#### **Adopted Levels, Gammas**

	Н	listory		
ype	Author	Citation	Literature Cutoff Date	
valuation	Ninel Nica Balrai Singh	NDS 113 1563 (2012)	28-May-2012	

 $Q(\beta^{-})=-1.72\times10^{4} \text{ syst}; S(n)=17065.3 4; S(p)=4663.9 4; Q(\alpha)=-6744.2 4$ 

Note: Current evaluation has used the following Q record -17157 syst 17064.4 5 4663.1 6 -6740 3  $\Delta Q(\beta^{-}) = 298 \ (2011AuZZ).$ 

 $Q(\varepsilon p) = 919.5 \ 3$ ,  $S(2n) = 32319.7 \ 18$ ,  $S(2p) = 6939.8 \ 3$  (2011AuZZ).

Values in 2003Au03:  $Q(\beta^-)=16900\ 300\ (syst)$ ,  $S(n)=17064.4\ 5$ ,  $S(p)=4662.8\ 6$ ,  $Q(\alpha)=-6740\ 3$ ,  $Q(\varepsilon p)=919.8\ 4$ ,  $S(2n)=32319.6\ 18$ ,

Identification and production of <sup>34</sup>Ar isotope: 1966Mi11 and 1967Ba36 in <sup>32</sup>S + <sup>3</sup>He reaction; measured half-life.

 $^{34}$ S( $\pi^+,\pi^-$ ): 1993Bi10, 1991Bi07 (E=50 MeV), 1987Zu03 (E=292 MeV), measured  $\sigma$ .

Additional information 1.

Mass measurement: 2002He23 (also 2001He29,2001He37).

Nuclear radius measurement: 2002Oz03.

Structure calculations: 2006Or01 (levels, B(E2), shell model); 2005Ob01 (deformation, levels).

2007DoZV: found 1197 $\gamma$  and 2090 $\gamma$  (with two-step fragmentation reaction at relativistic energies)  ${}^{9}$ Be( ${}^{37}$ Ca,X $\gamma$ ) E=197.5 A MeV

2011Le01, 2010Le03: experimental (by two methods) and theoretical neutron spectroscopic factors and reduction factors for <sup>34</sup>Ar g.s. extracted from reaction  $p(^{34}Ar,d)$ ,  $E(^{34}Ar)=33$  MeV/nucleon.

## 34Ar Levels

### Cross Reference (XREF) Flags

 $^{35}$ Ca εp decay (25.7 ms) D

				B ${}^{1}\text{H}({}^{34}\text{Ar},\text{P}')$ E ${}^{36}\text{Ar}(\text{p,t})$ C ${}^{3}\text{He}({}^{32}\text{S},\text{n}\gamma),{}^{32}\text{S}({}^{3}\text{He},\text{n}\gamma)$
E(level)	$\mathbf{J}^{\pi}$	$T_{1/2}^{\dagger}$	XREF	Comments
0	0+	843.8 ms <i>4</i>	ABCDE	$%ε+%β^+=100$ < $r^2>^{1/2}=3.365$ fm 4 (2004An04 evaluation and its 2008 update on webpage: http://cdfe.sinp.msu.ru). $δ< r^2> (^{38}Ar, ^{34}Ar)=-0.251$ fm <sup>2</sup> 6 62, first is statistical and the second is systematic

uncertainty (1996Kl04, 2000Ge20).  $T_{1/2}$ : from 2006Ia05, half-life measured and analyzed using parent-daughter ( $^{34}$ Ar to <sup>34</sup>Cl decay) composite decay and a new fitting procedure, gas-ionization chamber used as detection system. Beam of pure <sup>34</sup>Ar ions was produced in <sup>1</sup>H(<sup>35</sup>Cl,2n) reaction. Others: 844.5 ms 34 (1974Ha26, also 1972Ha58), 0.85 s 10 (1967Ba36), 1.2 s *3* (1966Mi11).

 $^{32}S(^{3}He,n)$ 

Additional information 2.

2091.1 3 319 fs 42 ABCDE  $\beta_2(p,p')=0.27\ 2\ (2001Kh17).$  $J^{\pi}$ : L(p,t)=L(p,p')=2.

 $T_{1/2}$ : 2001Ra27 evaluation lists 305 fs 49 which is close to the value given here from 1985Al18. It seems a somewhat different averaging procedure is used in 2001Ra27.

3287.7 <i>5</i>	2+	194 fs <i>35</i>	A CDE	$J^{\pi}$ : L(p,t)=2.
3873 <i>3</i>	$0_{+}$	>187 fs	A CDE	$J^{\pi}$ : L(p,t)=0.
4050 14			DE	
4127.8 <i>10</i>		<208 fs	CD	
4513.2 8	3-	201 fs 38	BCDE	$\beta_3(p,p')=0.39 \ 3 \ (2001Kh17).$
				$J^{\pi}$ : L(p,p')=L( <sup>3</sup> He,n)=3.
4631 <i>4</i>			CE	
4865 <i>4</i>			CE	
4967 <i>4</i>	$0_{+}$		CDE	$J^{\pi}$ : L(p,t)=0.

## **Adopted Levels, Gammas (continued)**

# <sup>34</sup>Ar Levels (continued)

E(level)	$J^{\pi}$	XREF	Comments			
5255? 4		С				
5307 <i>13</i>	$(5^{-})$	DE	$J^{\pi}$ : L( ${}^{3}$ He,n)=(5).			
5542 <i>4</i>		C				
5620 <i>30</i>	2+	D	$J^{\pi}$ : L( <sup>3</sup> He,n)=2.			
5909 12	$0^{+}$	DE	$J^{\pi}$ : L( <sup>3</sup> He,n)=0.			
6074 11	2+	E	$J^{\pi}$ : L(p,t)=2.			
6525 9	2+	DE	$J^{\pi}$ : $L(p,t)=2$ .			
6794 <i>11</i>		DE				
6990 <i>50</i>		D				
7322 6	2+	DE	$J^{\pi}$ : $L(p,t)=2$ .			
7499 <i>4</i>	$(2^{+})$	E	$J^{\pi}$ : L(p,t)=(2).			
7925 5		E				

<sup>&</sup>lt;sup>†</sup> From DSAM in  ${}^{3}\text{He}({}^{32}\text{S},n\gamma), {}^{32}\text{S}({}^{3}\text{He},n\gamma)$ . Most values are from 1985A118.

$E_i(level)$	$J_i^{\pi}$	$E_{\gamma}^{\dagger}$	$I_{\gamma}^{\dagger}$	$\mathbf{E}_f  \mathbf{J}_f^{\pi}$	Mult. <sup>†</sup>	$\delta^{\dagger}$	Comments
2091.1	2+	2091.1 3	100	$0 0^{+}$	E2		B(E2)(W.u.)=6.8 9
3287.7	2+	1196.6 <i>4</i>	100 5	2091.1 2+	M1+E2	+0.12 5	B(M1)(W.u.)=0.060 12; B(E2)(W.u.)=2.4 20
		3286 4	96	$0  0^{+}$	[E2]		B(E2)(W.u.)=0.10 7
3873	$0_{+}$	585 <sup>#</sup>	<43	3287.7 2 <sup>+</sup>			
		1782 <i>3</i>	100	2091.1 2+	[E2]		B(E2)(W.u.)<21
4127.8		840.1 9	100 6	$3287.7 \ 2^{+}$			
		2037	11 6	$2091.1 \ 2^{+}$			
		4128 <sup>#</sup>	<11	$0  0^{+}$			
4513.2	3-	1225.5 6	100 11	$3287.7 \ 2^{+}$	[E1]		B(E1)(W.u.)=0.0016 4
		2422	11 <i>3</i>	$2091.1 \ 2^{+}$	[E1]		$B(E1)(W.u.)=2.2\times10^{-5} 8$
4631		2540	100	2091.1 2+			$% I\gamma > 50.$
4865		2774	100	$2091.1 \ 2^{+}$			$\%$ I $\gamma$ >50.
4967	$0_{+}$	841 <sup>#</sup>	<20	4127.8			
		2876	100	$2091.1 \ 2^{+}$			$% I\gamma > 50.$
5255?		3164 <sup>#</sup>	100	2091.1 2+			$\%$ I $\gamma$ >50.
5542		911	54 <sup>‡</sup> 16	4631			
		1029	100 <sup>‡</sup> <i>16</i>	4513.2 3			

<sup>&</sup>lt;sup>†</sup> From  ${}^{3}\text{He}({}^{32}\text{S,n}\gamma), {}^{32}\text{S}({}^{3}\text{He,n}\gamma).$ 

<sup>‡</sup> Tentative value of branching ratio. # 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)

