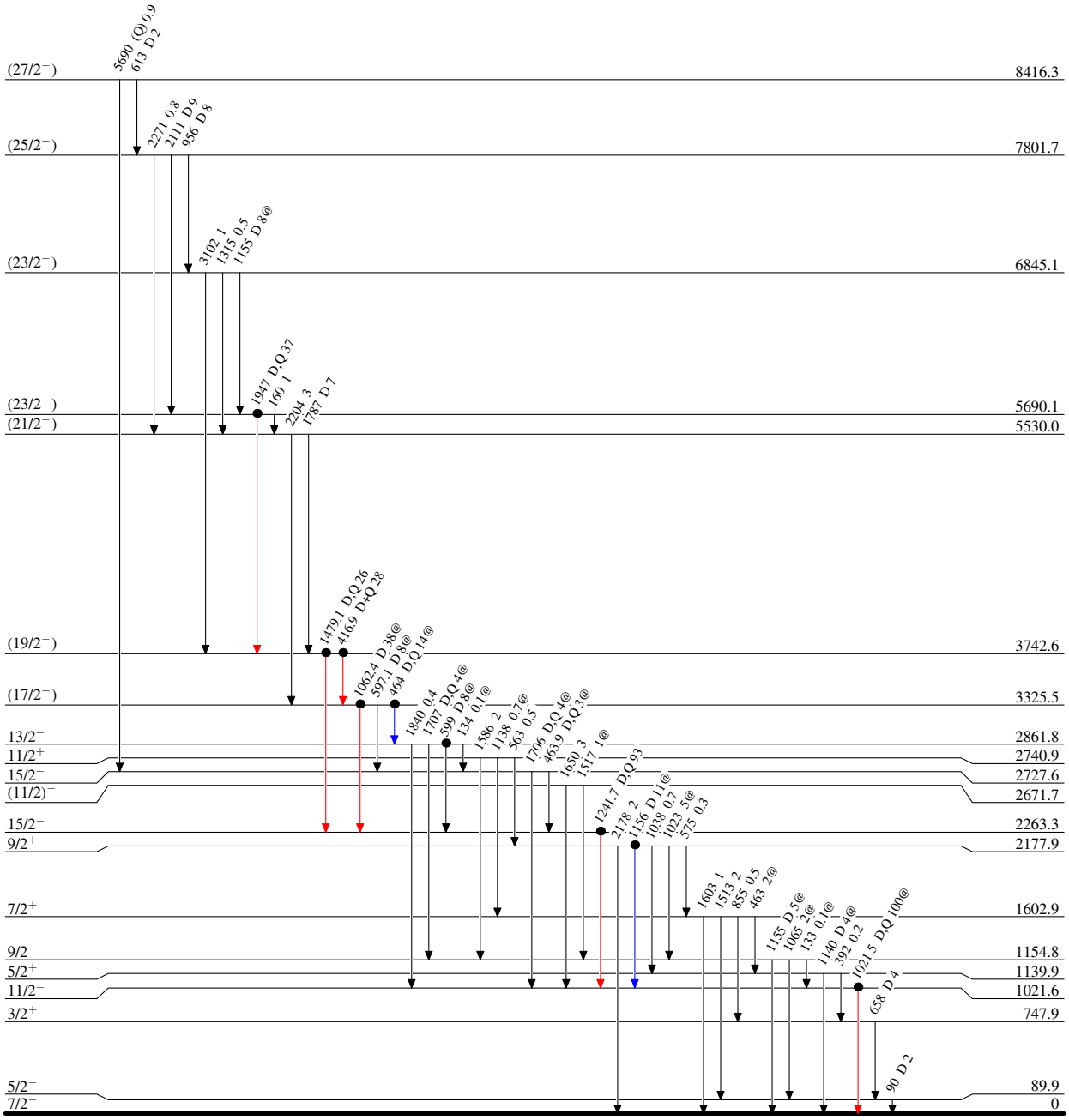
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

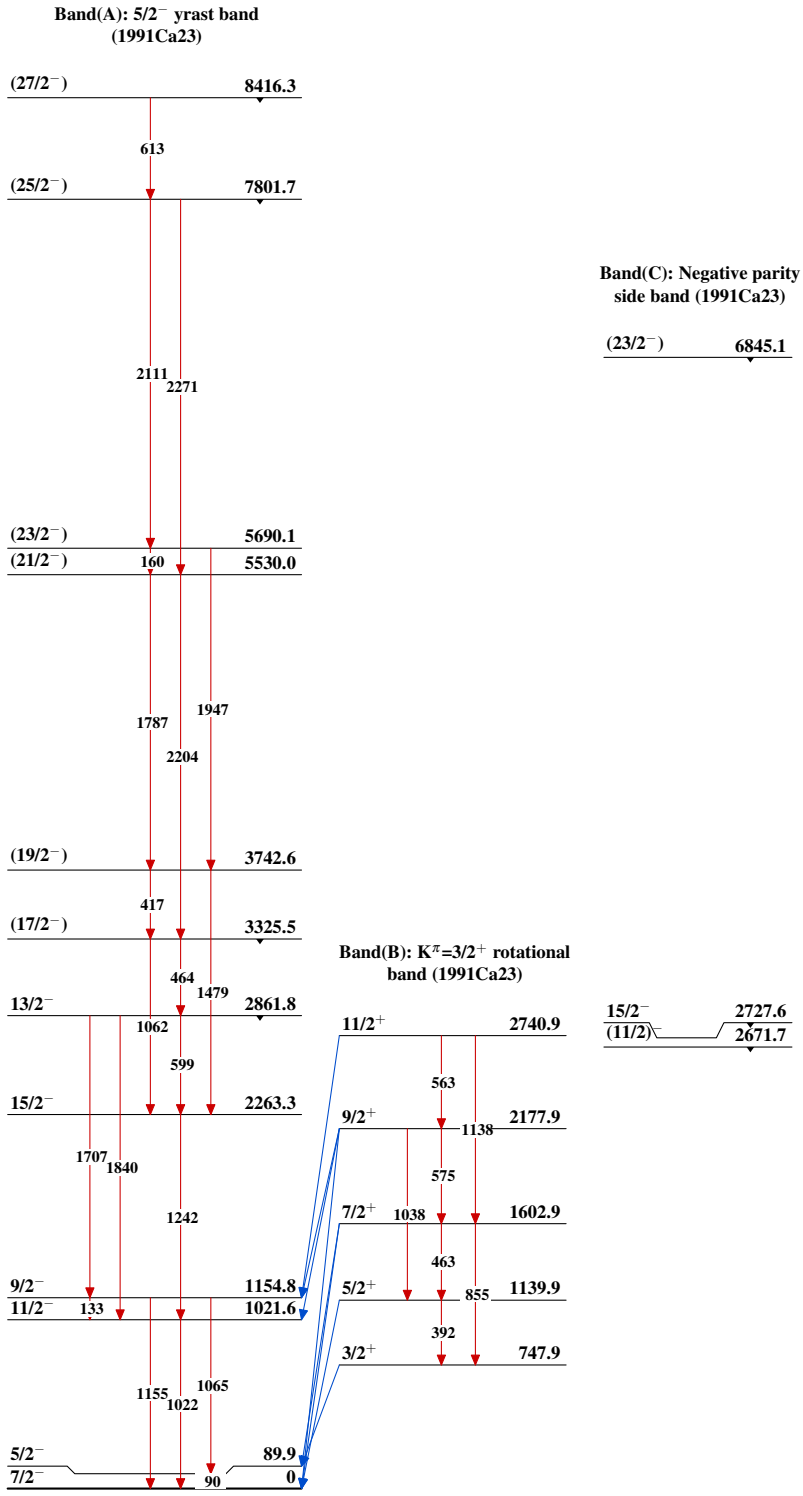
$I_\gamma > 10\% \times I_\gamma^{max}$

Coincidence



$^{49}_{23}V_{26}$

$^{12}C(^{40}Ca,3p\gamma),^{24}Mg(^{32}S,3p\alpha\gamma)$ 1991Ca23,1978Me19,1978Fo09



$^{49}_{23}V_{26}$