

⁴⁰Ca(³²S,3pn γ) 2005St08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 113, 1735 (2012)	1-Mar-2012

E(³²S)=95, 105 MeV. Measured E γ , I γ , $\gamma\gamma$ and $\gamma\gamma(\theta)$ using the EUROBALL array consisting of 15 Cluster and 26 Clover Ge detectors. Channel selection performed with the EUCLIDES charged particle array consisting of 40 Si Δ E-E telescopes and the Neutron Wall consisting of 50 liquid scintillators arranged to cover the forward 1π of EUROBALL.
 Other: 1995He27 using ⁴⁰Ca(³¹P,2pn γ), E(³¹P)=115 MeV. Measured linear polarization of 854 γ .

⁶⁸As Levels

E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]	E(level) [†]	J π [‡]
0.0	3 ⁺	1322.2 6	6 ⁽⁻⁾	2829.5 7	9 ⁽⁻⁾	4897.0 8	12 ⁽⁻⁾
157.7 5	3 ⁺	1426.9 7	6 ⁽⁻⁾	2939.2 10	9	5002.3? 15	
213.7 5	4 ⁺	1849.6 5	7 ⁽⁻⁾	2981.9 6	9 ⁽⁻⁾	5087.3 15	13 ⁽⁺⁾
313.2 3	(4) ⁺	1955.0 6	7 ⁽⁻⁾	3169.2 11	10 ⁽⁺⁾	5652.5 8	(13 ⁻)
500.0 6	4 ⁺	2058.6 8		3182.3 9	11 ⁽⁺⁾	6063.4 15	15 ⁽⁺⁾
549.3 3	4 ⁺	2093.1 7	8 ⁽⁻⁾	3625.9 8	10 ⁽⁻⁾	6803.6 8	(15 ⁻)
732.4 7	5 ⁺	2157.2 8	9 ⁽⁺⁾	3718.1 7	10 ⁽⁻⁾	7709.4 18	
893.1 4	4 ⁽⁻⁾	2251.1 8	(7)	3843.3 11		8499.6? 13	
964.1 6	5 ⁽⁻⁾	2300.8 6	8 ⁽⁻⁾	4319.9 8	(11 ⁻)		
1214.0 4	6 ⁽⁻⁾	2474.2 10	8	4388.3 11	12 ⁽⁺⁾		
1303.1 6	7 ⁽⁻⁾	2659.3 9		4585.4 11			

[†] From a least-squares fit to E γ , by evaluator. Δ E=1 keV assumed when not explicitly stated.

[‡] Assignments from 2005St08 based on measured DCO ratios and observed decay patterns.

γ (⁶⁸As)

E γ [†]	E _i (level)	J π _i	E _f	J π _f	Mult. [‡]	Comments
56	213.7	4 ⁺	157.7	3 ⁺		
64	2157.2	9 ⁽⁺⁾	2093.1	8 ⁽⁻⁾		
71	964.1	5 ⁽⁻⁾	893.1	4 ⁽⁻⁾		
156	313.2	(4) ⁺	157.7	3 ⁺		
158	157.7	3 ⁺	0.0	3 ⁺		
183	732.4	5 ⁺	549.3	4 ⁺		
187	500.0	4 ⁺	313.2	(4) ⁺		
214	213.7	4 ⁺	0.0	3 ⁺		
223	2474.2	8	2251.1	(7)		
232	964.1	5 ⁽⁻⁾	732.4	5 ⁺		
236.1 1	549.3	4 ⁺	313.2	(4) ⁺	D [#]	R _{DCO} =0.97 25.
250	1214.0	6 ⁽⁻⁾	964.1	5 ⁽⁻⁾		
286	500.0	4 ⁺	213.7	4 ⁺		
313.2 4	313.2	(4) ⁺	0.0	3 ⁺	D [@]	R _{DCO} =0.55 16.
317	2474.2	8	2157.2	9 ⁽⁺⁾		
320.8 2	1214.0	6 ⁽⁻⁾	893.1	4 ⁽⁻⁾	Q	R _{DCO} =0.96 19 (Δ J=0, dipole gated).
336	549.3	4 ⁺	213.7	4 ⁺		
339.0 1	1303.1	7 ⁽⁻⁾	964.1	5 ⁽⁻⁾	Q	R _{DCO} =1.02 4 (Δ J=0, dipole gated).
343.8 2	893.1	4 ⁽⁻⁾	549.3	4 ⁺	D [#]	R _{DCO} =0.97 9.
358.1 1	1322.2	6 ⁽⁻⁾	964.1	5 ⁽⁻⁾	D [@]	R _{DCO} =0.52 11 (Δ J=0, dipole gated).
392	549.3	4 ⁺	157.7	3 ⁺		
393	893.1	4 ⁽⁻⁾	500.0	4 ⁺		

Continued on next page (footnotes at end of table)

⁴⁰Ca(³²S,3pn γ) 2005St08 (continued)

γ (⁶⁸As) (continued)

E_γ †	E_i (level)	J_i^π	E_f	J_f^π	Mult. ‡	Comments
415	964.1	5 ⁽⁻⁾	549.3	4 ⁺		
463	1426.9	6 ⁽⁻⁾	964.1	5 ⁽⁻⁾		
465	2939.2	9	2474.2	8		
500	500.0	4 ⁺	0.0	3 ⁺		
519	732.4	5 ⁺	213.7	4 ⁺		
528	1955.0	7 ⁽⁻⁾	1426.9	6 ⁽⁻⁾		
529&	2829.5	(9 ⁻)	2300.8	8 ⁽⁻⁾		
549	549.3	4 ⁺	0.0	3 ⁺		
577	4897.0	12 ⁽⁻⁾	4319.9	(11 ⁻)		
579.9 3	893.1	4 ⁽⁻⁾	313.2	(4) ⁺	D#	R _{DCO} =0.8 3.
601	2659.3		2058.6			
632	2058.6		1426.9	6 ⁽⁻⁾		
632.8 2	1955.0	7 ⁽⁻⁾	1322.2	6 ⁽⁻⁾	D@	R _{DCO} =1.1 4 ($\Delta J=1$, dipole gated).
635.6 2	1849.6	7 ⁽⁻⁾	1214.0	6 ⁽⁻⁾	@	R _{DCO} =0.8 5.
651.9 3	1955.0	7 ⁽⁻⁾	1303.1	7 ⁽⁻⁾	D#	R _{DCO} =1.08 19.
661	3843.3		3182.3	11 ⁽⁺⁾		
681.1 2	2981.9	9 ⁽⁻⁾	2300.8	8 ⁽⁻⁾	D@	R _{DCO} =1.4 4 ($\Delta J=1$, dipole gated).
688	2939.2	9	2251.1	(7)		
699	5087.3	13 ⁽⁺⁾	4388.3	12 ⁽⁺⁾		
704	2659.3		1955.0	7 ⁽⁻⁾		
735	893.1	4 ⁽⁻⁾	157.7	3 ⁺		
736	2058.6		1322.2	6 ⁽⁻⁾		
741	1955.0	7 ⁽⁻⁾	1214.0	6 ⁽⁻⁾		
755.5 3	5652.5	(13 ⁻)	4897.0	12 ⁽⁻⁾	(D)@	R _{DCO} =0.8 3. Mult.: possible doublet component in DCO ratio, value is tentative and Q character cannot be excluded due to large uncertainty.
771	2093.1	8 ⁽⁻⁾	1322.2	6 ⁽⁻⁾		
790	2093.1	8 ⁽⁻⁾	1303.1	7 ⁽⁻⁾		
824	2251.1	(7)	1426.9	6 ⁽⁻⁾		
854	2157.2	9 ⁽⁺⁾	1303.1	7 ⁽⁻⁾	M2	Mult.: from linear polarization (1995He27).
874	2300.8	8 ⁽⁻⁾	1426.9	6 ⁽⁻⁾		
889	2981.9	9 ⁽⁻⁾	2093.1	8 ⁽⁻⁾		
904	3843.3		2939.2	9		
923	2981.9	9 ⁽⁻⁾	2058.6			
929	2251.1	(7)	1322.2	6 ⁽⁻⁾		
976.1 3	6063.4	15 ⁽⁺⁾	5087.3	13 ⁽⁺⁾	Q	R _{DCO} =1.0 5 (gate on 338 γ), R _{DCO} =1.2 3 (gate on 1025 γ).
978.6 2	2300.8	8 ⁽⁻⁾	1322.2	6 ⁽⁻⁾	Q	R _{DCO} =1.7 3, 2.4 6.
990.9 2	1955.0	7 ⁽⁻⁾	964.1	5 ⁽⁻⁾	Q	R _{DCO} =0.90 20 ($\Delta J=0$, dipole gated).
1012	3169.2	10 ⁽⁺⁾	2157.2	9 ⁽⁺⁾		
1025	3182.3	11 ⁽⁺⁾	2157.2	9 ⁽⁺⁾		
1027	2981.9	9 ⁽⁻⁾	1955.0	7 ⁽⁻⁾		
1067	5652.5	(13 ⁻)	4585.4			
1132	2981.9	9 ⁽⁻⁾	1849.6	7 ⁽⁻⁾		
1151.0 1	6803.6	(15 ⁻)	5652.5	(13 ⁻)	Q	R _{DCO} =1.2 3.
1159&	5002.3?		3843.3			
1179	4897.0	12 ⁽⁻⁾	3718.1	10 ⁽⁻⁾		
1206	4388.3	12 ⁽⁺⁾	3182.3	11 ⁽⁺⁾		
1219	4388.3	12 ⁽⁺⁾	3169.2	10 ⁽⁺⁾		
1271	4897.0	12 ⁽⁻⁾	3625.9	10 ⁽⁻⁾		
1325.0 7	3625.9	10 ⁽⁻⁾	2300.8	8 ⁽⁻⁾	Q	R _{DCO} =1.3 5.
1333&	5652.5	(13 ⁻)	4319.9	(11 ⁻)		

Continued on next page (footnotes at end of table)

$^{40}\text{Ca}(^{32}\text{S},3\text{pn}\gamma)$ **2005St08** (continued) $\gamma(^{68}\text{As})$ (continued)

E_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. ‡	Comments
1338	4319.9	(11 ⁻)	2981.9	9 ⁽⁻⁾		
1403	4585.4		3182.3	11 ⁽⁺⁾		
1417.3 5	3718.1	10 ⁽⁻⁾	2300.8	8 ⁽⁻⁾	Q	R _{DCO} =1.0 4.
1490.5 7	4319.9	(11 ⁻)	2829.5	9 ⁽⁻⁾	Q	R _{DCO} =1.4 3.
1526.3 5	2829.5	9 ⁽⁻⁾	1303.1	7 ⁽⁻⁾	Q	R _{DCO} =1.3 4 ($\Delta J=0$, dipole gated).
1533	3625.9	10 ⁽⁻⁾	2093.1	8 ⁽⁻⁾		
1625	3718.1	10 ⁽⁻⁾	2093.1	8 ⁽⁻⁾		
1646	7709.4		6063.4	15 ⁽⁺⁾		
1696 &	8499.6?		6803.6	(15 ⁻)		
1714.6 7	4897.0	12 ⁽⁻⁾	3182.3	11 ⁽⁺⁾	D@	R _{DCO} =0.59 2l.

† Values given to 1 keV are taken from Fig. 1 of **2005St08**. $\Delta E=1$ keV assumed for these transitions in the least-squares fitting.

‡ From DCO ratio in **2005St08** gated on a $\Delta J=2$, quadrupole transition, unless noted otherwise. All Q transitions correspond to $\Delta J=2$.

$\Delta J=0$.

@ $\Delta J=1$.

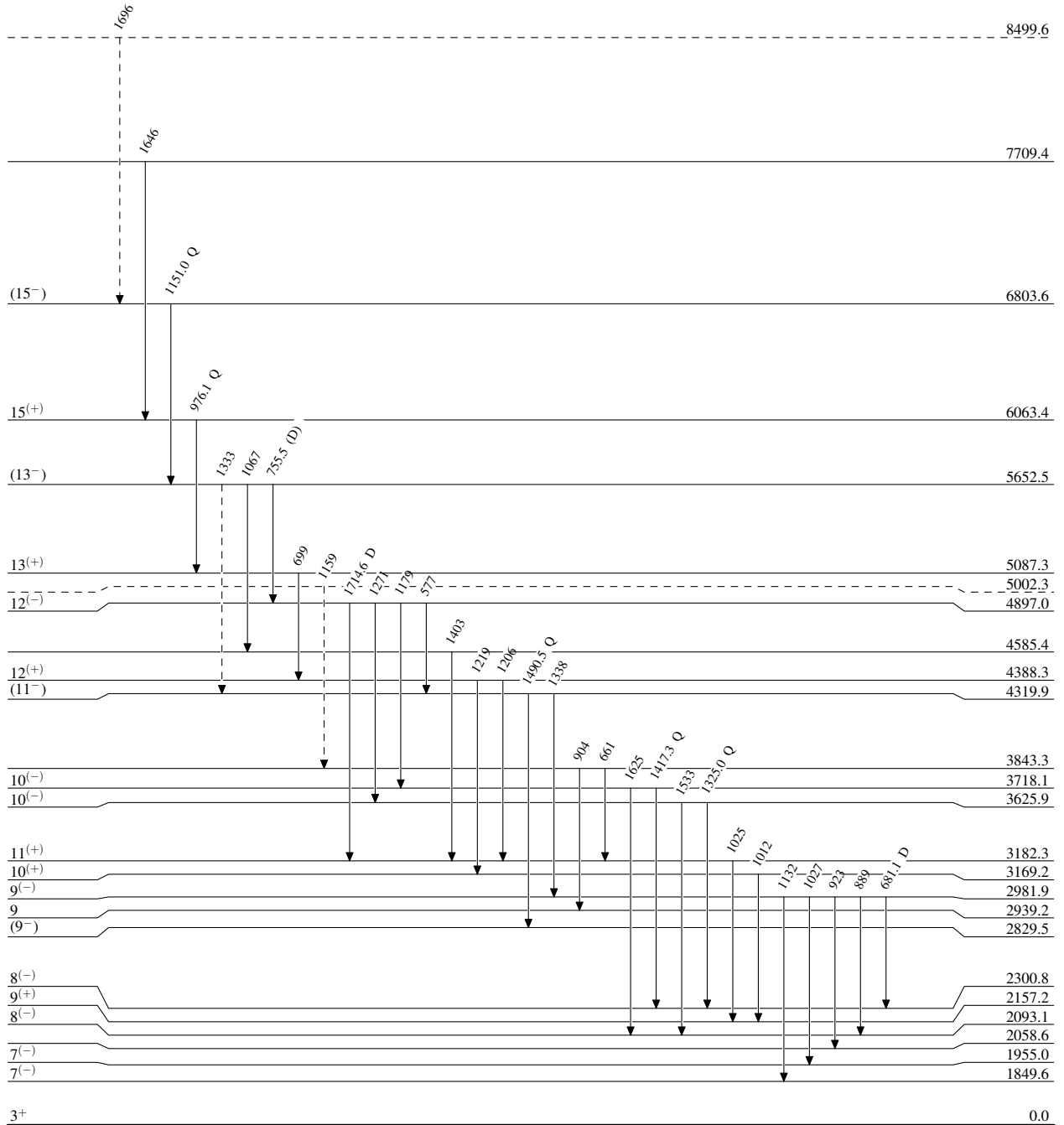
& Placement of transition in the level scheme is uncertain.

$^{40}\text{Ca}(^{32}\text{S},3\text{pn}\gamma)$ 2005St08

Legend

Level Scheme

-----► γ Decay (Uncertain)

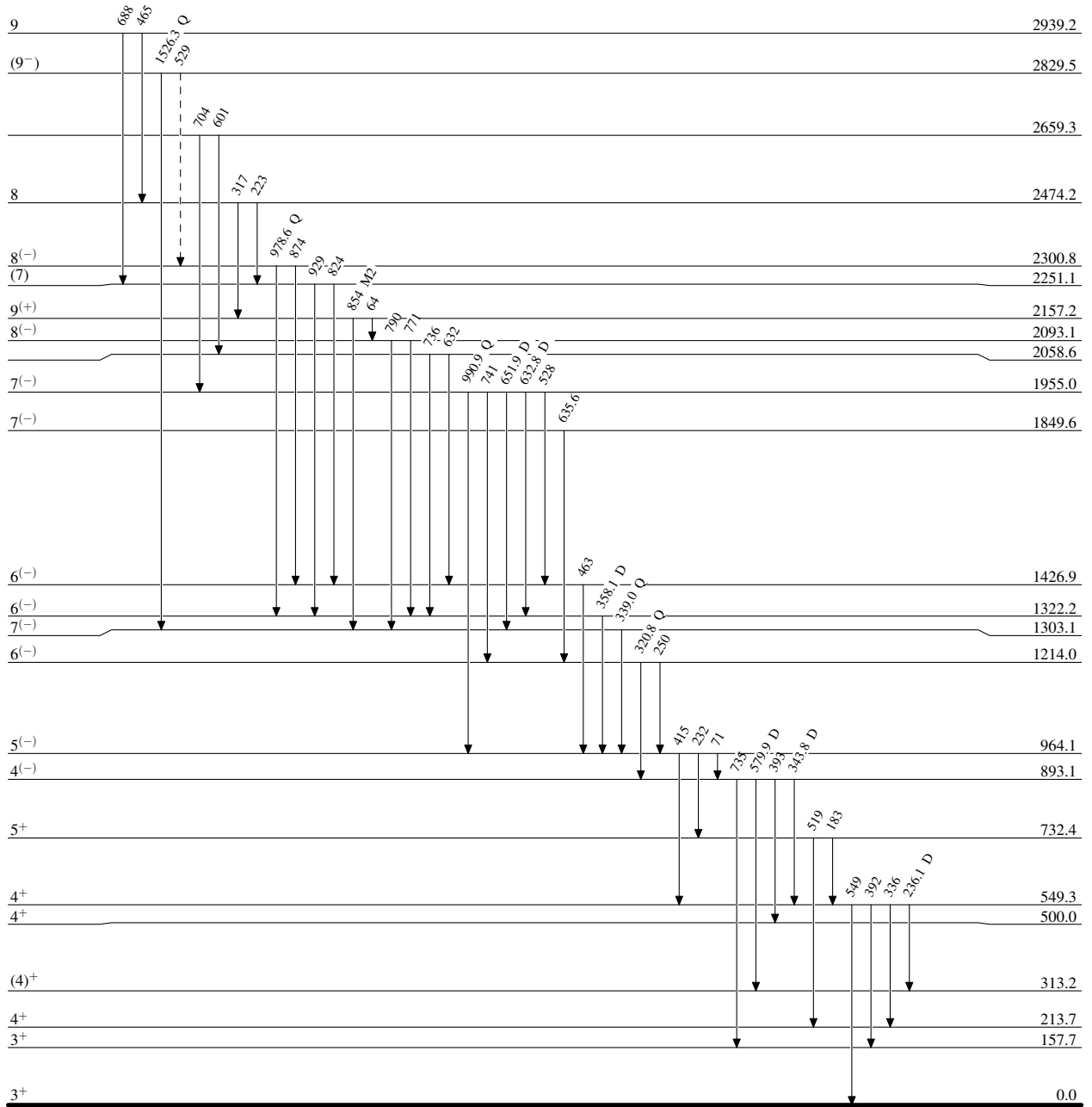


$^{68}_{33}\text{As}_{35}$

$^{40}\text{Ca}(^{32}\text{S},3\text{pn}\gamma)$ 2005St08

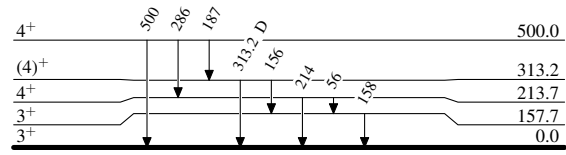
Legend

Level Scheme (continued)

-----▶ γ Decay (Uncertain) $^{68}_{33}\text{As}_{35}$

${}^{40}\text{Ca}({}^{32}\text{S}, 3\text{pn}\gamma)$ 2005St08

Level Scheme (continued)

 ${}^{68}_{33}\text{As}_{35}$