

Coulomb excitation [1977Sc36](#),[1996Tu02](#),[1956Te33](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia [#] , A. Chakraborty ^{##}		NDS 171,1 (2021)	1-Jun-2020

[1977Sc36](#): ${}^{23}\text{Na}({}^{32}\text{S}, {}^{32}\text{S}')$, E=47-51 MeV, natural NaCl target; ${}^{23}\text{Na}({}^{35}\text{Cl}, {}^{35}\text{Cl}')$, E=53-56 MeV, Na (100%) target; Measured $\sigma(E\gamma)$, mean lifetime by Doppler-shift attenuation (DSA) method, deduced B(E2).

[1996Tu02](#): ${}^{12}\text{C}({}^{23}\text{Na}, {}^{23}\text{Na}')$, E=20,23 MeV; Measured $\sigma(\theta)$, deduced B(E2).

[1956Te33](#): ${}^{23}\text{Na}(\alpha, \alpha')$, E=2.5 MeV; Measured $\gamma(\theta)$; Deduced 440 γ multipolarity and spin-parity of 440-keV level.

 ${}^{23}\text{Na}$ Levels

E(level) [†]	J^π [†]	$T_{1/2}$	Comments
0.0	$3/2^+$		
440.2 4	$5/2^+$	1.17 ps 15	B(E2) \uparrow =0.01515 16 (1996Tu02) B(E2) \uparrow =0.0157 12 (1977Sc36) J^π : From 1956Te33 , based on $\gamma(\theta)$ measurements. $T_{1/2}$: From mean lifetime τ =1.69 ps 22 (DSA - 1977Sc36). Others: 1.42 ps 22 and 1.37 ps 24, using B(E2) \uparrow =0.01515 16 (1996Tu02) and 0.0157 12 (1977Sc36), respectively, and adopted γ -ray properties.
2076.2 4	$7/2^+$	35 fs 5	B(E2) \uparrow =0.0073 10 (1996Tu02) $T_{1/2}$: Using B(E2) \uparrow =0.0073 10 (1996Tu02) and adopted γ -ray properties. Other: 83 fs 42 from τ =120 fs 60 (DSA - 1977Sc36).

[†] From Adopted Levels, except where otherwise noted.

 $\gamma({}^{23}\text{Na})$

E_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
440.5 6	440.2	$5/2^+$	0.0	$3/2^+$
1636.6 8	2076.2	$7/2^+$	440.2	$5/2^+$
2076.7 8	2076.2	$7/2^+$	0.0	$3/2^+$

[†] From Adopted Gammas.

Coulomb excitation 1977Sc36,1996Tu02,1956Te33Level Scheme