

$^1\text{H}(^{21}\text{Na},\text{P})$: res [2014Zh05,2005Ru01](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 127, 69(2015)	1-Apr-2015

Other references: [2013He16](#), [2009He12](#), [2008He04](#), [2005Ru15](#), [2002Ru03](#).

$J^\pi(^{21}\text{Na})=3/2^+$.

[2014Zh05](#): ^{21}Na secondary beam, $E=89.4$ MeV, bombarded a $(\text{CH}_2)_n$ target of thickness 8.8 mg/cm². Secondary beam of ^{21}Na was produced from $^2\text{H}(^{20}\text{Ne},n)^{21}\text{Na}$ reaction, $E=8.2$ MeV/nucleon. Recoiled protons were detected using three sets of ΔE -E Si telescopes. Measured proton spectra, angular distributions. FWHM ≈ 30 keV. R-matrix analysis. Deduced resonances, J, π , L, thermonuclear reaction rates for $^{18}\text{Ne}(\alpha,p)^{21}\text{Na}$.

[2005Ru01,2005Ru15](#): ^{21}Na secondary beam, $E=0.58$ - 1.4 MeV. TRIUMF-ISAC, measured recoil proton spectra using silicon detector array, deduced resonance energy, Γ_{tot} , Γ_p . Also [2002Ru03](#) data were revised through a superior analysis ([2005Ru01](#)).

[2014Zh05](#), [2013He16](#), [2009He12](#), and [2008He04](#) – all from the same research group. Results in [2014Zh05](#) supersede those in [2013He16](#) and represent better statistics compared with those in [2009He12](#) and [2008He04](#).

 ^{22}Mg Levels

E(level) [†]	J^π [#]	Γ_{tot} ^a	L ^b	Comments
6329.1 [‡] 24	1 ⁺	13.6 keV 14	0	E(level): Other value: 6333 (2014Zh05). Resonance energy 824.8 keV 24 (2005Ru01). $\Gamma_p=13.6$ keV 14 (2005Ru01).
6587 [‡] 10	1 ⁻	12.8 keV 15	1	E(level): Other value: 6591 (2014Zh05). Resonance energy 1083 keV 10 (2005Ru01). $\Gamma_p=11.9$ keV 14 and $\Gamma_{p'}=0.94$ keV 11 (2005Ru01).
6611 [‡] 11	2 ⁺ @	17.9 keV 16	0	E(level): Other value: 6615 (2014Zh05). Resonance energy 1107 keV 11 (2005Ru01). $\Gamma_p=17.6$ keV 15 and $\Gamma_{p'}=0.3$ keV 1 (2005Ru01); $\Gamma_p=23$ keV 7 (2009He12).
6792 [‡] 17	2 ⁻	105 keV 33	1	E(level): Other value: 6796 (2014Zh05). From resonance energy 1288 keV 17 (2005Ru01). $\Gamma_p=94$ keV 32 and $\Gamma_{p'}=11.1$ keV 8 (2005Ru01); $\Gamma_p=64$ keV 20 (2009He12).
6885	(1 ⁻)		3	
7270	(1 ⁻)		1	$\Gamma_p=17$ keV 7 (2009He12).
7339	(2 ⁺)		2	
7369	(3 ⁻)		3	
7585	(2 ⁺)		0	E(level): From Table II (2014Zh05). Appears to be average of 7580 (2008He04) and 7590 (2009He12). In Fig. 7 (2014Zh05) 7580 is presented. $\Gamma_p=23$ keV 7 (2009He12).
7654	(1 ⁻)		1	
7802	(2 ⁻)&		1	E(level): 7782 in Fig. 7 (2014Zh05), source unknown. $\Gamma_p=27$ keV (roughly estimated in 2009He12).
7920	(2 ⁺)		0	J^π : 3 ⁻ in Table II (2014Zh05) probably a typo.
8005	(3 ⁻)@		3	$\Gamma_p=20$ keV (roughly estimated in 2009He12).
8190	(2 ⁺)		2	$\Gamma_p=33$ keV (roughly estimated in 2009He12).
8353	(1 ⁺)		2	
8527	(3 ⁻)		1	$\Gamma_p=60$ keV 20 (2009He12).
8578	(4 ⁺)		2	
8677	(2 ⁺)		2	
8727	(2 ⁺)		0	
8827	(1 ⁻)		1	
8922	(2 ⁺)		2	
9050	(1 ⁻)		1	
9158	(4 ⁺)		2	

Continued on next page (footnotes at end of table)

$^1\text{H}(^{21}\text{Na,P}); \text{res}$ [2014Zh05](#), [2005Ru01](#) (continued)

^{22}Mg Levels (continued)

[†] From [2014Zh05](#), except otherwise noted. Uncertainty not given in [2014Zh05](#), probably ≈ 10 keV.

[‡] Deduced by evaluator using $\text{Sp}(^{22}\text{Mg})=5504.3 \pm 4$ ([2012Wa38](#)) and resonance energy listed in comments.

From R-matrix analysis in [2014Zh05](#).

@ Natural parity ([2009He12](#)).

& Unnatural parity ([2009He12](#)).

^a From [2005Ru01](#). Γ_p , $\Gamma_{p'}$ are listed in the comment section. These data were estimated from R-matrix fits.

^b From [2014Zh05](#), used in the R-matrix analysis.