

²⁷Ne β⁻ decay 2006Tr02

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 112, 1875 (2011)	30-Nov-2010

Parent: ²⁷Ne: E=0.0; J^π=(3/2⁺); T_{1/2}=31.5 ms 13; Q(β⁻)=12.59×10³ 11; %β⁻ decay=100.0

²⁷Ne-%β⁻ decay: %β-n=3 1 (2006Tr02).

²⁷Ne isotope was produced from fragmentation of ⁴⁸Ca beam on a Be target, E=140 MeV/u, at NSCL; Fragments were separated by the A1900 fragment separator and identified by energy loss in ΔE-E detector, and by time of flight; Detector: double sided Si microstrip detector (DSSD), an array of 12 HPGe detectors, β⁻ counting system; Measured E_γ, E_β, I_γ, I_β, β⁻γγ coin.

²⁷Na Levels

E(level) [†]	J ^π [‡]	E(level) [†]	E(level) [†]	E(level) [†]
0	5/2 ⁺	2192.1 12	3019.2 8	3685.3 10
63.0 7	(3/2 ⁺)	2288.1 12	3508.2 10	3781.3 10
1728.1 8	(1/2 ⁺)	2799.2 8	3582.3 10	4355.2 16

[†] From a least-squares adjustment to E_γ. ΔE=1 keV is assumed by the evaluator.

[‡] From Adopted Levels.

β⁻ radiations

E(decay)	E(level)	I _{β⁻} ^{†‡}	Log ft	Comments
(8.23×10 ³ 11)	4355.2	>3.0	<4.8	av E _β =3880 55 I _{β⁻} : >3.0 5 in figure 13 of 2006Tr02.
(8.81×10 ³ 11)	3781.3	3.0 6	4.96 10	av E _β =4163 55
(8.90×10 ³ 11)	3685.3	2.6 6	5.04 11	av E _β =4211 55
(9.01×10 ³ 11)	3582.3	1.3 4	5.36 14	av E _β =4262 55
(9.08×10 ³ 11)	3508.2	1.6 4	5.29 12	av E _β =4298 55
(9.57×10 ³ 11)	3019.2	11.0 10	4.56 5	av E _β =4540 55
(9.79×10 ³ 11)	2799.2	8.9 9	4.70 6	av E _β =4649 55
(1.030×10 ⁴ 11)	2288.1	1.1 6	5.71 24	av E _β =4902 55
(1.040×10 ⁴ 11)	2192.1	0.9 6	5.8 3	av E _β =4949 55
(1.086×10 ⁴ 11)	1728.1	3.4 5	5.33 7	av E _β =5179 55
(1.253×10 ⁴ 11)	63.0	4.2 13	5.54 14	av E _β =6002 55
(1.259×10 ⁴ 11)	0	59.5 30	4.40 4	av E _β =6034 55

[†] From γ-ray intensity balance to each level and estimated neutron emission probability of 3(1)%. (2006Tr02).

[‡] Absolute intensity per 100 decays.

γ(²⁷Na)

I_γ normalization: Measured absolute γ-ray intensities (2006Tr02).

E _γ	I _γ ^{†‡}	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	Comments
63	21.1 7	63.0	(3/2 ⁺)	0	5/2 ⁺	(M1+E2)	Mult.: From Adopted Gammas.
1665	3.0 5	1728.1	(1/2 ⁺)	63.0	(3/2 ⁺)		
1728	0.43 17	1728.1	(1/2 ⁺)	0	5/2 ⁺		
2067	3.2 5	4355.2		2288.1			
2129	0.98 28	2192.1		63.0	(3/2 ⁺)		

Continued on next page (footnotes at end of table)

${}^{27}\text{Ne} \beta^-$ decay 2006Tr02 (continued) $\gamma({}^{27}\text{Na})$ (continued)

E_γ	$I_\gamma^{\dagger\ddagger}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$I_\gamma^{\dagger\ddagger}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
2225	4.3 6	2288.1		63.0	(3/2 ⁺)	3508	1.6 4	3508.2		0	5/2 ⁺
2736	5.9 8	2799.2		63.0	(3/2 ⁺)	3582	1.3 4	3582.3		0	5/2 ⁺
2799	3.0 5	2799.2		0	5/2 ⁺	3685	2.6 6	3685.3		0	5/2 ⁺
2956	2.7 5	3019.2		63.0	(3/2 ⁺)	3781	3.2 6	3781.3		0	5/2 ⁺
3019	8.4 9	3019.2		0	5/2 ⁺						

[†] Based on a private communication (e-mail) of the XUNDL data compilation group with V. Tripathi, May 9, 2006.

[‡] Absolute intensity per 100 decays.

$^{27}\text{Ne} \beta^-$ decay 2006Tr02

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

Legend

- $I_\gamma < 2\% \times I_\gamma^{\max}$
- $I_\gamma < 10\% \times I_\gamma^{\max}$
- $I_\gamma > 10\% \times I_\gamma^{\max}$
- Coincidence

