

$^{48}\text{Ti}(^{12}\text{C},\text{p}2\text{n}\gamma), ^{54}\text{Fe}(\alpha,\text{p}\gamma)$ 1977Be16

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. R. Bhat	NDS 85, 415 (1998)	24-Sep-1998

E=26 to 48 MeV, in 4-MeV steps, for $(^{12}\text{C},\text{p}2\text{n}\gamma)$ and 12, 15, 18, 20, and 24 MeV for $^{54}\text{Fe}(\alpha,\text{p}\gamma)$. Excitation function, $\gamma(\theta)$, $\gamma\gamma$ -coincidences, directional correlation of oriented nuclei (DCO), DSA.
See also $^{54}\text{Fe}(\alpha,\text{p}),(\alpha,\text{p}\gamma)$.

 ^{57}Co Levels

E(level)	J^π [†]	$T_{1/2}$	Comments
0.0	$7/2^-$		
1223.7	$9/2^-$	59 fs 21	
1689.8	$11/2^-$	0.22 ps 7	
2524	$(13/2)^-$	0.11 ps 4	J^π : $(13/2)$; J=9/2 to 13/2 from $\gamma(\theta)$ and DCO. $\delta=-0.63$ 10 for J=11/2 and $T_{1/2}$ give extremely enhanced Q transition which excludes J=11/2. γ -deexcitation and stronger excitation of this level in $(^{12}\text{C},2\text{npy})$ than in $(\alpha,\text{p}\gamma)$ make J=9/2 very improbable.
4037	$(15/2)$	0.07 ps 5	J^π : $(15/2)$; J=11/2 to 15/2 from $\gamma(\theta)$ and DCO. From $T_{1/2}$ and quadrupole transition probabilities, J=11/2 and 15/2 remain the most probable. J=15/2 favored from unique decay to $(13/2^-)$ state and very weak excitation in $(\alpha,\text{p}\gamma)$.
4814	$(17/2)$	9.9 ps 2	$T_{1/2}$: from 1981Ke05 ($E(^{12}\text{C})=39$ MeV; RDM). Other: 1.0 ps +28-3 (1977Be16). J^π : 17/2 most likely from strong excitation in $(^{12}\text{C},\text{p}2\text{n}\gamma)$ compared to $(\alpha,\text{p}\gamma)$ and stretched-quadrupole radiation.
5918	$(19/2)$	0.12 ps 6	J^π : 15/2,19/2 from $\gamma(\theta)$ and DCO. 19/2 from unique decay to $(17/2^-)$ state.

[†] From Adopted Levels; supporting arguments from this data set are indicated.

 $\gamma(^{57}\text{Co})$

$E_i(\text{level})$	J_i^π	E_γ	I_γ [†]	E_f	J_f^π	Mult. [‡]	δ [‡]	Comments
1223.7	$9/2^-$	1223.7		0.0	$7/2^-$	M1+E2	+0.26 1	δ : 0.32 9 reported by 1977Be16 with a negative sign; must be a misprint. See also 1978Kr19.
1689.8	$11/2^-$	466.0		1223.7	$9/2^-$	(M1+E2)	+0.08 1	
		1689.8		0.0	$7/2^-$	E2		
2524	$(13/2)^-$	833.9		1689.8	$11/2^-$	M1+E2	-0.15 7	
4037	$(15/2)$	1513.5		2524	$(13/2)^-$	D(+Q)	+0.03 +7-13	
4814	$(17/2)$	777 [#]	<15	4037	$(15/2)$			Not observed.
		2290.8	100	2524	$(13/2)^-$	(Q)		
5918	$(19/2)$	1103.8		4814	$(17/2)$	M1+E2	+0.16 7	

[†] Relative photon branching ratios from each level.

[‡] From adopted gammas.

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

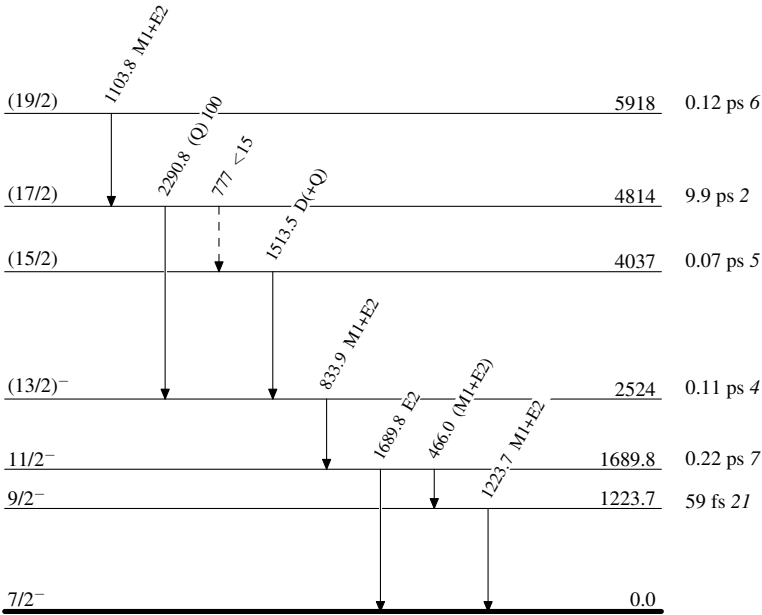
⁴⁸Ti(¹²C,p2nγ), ⁵⁴Fe(α,pγ) 1977Be16

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)



⁵⁷Co₃₀