

$^{52}\text{Cr}(n,n'\gamma)$  1978Ka21,2011Ad14,1989Ge09

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde		NDS 128, 185 (2015)	10-Jul-2015

1962Va24: E=0.98-3.31 MeV, measured  $\gamma$ -spectrum,  $d\sigma/d\Omega(E\gamma,\theta)$  NaI scintillation deutron sourcetector.

1978Ka21: E=0.84-3.97 MeV, measured  $\gamma$ -spectrum,  $d\sigma/d\Omega(E\gamma,\theta)$  a 40 cm<sup>3</sup> Ge(Li) detector, plastic scintillation detector.

1989Ge09: fast neutrons, measured lifetimes of excited levels, DSAM. three Ge(Li) detectors with different volumes and energy resolution of the  $\gamma$ -ray of <sup>60</sup>Co of energy 1.33 MeV: 28 cm<sup>3</sup> (2.6 keV), 52 cm<sup>3</sup> (2.8 keV), 75 cm<sup>3</sup> (3.0 keV).

2007Mi07: E=3-18 MeV, pulsed white-neutron source, measured  $E\gamma$ ,  $I\gamma$  and  $\text{SIGMA}(E\gamma)$ , two large volume HPGe detectors, energy resolution for both detectors: 2.4 keV FWHM at 1.33 MeV; time resolution: 4-6 NS FWHM.

2011Ad14: E=thermal. Target: natural <sup>52</sup>Cr. Gamma rays detected by A Compton scattering suppressed system composed of a Ge detector placed inside a ring of NaI(Tl) crystal 150 by 100 mm in size. Measured  $E\gamma$ ,  $I\gamma$ . Deduced level energies, lifetimes using Doppler Shift Attenuation method (DSA).

Others: see earlier evaluation (1978Be37).

 $^{52}\text{Cr}$  Levels

E(level)	$J^\pi$ &	$T_{1/2}$ #	Comments
0.0	0 <sup>+</sup>		
1434	2 <sup>+</sup> <sup>a</sup>	>0.49 ps	
2370	4 <sup>+</sup> <sup>a</sup>		
2647	0 <sup>+</sup> <sup>a</sup>		
2768	4 <sup>+</sup> <sup>a</sup>		
2965	2 <sup>+</sup> <sup>a</sup>	0.42 ps 21	
3114	6 <sup>+</sup>		
3162	2 <sup>+</sup> <sup>a</sup>	0.035 ps 7	
3415	4 <sup>+</sup>		
3472	3 <sup>+</sup>	>0.49 ps	
3616 <sup>‡</sup>	5 <sup>+</sup>	0.10 ps 7	
3772	2 <sup>+</sup>	0.009 ps 3	$T_{1/2}$ : other: 11.1 fs 14 (1989Ge09).
3949	2 <sup>+</sup>	0.014 ps 7	$T_{1/2}$ : other: 33 fs 6 (1989Ge09).
4040 <sup>†</sup>	4 <sup>+</sup>	26 <sup>@</sup> fs 5	
4563 <sup>†</sup>	3 <sup>-</sup>	40 <sup>@</sup> fs 6	
4752 <sup>‡</sup>	8 <sup>+</sup>	0.08 ps 10	

<sup>†</sup> From 1989Ge09.

<sup>‡</sup> From 2011Ad14.

# From 2011Ad14, DSAM, except As noted.

@ From 1989Ge09, DSAM.

& From adopted  $J^\pi$  values.

<sup>a</sup> 1962Va24, on the basis of their own (n,n' $\gamma$ ) work, and (p,p') work of other authors, deduce several  $J^\pi$  values that are consistent with the adopted values.

 $\gamma(^{52}\text{Cr})$ 

From 1978Ka21, except as noted.

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$
1434	2 <sup>+</sup>	1434.07 <sup>‡</sup>	100	0.0	0 <sup>+</sup>
2370	4 <sup>+</sup>	935.54 <sup>‡</sup>	100	1434	2 <sup>+</sup>

Continued on next page (footnotes at end of table)

$^{52}\text{Cr}(n,n'\gamma)$  **1978Ka21,2011Ad14,1989Ge09** (continued) $\gamma(^{52}\text{Cr})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma$	$E_f$	$J_f^\pi$	Comments
2647	0 <sup>+</sup>	1212.8 <sup>‡</sup>	100	1434	2 <sup>+</sup>	
2768	4 <sup>+</sup>	1333.65 <sup>‡</sup>	100	1434	2 <sup>+</sup>	
2965	2 <sup>+</sup>	1530.67 <sup>‡</sup>	100	1434	2 <sup>+</sup>	
3114	6 <sup>+</sup>	744.23 <sup>‡</sup>	100	2370	4 <sup>+</sup>	
3162	2 <sup>+</sup>	1727.53 <sup>‡</sup>	100.0 <i>I2</i>	1434	2 <sup>+</sup>	
		3162 <i>I</i>	12.7 <i>I2</i>	0.0	0 <sup>+</sup>	
3415	4 <sup>+</sup>	647.53 <sup>‡</sup>	100	2768	4 <sup>+</sup>	
3472	3 <sup>+</sup>	704.6 <sup>‡</sup>	100 <sup>‡</sup>	2768	4 <sup>+</sup>	
		2038.0 <sup>‡</sup>	42 <sup>‡</sup> <i>I2</i>	1434	2 <sup>+</sup>	
3616	5 <sup>+</sup>	1246.28 <sup>‡</sup>		2370	4 <sup>+</sup>	
3772	2 <sup>+</sup>	2337.44 <sup>‡</sup>	100	1434	2 <sup>+</sup>	$I_\gamma$ : assuming an 84% branching ratio for 2337 $\gamma$ (1978Ka21). $E_\gamma$ : 3771 $\gamma$ was not seen in 1978Ka21.
		(3771 <i>I</i> )	19	0.0	0 <sup>+</sup>	
3949	2 <sup>+</sup>	1578	100	2370	4 <sup>+</sup>	
4752	8 <sup>+</sup>	1637 <sup>†</sup>	100	3114	6 <sup>+</sup>	

† From 2011Ad14.

‡ From 2007Mi07.

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Legend

Level Scheme

Intensities: relative photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)