Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 126, 1 (2015)	31-Mar-2015

Q(β^-)=12.13×10^3 *10*; S(n)=2629 *6*; S(p)=20.49×10^3 *21*; Q(α)=−16940 *90* 2012Wa38
S(2n)=9330 *6*, S(2p)=38890 *370*, Q(β^-n)=4650 *140* (2012Wa38).
First identification of ^{43}S nuclide by 1979We10.
^{43}S isotope produced and identified in ^{9}Be(^{48}Ca,X) E=212 MeV/nucleon (1979We10); ^{181}Ta(^{48}Ca,X) (1989Le16) and Th(p,X) E=800 MeV (1991Zh24), followed by measurement of fragment spectra. Measured (1989Le16) %β^-n, $T_{1/2}$.
2012Ch16: TDPAD method used to measure spectroscopic quadrupole moment of 7/2$^-$ isomeric state of ^{43}S at 320.5 keV. E=345 MeV/nucleon beam produced at RIKEN-RBF facility using BigRIPS spectrometer for fragment separation. ^{43m}S fragments were selected and implanted in Cu host. The g factor was first measured to validate the method. The 320.5-keV γ-ray was measured using four HPGe detectors. Time spectrum of each detector was used to generate R(t) function.
Mass measurement: 2012Ga45, 2009Ri12, 2007Ju03, 2000Sa21, 1991Zh24.
Mean-square radius from energy-integrated cross sections: 2006Kh08.
Structure calculations: 2011Ka03, 2010Ga15, 2009Ha02.

^{43}S Levels

Cross Reference (XREF) Flags

- A ^{43}S IT decay (415 ns)
- B ^{9}Be(^{44}S,Xγ)
- C ^{9}Be(^{45}Cl,Xγ)
- D Coulomb excitation

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0[#]	(3/2$^-$)	265 ms *15*	ABCD	%β^-=100; %β^-n=40 *10* (1989Le16) Configuration=$\nu p_{3/2}$. This state is found to be part of well deformed K=1/2 decoupled rotational band from shell-model calculations. J$^\pi$: 3/2$^-$ proposed from shell-model (2000Sa21,2009Ri11,2009Ga05); 7/2$^-$ proposed (1999Ib01) from syst. $T_{1/2}$: weighted average of 282 ms *27* (2004Gr20) and 260 ms *15* (1998WiZV), from β(^{43}S) time correlation measurements. Other: 220 ms *+80−50* (1989Le16). Measured mean-square radius (r_0^2)=1.22 fm^2 *6* (2006Kh08).
320.7 *5*	(7/2$^-$)	415 ns *5*	A	μ=−1.110 *14* (2009Ga05,2014StZZ) Q=0.23 *3* (2012Ch16,2014StZZ) $T_{1/2}$: from 2009Ga05. Other: 0.48 μs *5* (2000Sa21). J$^\pi$: 7/2$^-$ proposed from shell-model calculations (2000Sa21); also from agreement of g(Schmidt)=−0.546 for $\nu f_{7/2}$ with the experimental value (2009Ga05). μ: from g factor=−0.317 *4* (2009Ga05) by TDPAD method, the uncertainty includes the statistical and that in the magnetic field. Q: TDPAD method (2012Ch16). This value is significantly larger than predicted by single-particle state which suggests that the isomer is not a spherical state (2012Ch16), only the magnitude is known, not the sign.
970[#] *5*	(5/2$^-$,7/2$^-$)[‡]		BCD	
1153[#] *5*	(5/2$^-$,7/2$^-$)[‡]		BC	
2616 *9*	(7/2$^-$)[‡]		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{43}S Levels (continued)

† From least-squares fit to Eγ data.
‡ Proposed from shell-model calculations (2009Ri11).
# Band(A): Ground-state band.

γ(^{43}S)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π	Mult.	Comments
320.7	(7/2⁻)	320.7‡ *5*		0	(3/2⁻)	[E2]	B(E2)(W.u.)=0.040 *4* B(E2)↓=0.357×10^{-4} *36* (2001Sa72) B(E2)=0.517×10^{-4} *52* in 2000Sa21 (same group as 2001Sa72) seems a misprint. E_γ: from ^{43}S IT decay. This γ either feeds the g.s. or a very close-lying level of energy <50 keV. Mult.: for mult=M1 or E1, deduced hindrance factors are unrealistically large. Mult=E2 would be compatible with the measured lifetime.
970	(5/2⁻,7/2⁻)	971 *6*	100	0	(3/2⁻)		
1153	(5/2⁻,7/2⁻)	183 *1*	53 *3*	970	(5/2⁻,7/2⁻)		
		1154 *7*	100	0	(3/2⁻)		
2616	(7/2⁻)	1468 *9*	5 *3*	1153	(5/2⁻,7/2⁻)		
		2600 *16*	100 *7*	0	(3/2⁻)		

† From ^{9}Be(^{44}S,Xγ) unless otherwise noted.
‡ Placement of transition in the level scheme is uncertain.

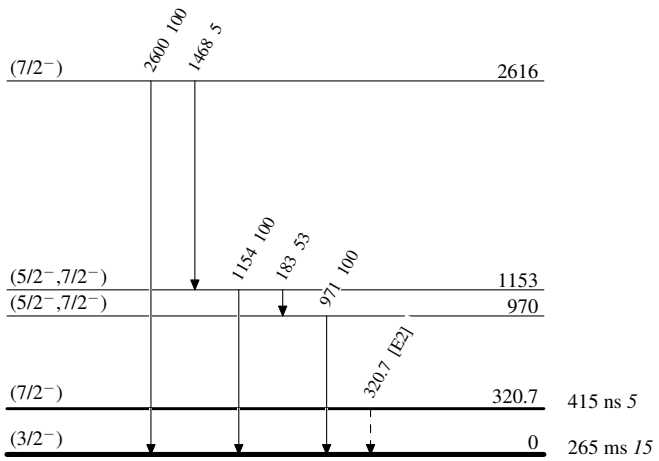
Adopted Levels, Gammas

Legend

Level Scheme

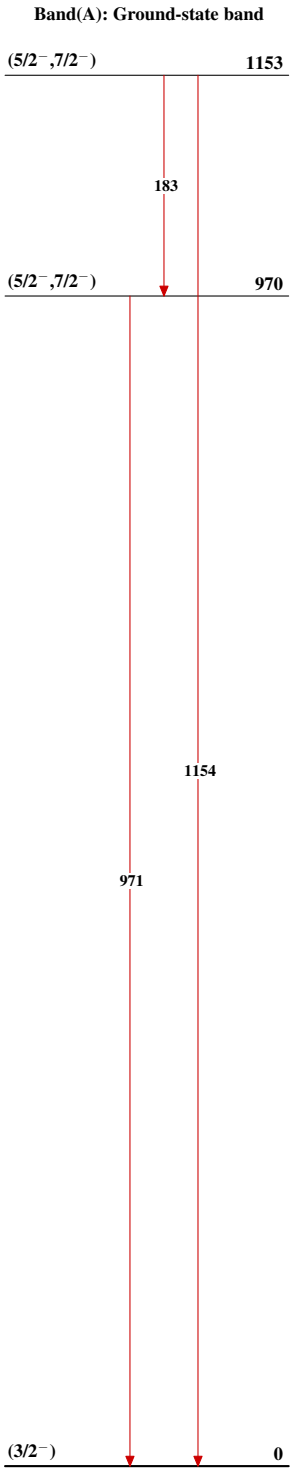
Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)



$^{43}_{16}S_{27}$

Adopted Levels, Gammas



$^{43}_{16}S_{27}$