

$^{54}\text{Fe}(^{12}\text{C},\text{pn}\gamma)$  1984ScZO

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

1984ScZO (also 1984Sc20 abstract):  $E(^{12}\text{C})=32.5\text{-}45$  MeV. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin, ce,  $\gamma(\theta)$ , n- $\gamma\gamma$  coin, n-ce coin,  $T_{1/2}$ (level) by recoil-distance Doppler-shift method. Details of this study are not available.

Others:

1990LiZS:  $^{12}\text{C}(^{54}\text{Fe},\text{pn}\gamma),E(^{12}\text{C})=165$  MeV, analysis of recoil- $\gamma\gamma$  data. No details are available.

1986Oo01:  $E(^{12}\text{C})=150$  MeV. Measured  $E\gamma$ , n, n $\gamma$ -coin, n $\gamma\gamma$ -coin. Eight  $\gamma$  rays in  $^{64}\text{Ga}$  identified at 128, 235, 278, 367, 483, 495, 664 and 1134 keV.

1980MuZV (also 1979MuZX):  $^{40}\text{Ca}(^{28}\text{Si},3\text{pn}),E(^{28}\text{Si})=93, 120$  MeV. Measured  $E\gamma$ ,  $I\gamma$ ,  $\gamma\gamma$ -coin,  $\gamma(\theta)$ , n $\gamma$ -coin, n- $\gamma\gamma$ -coin.

Two levels reported at 707 (664 $\gamma$ ) and 537 (495 $\gamma$  and 367 $\gamma$ ) keV, both with J=4 assignment.

1979SuZY: the main study is for  $^{64}\text{Ge}$  from ( $^{12}\text{C},2\text{n}\gamma$ ) channel, but the  $\gamma$  spectrum must have contained many lines from  $^{64}\text{Ga}$  also.

$^{64}\text{Ga}$  Levels

The level scheme is based on various types of coin data in 1984ScZO.

$E(\text{level})^\ddagger$	$J\pi^\dagger$	$E(\text{level})^\ddagger$	$J\pi^\dagger$	$E(\text{level})^\ddagger$	$J\pi^\dagger$	$E(\text{level})^\ddagger$	$J\pi^\dagger$
0.0	$0^+$	707.6 1	$(4^+)$	1798.6 1	$(6^+)$	2396.4 3	$(7^-)$
43.0 1	$(2^+)$	829.0 2		1842.9 2	$(5^-)$	3089.6 2	$(8^-)$
171.1 1	$(3^+)$	1020.9 1	$(5^+)$	1949.6 2	$(6^+)$	3102.8 2	$(9^-)$
323.1 1	$(2^+)$	1279.9 2	$(4^+)$	2033.3 1	$(7^-)$	3164.0 3	
534.6 2	$(3^+)$	1357.2 2	$(5^+)$	2053.0 2	$(6^+)$	3574.0 2	$(9^+)$
538.1 1	$(4^+)$	1478.8 2		2104.4 4		4473.1 3	$(11^+)$
605.2 2		1685.2 2	$(5^+)$	2353.7 4		5629.2 4	$(12)$

$^\dagger$  The assignments are taken from 1984ScZO which are most likely based on  $\gamma(\theta)$  and ce data for levels above 43 keV. The assignments are the same in the Adopted Levels.

$^\ddagger$  From a least-squares fit to  $E\gamma$  data.

$\gamma(^{64}\text{Ga})$

$E_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	$E_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
43.0 $^\ddagger$	43.0	$(2^+)$	0.0	$0^+$	367.8 $\#$	2053.0	$(6^+)$	1685.2	$(5^+)$
128.1 $^\ddagger$	171.1	$(3^+)$	43.0	$(2^+)$	384.5 $\#$	707.6	$(4^+)$	323.1	$(2^+)$
152.0 $@$	323.1	$(2^+)$	171.1	$(3^+)$	419.2 $@$	2104.4		1685.2	$(5^+)$
173.0 $\#$	707.6	$(4^+)$	534.6	$(3^+)$	434.1 $@$	605.2		171.1	$(3^+)$
190.4 $^\ddagger$	2033.3	$(7^-)$	1842.9	$(5^-)$	471.2 $\#$	3574.0	$(9^+)$	3102.8	$(9^-)$
210.1 $\#$	2053.0	$(6^+)$	1842.9	$(5^-)$	482.8 $^\ddagger$	1020.9	$(5^+)$	538.1	$(4^+)$
234.7 $^\ddagger$	2033.3	$(7^-)$	1798.6	$(6^+)$	484.4 $^\ddagger$	3574.0	$(9^+)$	3089.6	$(8^-)$
280.1 $^\ddagger$	323.1	$(2^+)$	43.0	$(2^+)$	486.3 $\#$	1020.9	$(5^+)$	534.6	$(3^+)$
282.1 $@$	605.2		323.1	$(2^+)$	491.6 $\#$	534.6	$(3^+)$	43.0	$(2^+)$
290.9 $@$	829.0		538.1	$(4^+)$	495.1 $^\ddagger$	538.1	$(4^+)$	43.0	$(2^+)$
313.3 $@$	1020.9	$(5^+)$	707.6	$(4^+)$	536.5 $\#$	707.6	$(4^+)$	171.1	$(3^+)$
323.1 $@$	323.1	$(2^+)$	0.0	$0^+$	553.5 $@$	2396.4	$(7^-)$	1842.9	$(5^-)$
363.5 $\#$	534.6	$(3^+)$	171.1	$(3^+)$	563.0 $@$	1842.9	$(5^-)$	1279.9	$(4^+)$
367.0 $^\ddagger$	538.1	$(4^+)$	171.1	$(3^+)$	572.3 $@$	1279.9	$(4^+)$	707.6	$(4^+)$

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${}^{54}\text{Fe}({}^{12}\text{C},\text{pn}\gamma)$  **1984ScZO (continued)** $\gamma({}^{64}\text{Ga})$  (continued)

$E_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	$E_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$
592.4@	1949.6	(6 <sup>+</sup> )	1357.2	(5 <sup>+</sup> )	944.2@	1478.8		534.6	(3 <sup>+</sup> )
664.3@	1685.2	(5 <sup>+</sup> )	1020.9	(5 <sup>+</sup> )	969.6@	1798.6	(6 <sup>+</sup> )	829.0	
664.6‡	707.6	(4 <sup>+</sup> )	43.0	(2 <sup>+</sup> )	1012.4‡	2033.3	(7 <sup>-</sup> )	1020.9	(5 <sup>+</sup> )
693.2@	3089.6	(8 <sup>-</sup> )	2396.4	(7 <sup>-</sup> )	1032.1#	2053.0	(6 <sup>+</sup> )	1020.9	(5 <sup>+</sup> )
695.8@	2053.0	(6 <sup>+</sup> )	1357.2	(5 <sup>+</sup> )	1056.3‡	3089.6	(8 <sup>-</sup> )	2033.3	(7 <sup>-</sup> )
741.8@	1279.9	(4 <sup>+</sup> )	538.1	(4 <sup>+</sup> )	1069.5‡	3102.8	(9 <sup>-</sup> )	2033.3	(7 <sup>-</sup> )
745.3@	1279.9	(4 <sup>+</sup> )	534.6	(3 <sup>+</sup> )	1091.0‡	1798.6	(6 <sup>+</sup> )	707.6	(4 <sup>+</sup> )
771.2@	1478.8		707.6	(4 <sup>+</sup> )	1108.8#	1279.9	(4 <sup>+</sup> )	171.1	(3 <sup>+</sup> )
777.7#	1798.6	(6 <sup>+</sup> )	1020.9	(5 <sup>+</sup> )	1111.0#	3164.0		2053.0	(6 <sup>+</sup> )
819.1#	1357.2	(5 <sup>+</sup> )	538.1	(4 <sup>+</sup> )	1135.3‡	1842.9	(5 <sup>-</sup> )	707.6	(4 <sup>+</sup> )
822.0@	1842.9	(5 <sup>-</sup> )	1020.9	(5 <sup>+</sup> )	1156.1@	5629.2	(12)	4473.1	(11 <sup>+</sup> )
849.8‡	1020.9	(5 <sup>+</sup> )	171.1	(3 <sup>+</sup> )	1186.1@	1357.2	(5 <sup>+</sup> )	171.1	(3 <sup>+</sup> )
856.2@	1685.2	(5 <sup>+</sup> )	829.0		1260.5‡	1798.6	(6 <sup>+</sup> )	538.1	(4 <sup>+</sup> )
899.1#	4473.1	(11 <sup>+</sup> )	3574.0	(9 <sup>+</sup> )	1332.8@	2353.7		1020.9	(5 <sup>+</sup> )
928.7@	1949.6	(6 <sup>+</sup> )	1020.9	(5 <sup>+</sup> )	1411.5#	1949.6	(6 <sup>+</sup> )	538.1	(4 <sup>+</sup> )
940.7#	1478.8		538.1	(4 <sup>+</sup> )	1514.1#	1685.2	(5 <sup>+</sup> )	171.1	(3 <sup>+</sup> )

† Uncertainties assumed as 0.1 keV for strong, 0.2 keV for medium intensity and 0.3 keV for weak  $\gamma$  rays (evaluators).

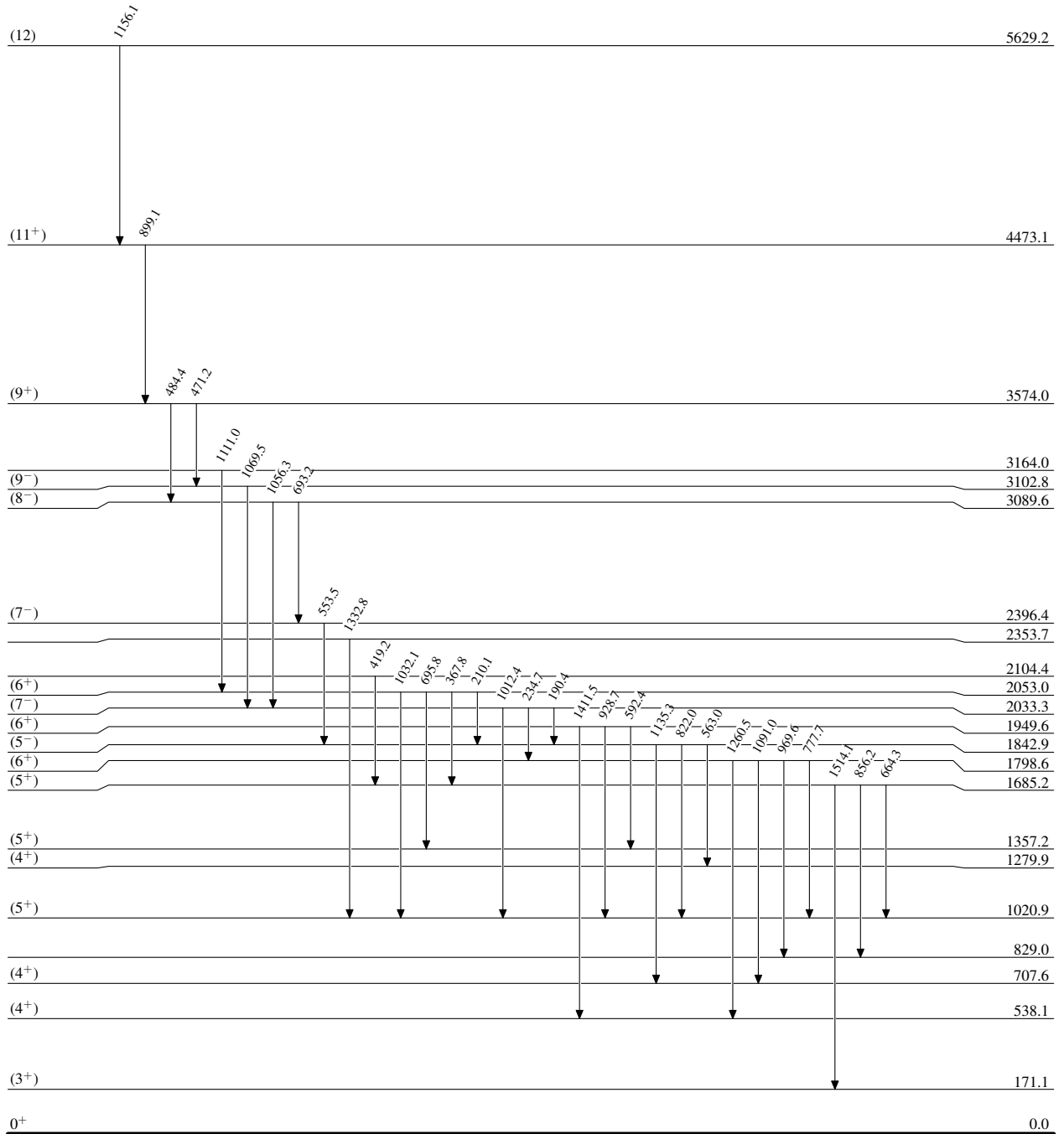
‡ Strong intensity transition.

# Medium intensity transition.

@ Weak transition.

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Level Scheme



$^{64}_{31}\text{Ga}_{33}$

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## Level Scheme (continued)

