^{25}Na(d,pγ) 2004Sc43,2015Ca03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia and A. M. Hurst	NDS 134, 1 (2016)	1-Feb-2016

2004Sc43: Inverse kinematics reaction: A post-accelerated ^{25}Na beam provided by the REX-ISOLDE facility at CERN was delivered to a 10−μm thick deuterated polyethylene target with a beam energy of 2.2 MeV/nucleon and an intensity of about 1×10^{6} s^{-1}. Recoiling nuclei were detected in a segmented 24×4 annular and 16×4 radial Cd-type charged-particle detector telescope comprising an≈500−μm thick ΔE followed by an ≈ 500−μm thick E detector and covers a laboratory range from 15° to 50°. Coincident γ rays were measured using the MINIBALL array of 24 *6*-fold segmented, individually encapsulated, HPGe detectors arranged in 8 triple-cluster cryostats. Measured Eγ, γ(ions) coincidence. Preliminary report as stated in 2004Sc43.

2015Ca03: Inverse kinematics reaction: A 5-MeV/nucleon ^{25}Na beam was provided by ISAC2 at TRIUMF to impinge a 0.5-mg/cm^2 CD_2 target with an intensity of 3×10^{7} pps. Recoiling nuclei were detected in the silicon array SHARC in coincidence with deexcitation γ rays recorded in the HPGe clover array TIGRESS. Deduced levels, Eγ, J^π, measured angular distributions and extracted differential cross sections. Results compared with shell model calculations and previous work. See also 2012WiZW, 2012Wi13.

^{26}Na Levels

E(level)†	J$^\pi$‡	L@	S#	Comments
0	3$^+$			
81.8 *8*	1$^+$			
232.1 *6*	2$^+$	0	0.144	
405.8 *5*	2$^+$	0	0.337	
1507.0 *9*	1$^+$			
1807.6 *6*	3$^+$	2	0.216	
1996.1 *8*	4$^+$			E(level),J$^\pi$: only reported in 2015Ca03.
2118.2 *8*	5$^+$	2	0.216	J$^\pi$: reported as 4$^+$ in 2012WiZW.
2192.5 *8*	2$^+$			
2225.3 *7*	4$^+$	2	0.432	
2422.0 *8*	2$^+$			
2852.8 *7*	2$^-$			
3133.6 *8*	3$^-$	1	0.0983	
3509.3 *8*	4$^-$	1	0.540	
4089.7 *12*	2$^-$			E(level),J$^\pi$: only reported in 2015Ca03.
4303.3 *8*	(5$^-$)			
4915.3 *9*	(6$^-$)			
5012.8 *12*	(3$^-$,4$^-$)			

† From least-squares fit (by evaluators) to Eγ data yielding a reduced χ^2 of≈1. An uncertainty of 1 keV is assumed for each Eγ.
‡ Assignments in 2015Ca03 and 2012WiZW, based on excitation energy, angular momentum transfer, spectroscopic factor, comparison with shell-model calculations, and measured γ-ray branching ratios.
# Corrected for forward focusing of emitted γ rays. Extracted from measured and calculated differential cross sections in 2012WiZW.
@ Deduced from measured differential cross sections and theoretical angular distributions in 2012WiZW.

γ(^{26}Na)

Eγ†	Iγ†	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.@
151	42.9 *14*	232.1	2$^+$	81.8	1$^+$	
174	2.4 *3*	405.8	2$^+$	232.1	2$^+$	
232‡	57.1 *18*	232.1	2$^+$	0	3$^+$	M1
323	12.4 *5*	405.8	2$^+$	81.8	1$^+$	

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^{25}Na(d,pγ) 2004Sc43,2015Ca03 (continued)

$\gamma(^{26}Na)$ (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. @	Comments
405‡	85.2 *16*	405.8	2^+	0	3^+	M1	
418‡	5.8 *5*	2225.3	4^+	1807.6	3^+		
612	49.4 *28*	4915.3	(6^-)	4303.3	(5^-)	[M1]	
794	46.9 *32*	4303.3	(5^-)	3509.3	4^-		
1102	<10	1507.0	1^+	405.8	2^+		
1274	≈100	1507.0	1^+	232.1	2^+		
1402‡	6.6 *14*	1807.6	3^+	405.8	2^+		
1406	19.2 *16*	4915.3	(6^-)	3509.3	4^-		
1577‡	18.3 *26*	1807.6	3^+	232.1	2^+		
1764‡	≈50#	1996.1	4^+	232.1	2^+		
1786	<20	2192.5	2^+	405.8	2^+		
1806	75.1 *45*	1807.6	3^+	0	3^+		
1996‡	≈50#	1996.1	4^+	0	3^+		
2015‡	52 *18*	2422.0	2^+	405.8	2^+		
2078	32.7 *25*	4303.3	(5^-)	2225.3	4^+		
2118	100	2118.2	5^+	0	3^+		
2185	20.4 *19*	4303.3	(5^-)	2118.2	5^+		
2193	≈100	2192.5	2^+	0	3^+		
2225	94.2 *39*	2225.3	4^+	0	3^+		
2282‡	100#	4089.7	2^-	1807.6	3^+	[E1]	Mult.: based on systematics in this mass region (2015Ca03).
2423‡	48 *16*	2422.0	2^+	0	3^+		
2620	33.5 *30*	2852.8	2^-	232.1	2^+		
2727	33.6 *40*	3133.6	3^-	405.8	2^+		
2771	41.5 *33*	2852.8	2^-	81.8	1^+		
2797	31.3 *21*	4915.3	(6^-)	2118.2	5^+		
2853	25.0 *25*	2852.8	2^-	0	3^+		
3134	66.4 *46*	3133.6	3^-	0	3^+		
3205	100	5012.8	$(3^-,4^-)$	1807.6	3^+		
3509	100	3509.3	4^-	0	3^+		

† Measured in 2012WiZW except where noted.
‡ Taken from 2015Ca03.
# Taken from 2012WiZW.
@ Assignment in 2015Ca03, based on measured angular distributions.

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Level Scheme

Intensities: Relative I_γ