

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

$Q(\beta^-)=6640$ 50; $S(n)=4370$ 50; $S(p)=15830$ 90; $Q(\alpha)=-11200$ 60 [2017Wa10](#)

$S(2n)=12410$ 50, $S(2p)=31170$ 120 ([2017Wa10](#)).

First identification of ^{39}S nuclide by [1971Ar32](#).

Other measurements:

[1971Ar32](#): $^{232}\text{Th}(^{40}\text{Ar},\text{X})$ $E=290$ MeV.

[1980Hi01](#): ^{39}S produced in $^{40}\text{Ar}(n,2p)$ reaction.

[1997Fo01](#): $^{208}\text{Pb}(^{37}\text{Cl},\text{X})$ $E=230$ MeV. Measured yield of ^{39}S .

[1999Ai02](#): ^{39}S beam produced by fragmentation of ^{55}Mn beam at 50, 90 MeV/nucleon with a ^9Be target. Measured energy-integrated cross sections; deduced strong absorption radii.

[2008KI02](#): $^{39}\text{Cl}(\mu^-, \nu)$, $^{40}\text{Cl}(\mu^-, n\nu)$.

Other: [1975Ka38](#).

Following γ rays have been assigned to this nuclide in different decays and reactions; but none has been assigned in a level

scheme: 339.88 11, 398.61 14, 465.45 19, 904 7, 1126.2 7, 1524.6 7. Note that $398.61+1126.2=1524.8$; from ^{40}P β^-n decay,

339.88 γ and 398.61 γ are in coin with 465.45 γ , but not with each other; and $339.88+1126.2=1466.1$ which is close to 1469 group seen in $(^{13}\text{C}, ^{14}\text{O})$ reaction.

Level scheme is from [2016Ch33](#) in $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$.

 ^{39}S LevelsCross Reference (XREF) Flags

A	^{39}P β^- decay (0.28 s)	D	$^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$
B	^{40}P β^-n decay (150 ms)	E	$^9\text{Be}(^{48}\text{Ca}, \text{X}\gamma)$
C	$^{40}\text{Ar}(^{13}\text{C}, ^{14}\text{O})$	F	$^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0	(7/2) ⁻	11.5 s 5	ABCD	$\% \beta^- = 100$ J^π : $\log ft=5.06$ to $5/2^-$ in ^{39}Cl ; systematics of g.s. $J^\pi=7/2^-$ for $N=23$ isotones; probable $\pi f_{7/2}^3$ configuration (1989Dr03); $7/2^-$ from shell-model calculations (2016Ch33). Additional information 1. $T_{1/2}$: from 1980Hi01 .
58.73 18	(5/2) ⁻		AB D	
398.61 14	(3/2) ⁻		B D	
864.07 24	(3/2) ⁺		AB D	
1469 25			C	E(level): from $^{40}\text{Ar}(^{13}\text{C}, ^{14}\text{O})$.
1517.0 10	(11/2) ⁻		D	
1656.0? 10	(9/2) ⁻		D	

[†] From a least-squares fit to γ -ray energies, except where noted.

[‡] Based on intensity considerations and comparison to shell model calculations in $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$ ([2016Ch33](#)), unless otherwise noted.

Adopted Levels, Gammas (continued)

$\gamma(^{39}\text{S})$						
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	Comments
398.61	(3/2 ⁻)	339.88 11	81 10	58.73	(5/2 ⁻)	E_γ : from ^{40}P β^- -n decay. Others: 339.8 7 from ^{39}P β^- decay, 339 1 from $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$, 337 4 from $^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$ but not placed. I_γ : weighted average of 96 13 from $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$ and 75 8 from ^{40}P β^- -n decay.
		398.61 14	100 15	0	(7/2 ⁻)	E_γ : from ^{40}P β^- -n decay. Others: 398.2 7 from ^{39}P β^- decay, 398 1 from $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$, 392 6 from $^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$ but not placed.
864.07	(3/2 ⁺)	465.45 19	100	398.61	(3/2 ⁻)	E_γ : from ^{40}P β^- -n decay. Other: 466 1 from $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$, 466 4 from $^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$ but not placed.
1517.0	(11/2 ⁻)	1517 1	100	0	(7/2 ⁻)	E_γ : other: 1518 4 from $^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$ but not placed.
1656.0?	(9/2 ⁻)	1656 [‡] 1	100	0	(7/2 ⁻)	E_γ : other: 1655 6 from $^{12}\text{C}(^{48}\text{Ca}, \text{X}\gamma)$ but not placed.

[†] From $^{208}\text{Pb}(^{36}\text{S}, ^{39}\text{S}\gamma)$ (2016Ch33), unless otherwise noted.

[‡] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

