^{54}Fe(^{18}O,2npγ) 1978He13

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 207,1 (2026)	1-Apr-2023

Includes ^{55}Mn(^{16}O,2nγ),^{56}Fe(^{16}O,2npγ), and ^{58}Ni(^{16}O,p$\alpha\gamma$).

1978He13: Measurements were made with Ge(Li) detectors with 10-15% efficiency and energy resolution of 2.1-2.4 keV at 1.33 MeV.

^{54}Fe(^{18}O,2npγ) E=45, 50, 55 MeV; Eγ, Iγ and γ yields.

^{55}Mn(^{16}O,2nγ) E=46 MeV; Eγ and $\gamma\gamma$ coincidences.

^{56}Fe(^{16}O,2npγ) E=59 MeV; $T_{1/2}$ by recoil-distance method.

^{58}Ni(^{16}O,p$\alpha\gamma$) E=52.5 MeV; Eγ, $\gamma\gamma$ coincidences and $\gamma(\theta)$, E=58 MeV; $T_{1/2}$ by recoil-distance method, E=47 MeV; $\gamma\gamma$ coincidences.

^{69}As Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	Comments
0.0	5/2$^-$		
864.0 *10*	7/2$^-$		
1306.7 *10*	9/2$^+$	1.35 ns *4*	
2161.1 *10*	13/2$^+$	3.5 ps *6*	
2210.8 *11*	(11/2$^+$)		
3259.8 *10*	17/2$^+$	<6 ps	
3264.2 *11*	(15/2$^+$)		
4465.1 *11*	21/2$^+$		$T_{1/2}$: Authors report values 4.9 ps *9*, 4.7 ps *19* and 7.6 ps *28*.
5198.5 *11*	(25/2$^+$)	7.8 ps *11*	

[†] From a least-squares fit to Eγ data by the evaluator.

[‡] From Adopted Levels.

[#] From recoil distance method (1978He13).

γ(^{69}As)

E$_\gamma$[†]	I$_\gamma$[#]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
442.70 *11*	43 *2*	1306.7	9/2$^+$	864.0	7/2$^-$	D	I$_\gamma$: 41 *1* in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. A$_2$=−0.23 *3*, A$_4$=0 *3*.
733.4 *2*	33 *2*	5198.5	(25/2$^+$)	4465.1	21/2$^+$	Q	I$_\gamma$: 25 *1* in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. Mult.: ΔJ=2 from A$_2$=+0.32 *6*, A$_4$=−0.07 *8*. E$_\gamma$: Doublet.
854.36 *12*	63 *3*	2161.1	13/2$^+$	1306.7	9/2$^+$	Q	I$_\gamma$: 73 *1* in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. Mult.: ΔJ=2 from A$_2$=+0.27 *3*, A$_4$=−0.09 *3*.
863.98 *16*	79 *3*	864.0	7/2$^-$	0.0	5/2$^-$		E$_\gamma$: Doublet.
904.1 *5*	<20	2210.8	(11/2$^+$)	1306.7	9/2$^+$	D+Q	I$_\gamma$: <7 in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. E$_\gamma$: Doublet. A$_2$=−0.90 *6*.
1098.7 *2*	31 *3*	3259.8	17/2$^+$	2161.1	13/2$^+$	Q	I$_\gamma$: 50 *4* in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. Mult.: ΔJ=2 from A$_2$=+0.21 *5*, A$_4$=+0.05 *6*.
1103.1 *5*	<22	3264.2	(15/2$^+$)	2161.1	13/2$^+$		I$_\gamma$: <13 in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV.
1205.3 *2*	27 *2*	4465.1	21/2$^+$	3259.8	17/2$^+$		A$_2$=+0.59 *12*, A$_4$=−0.14 *12*.
1306.68 *13*	57 *3*	1306.7	9/2$^+$	0.0	5/2$^-$	Q	I$_\gamma$: 59 *1* in ^{58}Ni(^{16}O,p$\alpha\gamma$) at 52.5 MeV. Mult.: ΔJ=2 from A$_2$=+0.35 *4*, A$_4$=0 *4*. I$_\gamma$: From branching in adopted γ's, Iγ (1307γ) from the 1307 level is expected to be ≈ 27. The excess suggests the 2168 level, which decays via 1306γ, may be populated in this reaction.

Continued on next page (footnotes at end of table)

^{54}Fe(^{18}O,2npγ) 1978He13 (continued)

$\gamma(^{69}As)$ (continued)

† From 1978He13.
‡ From $\gamma(\theta)$; A_2 and A_4 from 1978He13 given in comments.
# From ^{54}Fe(^{18}O,2npγ) at E=50 MeV normalized to the sum of Iγ at 1307 and 443 keV and corrected for $\gamma(\theta)$ (1978He13).

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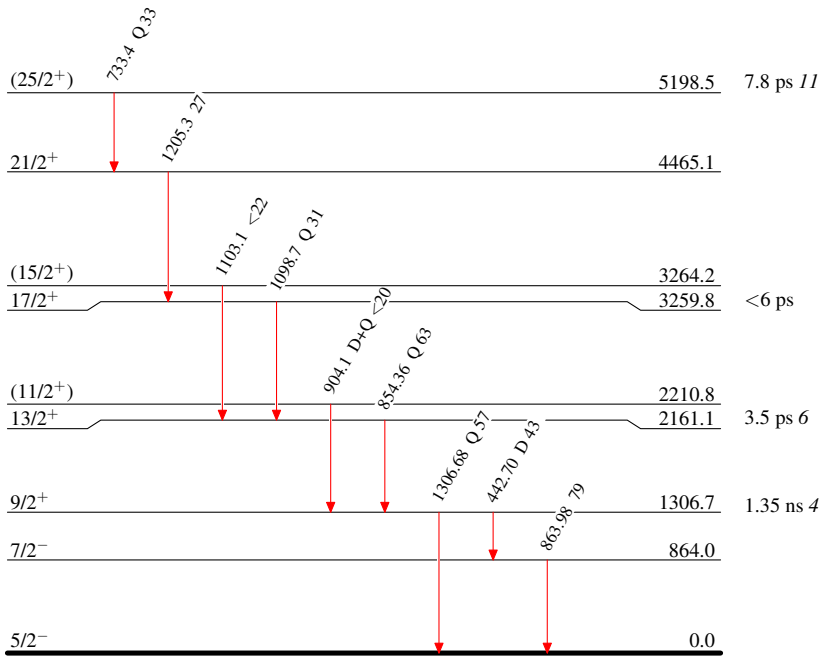
Level Scheme

Intensities: Relative I_γ

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



$^{69}_{33}As_{36}$