^{26}Mg(α,n),(α,γ),(α,α):res 1972Ru02,1962Ba36,1961Cs02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

Others: 1968Me04 (α,γ), 1978Ze02 (^{14}N,^{10}B), 1977NaZI report nine levels from ^{26}Mg(α,α') studies.

1972Ru02: ^{26}Mg target (99.7% enriched), (α,n), E=2.5-4.3 MeV; measured σ(E); (α,γ), E=2.5-4.3 MeV; measured σ(E;θ); (α,α), E=2.5-4.3 MeV; measured σ(E;θ), four Si surface-barrier detectors in a 35.5 cm diameter scattering chamber, two NaI(Tl) detectors; the neutron yield was measured with a BF3 detector at 0° from the beam direction; deduced levels, spin, parity, Γ.

1962Ba36: (α,n), 99% enriched ^{26}MgO target of various thicknesses, E_α=4.56 and 5.01 MeV; NaI(Tl) crystal, measured γ (not reported); deduced excited levels.

1961Cs02: (α,γ): Electromagnetically separated ^{26}MgO target, E_α=4.56 and 5.01 MeV; NaI(Tl) crystal, measured γ (not reported); deduced excited levels.

1976Ma12: (^{12}C,^{8}Be) – E=50-65 MeV; measured σ(E, E(^{8}Be), θ); deduced levels.

^{30}Si Levels

E(level)[†]	J$^\pi$	Γ[&]	Γ_{obs} (keV)[a]	Comments
5.6×10^3[‡]				
7.3×10^3[‡]				
8.6×10^3[‡]				E(level): from listed 8.4 to 8.8 in Fig. 10. (1976Ma12), not referenced in "XREF".
9.6×10^3[‡]				
13022 *5*			<9	E_α(Lab)=2744 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 7 keV *2* (1972Ru02).
13077 *5*		>4 keV	<10	E_α(Lab)=2808 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 8 keV *2* (1972Ru02).
13182 *5*		>4 keV	<10	E_α(Lab)=2929 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 8 keV *2* (1972Ru02).
13220 *5*		>18 keV	<22	E_α(Lab)=2972 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 19 keV *3* (1972Ru02).
13234 *5*		>12 keV	<17	E_α(Lab)=2989 keV *5* (1972Ru02 – (α,n)). Γ_{obs} < 10 keV (1972Ru02 – from 14 *3*). Γ_{obs} (keV): From 14 keV *3* (1972Ru02).
13307 *5*		>52 keV	<58	E_α(Lab)=3073 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 53 keV *5* (1972Ru02).
13403 *5*		>4 keV	<10	E_α(Lab)=3184 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 8 keV *2* (1972Ru02).
13471 *5*		>13 keV	<18	E_α(Lab)=3262 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 15 keV *3* (1972Ru02).
13489 *5*	1$^-$[@]	>17 keV	<21	E_α(Lab)=3283 keV *5* (1972Ru02 – (α,n), other: 3285 keV (α,α)). Γ_{obs} (keV): from 18 keV *3* (1972Ru02).
13588 *5*		>12 keV	<17	E_α(Lab)=3397 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 14 keV *3* (1972Ru02).
13604 *5*		>10 keV	<15	E_α(Lab)=3415 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 12 keV *3* (1972Ru02).
13674 *5*		>20 keV	<27	E_α(Lab)=3496 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 22 keV *5* (1972Ru02).
13705 *5*		>20 keV	<27	E_α(Lab)=3532 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 22 keV *5* (1972Ru02).
13725 *5*		>20 keV	<27	E_α(Lab)=3555 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 22 keV *5* (1972Ru02).
13747 *5*		>13 keV	<18	E_α(Lab)=3580 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 15 keV *3* (1972Ru02).
13773 *5*	0$^+$[@]	>19 keV	<23	E_α(Lab)=3610 keV *5* (1972Ru02 – (α,n), other: 3612 keV (α,α)).

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^{26}Mg(α,n),(α,γ),(α,α):res 1972Ru02,1962Ba36,1961Cs02 (continued)

^{30}Si Levels (continued)

E(level)[†]	Jπ	Γ[&]	Γ_{obs} (keV)[a]	Comments
				Γ_{obs} (keV): from 20 keV *3* (1972Ru02).
13796 *5*		>13 keV	<18	E_α(Lab)=3637 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 15 keV *3* (1972Ru02).
13858 *5*	1$^-$[@]	>17 keV	<21	E_α(Lab)=3708 keV *5* (1972Ru02 – (α,n), other: 3709 keV (α,γ), (α,α)). $\Gamma_{\gamma 0}$=0.4 eV (1972Ru02 – assuming Γ_p=0). Γ_{obs} (keV): from 18 keV *3* (1972Ru02).
13888 *5*	(1$^-$)[@]	>14 keV	<19	E_α(Lab)=3743 keV *5* (1972Ru02 – (α,n), other: 3750 keV (α,α)). Γ_{obs} (keV): from 16 keV *3* (1972Ru02).
13938 *5*		>4 keV	<10	E_α(Lab)=3801 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 8 keV *2* (1972Ru02).
13957 *5*		>6 keV	<11	E_α(Lab)=3823 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 9 keV *2* (1972Ru02).
13986 *5*		>20 keV	<26	E_α(Lab)=3856 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 22 keV *4* (1972Ru02).
14007 *5*	0$^+$[@]	>13 keV	<18	E_α(Lab)=3880 keV *5* (1972Ru02 – (α,n), (α,α)). Γ_{obs} (keV): from 15 keV *3* (1972Ru02).
14094 *5*	1$^-$[@]	>18 keV	<22	E_α(Lab)=3981 keV *5* (1972Ru02 – (α,n),(α,γ),(α,α)). $\Gamma_{\gamma 0}$=6.1 eV (1972Ru02 – assuming Γ_p=0). Γ_{obs} (keV): from 19 keV *3* (1972Ru02).
14147 *5*		>13 keV	<18	E_α(Lab)=4042 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 15 keV *3* (1972Ru02).
14177 *5*		>20 keV	<24	E_α(Lab)=4076 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): from 21 keV *3* (1972Ru02).
14190	0$^+$[@]			E_α(Lab)=4091 keV (1972Ru02 – (α,α)).
14237 *5*		>7 keV	<12	E_α(Lab)=4146 keV *5* (1972Ru02 – (α,n)). Γ_{obs} (keV): From 10 keV *2* (1972Ru02).
14253 *5*	(2$^+$)[@]	>11 keV	<15	E_α(Lab)=4164 keV *5* (1972Ru02 – (α,n), other: 4160 keV (α,α)). Γ_{obs} (keV): from 13 keV *2* (1972Ru02).
14311 *5*	1$^-$[@]	>19 keV	<23	E_α(Lab)=4231 keV *5* (1972Ru02 – (α,n),(α,γ),(α,α)). $\Gamma_{\gamma 0}$=8.5 eV (1972Ru02 – assuming Γ_p=0). Γ_{obs} (keV): from 20 keV *3* (1972Ru02).
14320[#]	0$^+$[#]			E(level): Other: 14320 (1977NaZI).
14376[#]	0$^+$[#]			
14596 *50*	0$^+$[#]			E_α(Lab)=(4.56 *5*) × 10^3 (1961Cs02, 1962Ba36). E(level): (14.59 *4*) × 10^3 in 1961Cs02 using the E_α(Lab) and Q(α)=10633 keV. 14597 keV in 1977NaZI.
14647[#]	2$^+$[#]			E(level): Other: 14627 (1977NaZI).
14675[#]	1$^-$[#]			
14718[#]	3$^-$[#]			
14874[#]	0$^+$[#]			E(level): Other: 14895 (1977NaZI).
14918[#]	3$^-$[#]			E(level): Other: 14917 (1977NaZI).
1.499×10^4 *3*				E_α(Lab)=(5.01 *30*) × 10^3 keV (1961Cs02, 1962Ba36). E(level): (14.98 *3*) × 10^3 in 1961Cs02 using the E_α(Lab) and Q(α)=10633 keV. Other: 14973 and 15008 (1977NaZI) both falls within the uncertainty, listed spin and parity as 2$^+$ and 0$^+$, respectively, no details are given.
15022[#]	4$^+$[#]			E(level): Other: 15069 (1977NaZI).

[†] Deduced by the evaluators using E_α(Lab), m(^{30}Si)=29.973770137 a.m.u. *23*, m(^{26}Mg)=25.98259297 a.m.u. *3*, and

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^{26}Mg(α,n),(α,γ),(α,α):res 1972Ru02,1962Ba36,1961Cs02 (continued)

^{30}Si Levels (continued)

Q(α)(^{30}Si)=10643.33 keV *4* (2021Wa16), except where otherwise noted.

‡ From 1976Ma12.

From 1977NaZI (^{26}Mg(α,α')). No details are given.

@ From 1972Ru02, based on angular distribution data for the ground state transitions in (α,γ) and $\alpha(\theta)$ measurements in (α,$\alpha\gamma$).

& Estimated value in 1972Ru02 based on Γ_{obs}.

a $\Gamma_{obs}=\Gamma_{observed}$ (1972Ru02). The reported Γ values are lower limits as those were calculated with the assumption that $\Gamma_{expt}=7$ keV. So the widths Γ_{obs} are the upper limits.