

$^{17}\text{O}(\alpha,n),(\alpha,\gamma)$ 2011Be17,2013Be11

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	R. B. Firestone	NDS 127, 1 (2015)	15-Jan-2015

$E(\alpha)$ =800-2300 keV provided by the 4 MV KN accelerator at the University of Notre Dame Nuclear Science Laboratory.

Target= Ta_2O_5 (90.1%). Measured $E\gamma$, $I\gamma$, E_n , neutron yield, $(n)\gamma$ -coin, $\sigma(E)$ using a HPGe detector and 20 ^3He counters.

Deduced levels, J, π , S-factors, reaction rate, single-particle widths, resonance strength, L. R-matrix fit. Astrophysical implications discussed.

 ^{21}Ne Levels

E(level)	J π	Comments
0	3/2 ⁺	
350	5/2 ⁺	
1746		
2866		
6033		
8069 2	3/2 ⁺	$\Gamma(\alpha)$ =0.0462 eV for l=2, s=5/2; $\Gamma(n0)$ =3.0 keV for l=2, s=1/2.
8146 2	3/2 ⁺	$\Gamma(\alpha)$ =0.0547 eV for l=2, s=5/2; $\Gamma(n0)$ =0.974 keV for l=2, s=1/2.
8160 2	5/2 ⁺	$\Gamma(\alpha)$ =0.0160 eV for l=0, s=5/2; $\Gamma(\alpha)$ =0.00045 eV for l=2, s=5/2; $\Gamma(n0)$ =23.0 keV for l=2, s=1/2. E(level): From $E\alpha(\text{lab})$ =1002 2 resonance. Resonance strength $\omega\gamma$ =7.6 meV 9.
8189 2	3/2 ⁻	$\Gamma(\alpha)$ =0.884 eV for l=1, s=5/2; $\Gamma(n0)$ =3.32 keV for l=1, s=1/2.
8264 2	5/2 ⁻	$\Gamma(\alpha)$ =0.0544 eV for l=1, s=5/2; $\Gamma(n0)$ =3.3 keV for l=3, s=1/2.
8292 2	3/2 ⁻	$\Gamma(\alpha)$ =0.559 eV for l=1, s=5/2; $\Gamma(n0)$ =7.54 keV for l=1, s=1/2.
8359 2	3/2 ⁺	$\Gamma(\alpha)$ =0.0583 eV for l=2, s=5/2; $\Gamma(n0)$ =7.99 keV for l=2, s=1/2.
8438 2	3/2 ⁻	$\Gamma(\alpha)$ =0.563 eV for l=1, s=5/2; $\Gamma(n1)$ =1.19 keV for l=1, s=3/2; $\Gamma(n1)$ =140 eV for l=1, s=5/2; $\Gamma(n0)$ =2.34 keV for l=1, s=1/2.
8470 2	3/2 ⁻	$\Gamma(\alpha)$ =0.363 eV for l=1, s=5/2; $\Gamma(n1)$ =320 eV for l=1, s=3/2; $\Gamma(n1)$ =37.7 eV for l=1, s=5/2; $\Gamma(n0)$ =781 eV for l=1, s=1/2. E(level): From $E\alpha(\text{lab})$ =1386 2 resonance. Resonance strength $\omega\gamma$ =1.2 meV 2.
8516 2	5/2 ⁻	$\Gamma(\alpha)$ =21.3 eV for l=1, s=5/2; $\Gamma(n1)$ =1.07 keV for l=1, s=3/2; $\Gamma(n1)$ =1.22 keV for l=1, s=5/2; $\Gamma(n0)$ =1.86 keV for l=3, s=1/2.
8658 2	9/2 ⁻	$\Gamma(\alpha)$ =0.625 eV for l=3, s=5/2; $\Gamma(n1)$ =222 eV for l=3, s=3/2; and for l=3, s=5/2; $\Gamma(n0)$ =109 eV for l=5, s=1/2. E(level): From $E\alpha(\text{lab})$ =1002 2 resonance. Resonance strength $\omega\gamma$ =136 meV 17.
8665 2	3/2 ⁻	$\Gamma(\alpha)$ =76.1 eV for l=1, s=5/2; $\Gamma(n0)$ =62.5 keV for l=1, s=1/2.
8774 2	5/2 ⁺	$\Gamma(\alpha)$ =217 eV for l=0, s=5/2; $\Gamma(\alpha)$ =32.4 eV for l=2, s=5/2; $\Gamma(n1)$ =448 eV for l=2, s=3/2; $\Gamma(n1)$ =10.3 keV for l=0, s=5/2; $\Gamma(n1)$ =9.35 eV for l=2, s=5/2; $\Gamma(n0)$ =18.7 keV for l=2, s=1/2.
8791 2	1/2 ⁺	$\Gamma(\alpha)$ =627 eV for l=2, s=5/2; $\Gamma(n0)$ =342 eV for l=0, s=1/2.
8839 2	3/2 ⁺	$\Gamma(\alpha)$ =131 eV for l=2, s=5/2; $\Gamma(n1)$ =786 eV for l=0, s=3/2; $\Gamma(n1)$ =84.1 eV for l=2, s=3/2; $\Gamma(n1)$ =2.18 keV for l=2, s=5/2; $\Gamma(n0)$ =5.13 keV for l=2, s=1/2.
8899 2	3/2 ⁻	$\Gamma(\alpha)$ =531 eV for l=1, s=5/2; $\Gamma(n0)$ =75.2 keV for l=1, s=1/2.
8929 2	5/2 ⁺	$\Gamma(\alpha)$ =31.5 eV for l=0, s=5/2; $\Gamma(\alpha)$ =768 eV for l=2, s=5/2; $\Gamma(n1)$ =1.03 eV for l=2, s=3/2; $\Gamma(n1)$ =4.43 keV for l=0, s=5/2; $\Gamma(n1)$ =0.0249 eV for l=2, s=5/2; $\Gamma(n0)$ =9.34 keV for l=2, s=1/2.
8981 2	3/2 ⁺	$\Gamma(\alpha)$ =403 eV for l=2, s=5/2; $\Gamma(n1)$ =19.4 eV for l=0, s=3/2; $\Gamma(n1)$ =0.00177 eV for l=2, s=3/2; $\Gamma(n1)$ =1.06 keV for l=2, s=5/2; $\Gamma(n0)$ =881 eV for l=2, s=1/2.
9099 2	5/2 ⁺	$\Gamma(\alpha)$ =16.8 keV for l=0, s=5/2; $\Gamma(\alpha)$ =1.1 keV for l=2, s=5/2; $\Gamma(n1)$ =37.7 eV for l=2, s=3/2; $\Gamma(n1)$ =16.7 keV for l=0, s=5/2; $\Gamma(n1)$ =0.816 eV for l=2, s=5/2; $\Gamma(n0)$ =55.0 keV for l=2, s=1/2.
9203 2	3/2 ⁻	$\Gamma(\alpha)$ =1.83 keV for l=1, s=5/2; $\Gamma(n1)$ =758 eV for l=1, s=3/2; $\Gamma(n1)$ =85.6 eV for l=1, s=5/2; $\Gamma(n0)$ =1.03 keV for l=1, s=1/2.
9232 2	5/2 ⁺	$\Gamma(\alpha)$ =4.69 keV for l=0, s=5/2; $\Gamma(\alpha)$ =2.92 keV for l=2, s=5/2; $\Gamma(n1)$ =20.7 eV for l=2, s=3/2; $\Gamma(n1)$ =20.8 keV for l=0, s=5/2; $\Gamma(n1)$ =0.444 eV for l=2, s=5/2; $\Gamma(n0)$ =110 keV for l=2, s=1/2.

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E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
350	350	$5/2^+$	0	$3/2^+$
1120	2866		1746	
1396	1746		350	$5/2^+$
2516	2866		350	$5/2^+$
3167	6033		2866	
4287	6033		1746	

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