^{57}Fe(n,γ),(n,n):resonances 2006MuZX

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Caroline D. Nesaraja, Scott D. Geraedts and Balraj Singh	NDS 111, 897 (2010)	12-Jan-2010

Measurements: 1975RaZB (E(n)<30 keV), 1974GoZH (E(n)<300 keV), 1969Ro19 (E(n)=100-160 keV).
Additional information 1.
J^π=1/2$^-$ for ^{57}Fe ground state.
Values of E(n), J^π, L-values and other parameters are from 2006MuZX evaluation; g=statistical weight factor.

^{58}Fe Levels

E(level)[‡]	J$^\pi$[†]	L	$g\Gamma_n\Gamma_\gamma/\Gamma$ (meV)	Comments
10041.05 *18*	1$^-$	0		E(n)(lab)=−3.61.
10046.20 *18*	2$^+$	1	0.051 *3*	2gΓ_n=0.11 eV *4*, E(n)(lab)=1.63 *1*.
10048.48 *18*	0$^-$	0	0.195 *20*	2gΓ_n=107 eV *8*,Γ_γ=1.1 eV *1*, E(n)(lab)=3.955 *8*.
10049.26 *18*	$^+$	1	0.043 *2*	2gΓ_n=0.094 eV *4*, E(n)(lab)=4.750 *8*.
10050.71 *18*	1$^-$	0	0.86 *8*	2gΓ_n=570 eV *30*,Γ_γ=1.15 eV *11*, E(n)(lab)=6.22 *1*.
10051.69 *18*	($^+$)	(1)	0.420 *4*	2gΓ_n=1.70 eV *12*,Γ_γ=1.66 eV *17*, E(n)(lab)=7.22 *1*.
10052.40 *18*	($^+$)	(1)	0.16 *1*	2gΓ_n=0.46 eV *3*, E(n)(lab)=7.944 *10*.
10052.97 *18*	($^+$)	(1)	0.008 *2*	2gΓ_n=0.016 eV *4*, E(n)(lab)=8.527 *10*.
10053.64 *18*	($^+$)	(1)	0.028 *2*	2gΓ_n=0.060 eV *4*, E(n)(lab)=9.207 *10*.
10056.48 *18*	($^+$)	(1)	0.013 *1*	2gΓ_n=0.026 eV *2*, E(n)(lab)=12.09 *2*.
10057.17 *18*	($^+$)	(1)	0.39 *2*	2gΓ_n=2.6 eV *3*,Γ_γ=0.114 eV *4*, E(n)(lab)=12.80 *2*.
10057.68 *18*	($^+$)	(1)	0.083 *10*	2gΓ_n=0.20 eV *2*, E(n)(lab)=13.31 *2*.
10058.30 *18*	1$^-$	0	0.70 *4*	2gΓ_n=20 eV *2*,Γ_γ=1.00 eV *5*, E(n)(lab)=13.95 *2*.
10058.49 *18*		≥1	0.004 *3*	2gΓ_n=0.008 eV *6*, E(n)(lab)=14.14 *2*.
10062.34 *18*	($^+$)	(1)	0.21 *2*	2gΓ_n=0.7 eV *5*, E(n)(lab)=18.06 *2*.
10062.52 *18*	($^-$)	(0)	0.51 *3*	2gΓ_n=9.6 eV *6*,Γ_γ=1.14 eV *6*, E(n)(lab)=18.24 *2*.
10062.98 *18*	($^+$)	(1)	0.037 *4*	2gΓ_n=0.080 eV *8*, E(n)(lab)=18.71 *2*.
10065.28 *18*	($^+$)	(1)	0.28 *2*	2gΓ_n=3.8 keV, Γ_γ=0.66 eV *4*, E(n)(lab)=21.05 *2*.
10065.52 *18*	($^-$)	(0)	0.54 *4*	2gΓ_n=8 eV *1*,Γ_γ=1.24 eV *8*, E(n)(lab)=21.290 *21*.
10065.6 *3*			0.10 *2*	E(n)(lab)=21.37 *21*.
10069.94 *18*		≥1	0.014 *3*	2gΓ_n=0.03 eV *6*, E(n)(lab)=25.79 *3*.
10071.33 *18*	($^+$)	(1)	0.10 *1*	2gΓ_n=0.24 eV *2*, E(n)(lab)=27.2 *3*.
10072.73 *18*	($^-$)	(0)	0.42 *3*	2gΓ_n=8.2 eV *10* ,Γ_γ=0.89 eV *6*, E(n)(lab)=28.63 *3*.
10073.14 *19*	1$^-$	0	2.7 *5*	2gΓ_n=5.2 keV *6* ,Γ_γ=3.5 eV *7* ,Γ_n=513. E(n)(lab)=29.05 *6*.
10075.98 *18*	($^+$)	(1)	0.23 *2*	2gΓ_n=0.82 eV *8*, E(n)(lab)=31.94 *3*.
10079.18 *18*		≥1	0.54 *3*	E(n)(lab)=35.19 *4*.
10081.07 *18*	($^+$)	(1)	3.40 *2*	2gΓ_n=9 eV *1*, E(n)(lab)=37.11 *4*.
10081.83 *18*	($^+$)	(1)	0.13 *2*	2gΓ_n=0.34 eV *4*, E(n)(lab)=37.89 *4*.
10083.30 *18*	($^-$)	(0)	0.5 *3*	2gΓ_n ≈ 16 eV,Γ_γ=0.95 eV *6*, E(n)(lab)=39.38 *4*.
10083.71 *19*	($^+$)	(1)	0.09 *1*	2gΓ_n=0.22 eV *2*, E(n)(lab)=39.80 *4*.
10085.28 *20*	1$^-$	0	3.6 *8*	2gΓ_n=1.50 keV *15*,Γ_γ=4.8 eV *10*, E(n)(lab)=41.40 *8*.
10085.8 *18*	($^+$)	(1)	0.18 *20*	2gΓ_n ≈ 8 eV, E(n)(lab)=41.94 *4*.
10086.2 *18*		≥1		2gΓ_n=0.10 eV *1*, E(n)(lab)=42.35 *4*.
10087.4 *19*		≥1	0.016 *6*	2gΓ_n=0.034 eV *12*, E(n)(lab)=43.58 *4*.
10090.8 *18*	1$^-$	0	0.85 *11*	2gΓ_n=0.68 keV *15* ,Γ_γ=1.14 eV *15*, E(n)(lab)=47.05 *5*.
10093.66 *19*	($^+$)	(1)	0.12 *1*	2gΓ_n=2.9 eV,Γ_γ=0.26 eV *2*, E(n)(lab)=49.93 *5*.
10094.64 *19*		≥1	0.41 *3*	E(n)(lab)=50.92 *5*.
10096.39 *19*		≥1	0.10 *3*	2gΓ_n=0.24 eV *80*, E(n)(lab)=52.70 *5*.
10096.56 *19*	($^-$)	(0)	0.43 *5*	2gΓ_n ≈ 32 eV,Γ_γ=0.88 eV *1*, E(n)(lab)=52.88 *5*.
10099.44 *19*	0$^-$	0	0.6 *2*	2gΓ_n=5.0 keV *8* ,Γ_γ=2.4 eV *8*, E(n)(lab)=55.81 *6*.
10099.80 *19*	($^+$)	(1)	0.38 *4*	2gΓ_n ≈ 6 eV $E(n)(lab)=56.17 *6*.
10102.40 *19*		≥1	0.04 *1*	2gΓ_n=0.08 eV *2*, E(n)(lab)=58.82 *6*.
10102.51 *18*			0.16 *3*	E(n)(lab)=58.93 *2*.
10104.59 *22*	1$^-$	0	1.7 *3*	2gΓ_n=5.6 keV *8* ,Γ_γ=2.27 eV *35*, E(n)(lab)=61.05 *12*.

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^{57}Fe(n,γ),(n,n):resonances 2006MuZX (continued)

^{58}Fe Levels (continued)

E(level)‡	J^{π}†	L	$g\Gamma_n\Gamma_\gamma/\Gamma$ (meV)	Comments
10105.53 *19*		≥1	0.05 *3*	$2g\Gamma_n$=0.10 eV *6*, E(n)(lab)=62.00 *6*.
10105.77 *19*		≥1	0.25 *3*	E(n)(lab)=62.25 *6*.
10106.49 *19*		≥1	0.13 *2*	E(n)(lab)=62.98 *6*.
10107.44 *19*			0.40 *3*	E(n)(lab)=63.95 *6*.
10107.71 *19*		≥1	0.08 *2*	E(n)(lab)=64.22 *6*.
10110.19 *19*		≥1	0.63 *8*	E(n)(lab)=66.75 *7*.
10111.48 *19*		≥1	0.29 *3*	E(n)(lab)=68.07 *7*.
10114.80 *19*		≥1	0.36 *3*	E(n)(lab)=71.45 *7*.
10116.03 *19*		≥1	0.33 *3*	E(n)(lab)=72.70 *7*.
10117.60 *18*			0.10 *3*	E(n)(lab)=74.3.
10120.16 *23*	1^-	0	0.95 *20*	$2g\Gamma_n$=2.9 keV *3* ,Γ_γ=1.27 eV *27*, E(n)(lab)=76.90 *15*.
10123.50 *20*		≥1	0.27 *4*	E(n)(lab)=80.30 *8*.
10126.30 *20*		≥1	0.06 *3*	$2g\Gamma_n$=0.14 eV *6*, E(n)(lab)=83.15 *8*.
10127.60 *20*		≥1	0.22 *4*	E(n)(lab)=84.47 *9*.
10130.32 *20*		≥1	0.05 *2*	$2g\Gamma_n$=0.12 eV *4*, E(n)(lab)=87.24 *9*.
10131.34 *20*		≥1	0.30 *2*	E(n)(lab)=88.28 *9*.
10133.01 *20*			0.21 *3*	E(n)(lab)=89.98 *9*.
10134.35 *20*		≥1	0.05 *3*	$2g\Gamma_n$=0.12 eV *6*, E(n)(lab)=91.34 *9*.
10136.36 *20*			0.72 *15*	E(n)(lab)=93.39 *9*.
10136.67 *20*	1^-	0	0.35 *15*	$2g\Gamma_n$=0.30 keV *8* ,Γ_γ=0.47 eV *20*, E(n)(lab)=93.70 *9*.
10136.93 *20*		≥1	1.0 *2*	E(n)(lab)=93.97 *9*.
10137.65 *20*		≥1	0.24 *2*	E(n)(lab)=94.70 *10*.
10139.22 *20*		≥1	0.76 *6*	E(n)(lab)=96.30 *10*.
10140.99 *20*		≥1	0.06 *2*	$2g\Gamma_n$=0.14 eV *4*, E(n)(lab)=98.10 *9*.
10141.73 *20*		≥1	0.20 *3*	E(n)(lab)=98.85 *10*.
10142.73 *20*			0.18 *3*	E(n)(lab)=99.87 *9*.
10143.94 *20*		≥1	0.42 *4*	E(n)(lab)=101.1 *1*.
10144.63 *20*	$(^+)$	(1)	0.48 *5*	$2g\Gamma_n \approx$ 26 eV, E(n)(lab)=101.8 *1*.
10146.76 *20*		≥1	0.11 *3*	E(n)(lab)=103.97 *10*.
10147.98 *21*		≥1	0.24 *4*	E(n)(lab)=105.21 *11*.
10148.63 *21*		≥1	0.15 *4*	E(n)(lab)=105.87 *11*.
10149.57 *21*		≥1	0.88 *7*	E(n)(lab)=106.83 *11*.
10150.33 *21*		≥1	0.05 *3*	E(n)(lab)=107.60 *11*.
10150.82 *21*		≥1	0.45 *7*	E(n)(lab)=108.10 *11*.
10152.1 *3*	1^-	0	2.3 *11*	$2g\Gamma_n$=3.5 keV *5* ,Γ_γ=3.0 eV *15*, E(n)(lab)=109.40 *21*.
10152.9 *3*	1^-	0	0.8 *4*	$2g\Gamma_n$=1.80 keV *15* ,Γ_γ=1.0 eV *5*, E(n)(lab)=110.20 *11*.
10153.76 *21*		≥1	0.12 *4*	E(n)(lab)=111.10 *11*.
10155.43 *21*		≥1	0.9 *1*	E(n)(lab)=112.80 *11*.
10156.20 *21*		≥1	0.04 *2*	$2g\Gamma_n$=0.08 eV *4*, E(n)(lab)=113.58 *11*.
10157.10 *22*		≥1	0.54 *5*	E(n)(lab)=114.50 *12*.
10161.72 *22*	$(^+)$	(1)	0.38 *4*	$2g\Gamma_n \approx$ 42, E(n)(lab)=119.20 *12*.
10163.98 *22*		≥1	0.35 *4*	E(n)(lab)=121.50 *12*.
10166.44 *22*		≥1	0.18 *3*	E(n)(lab)=124.00 *12*.
10167.4 *3*	1^-	0	1.5 *8*	$2g\Gamma_n$=2.3 keV *3*, E(n)(lab)=125.0 *3*.
10168.4 *3*	0^-	0	0.30 *15*	$2g\Gamma_n$=1.25 keV *25* ,Γ_γ=1.2 eV *6*, E(n)(lab)=126.0 *3*.
10169.09 *22*			0.33 *4*	E(n)(lab)=126.70 *13*.
10171.84 *22*	1^-	0	2.3 *11*	$2g\Gamma_n$=6.3 keV *11*, Γ_γ=3.0 eV *15*, E(n)(lab)=129.50 *13*.
10172.53 *22*		≥1	0.39 *5*	E(n)(lab)=130.20 *13*.
10174.10 *22*		≥1	0.78 *7*	E(n)(lab)=131.80 *13*.
10176.36 *22*		≥1	0.42 *6*	E(n)(lab)=134.10 *13*.
10176.8 *3*	0^-	0	0.95 *25*	$2g\Gamma_n$=1.65 keV *25* ,Γ_γ=3.8 eV *10*, E(n)(lab)=134.5 *3*.
10177.52 *22*		≥1	0.15 *4*	E(n)(lab)=135.28 *13*.
10182.9 *3*	0^-	0	0.57 *2*	$2g\Gamma_n$=2.3 eV *5*,Γ_γ=2.3 eV *8*, E(n)(lab)=140.7 *3*.
10190.81 *23*		≥1	0.48 *7*	E(n)(lab)=148.80 *15*.
10192.23 *23*		≥1	0.15 *4*	E(n)(lab)=150.25 *15*.
10192.68 *23*		≥1	0.40 *6*	E(n)(lab)=150.70 *15*.
10196.87 *23*		≥1	0.15 *4*	E(n)(lab)=154.97 *15*.

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^{57}Fe(n,γ),(n,n):resonances 2006MuZX (continued)

^{58}Fe Levels (continued)

E(level)‡	J^{π}†	L	$g\Gamma_n\Gamma_\gamma/\Gamma$ (meV)	Comments
10200.15 *24*		≥1	0.15 *4*	$2g\Gamma_n$=0.2 eV *2*, E(n)(lab)=158.30 *16*.
10201.72 *24*		≥1	0.40 *6*	E(n)(lab)=159.90 *16*.
10206.53 *25*		≥1	0.08 *5*	$2g\Gamma_n$=0.18 eV *13*, E(n)(lab)=164.80 *17*.
10208.23 *25*		≥1	0.15 *8*	E(n)(lab)=166.53 *17*.
10208.7 *4*	1^-	0	0.1 *6*	$2g\Gamma_n$=1.65 keV *15*, Γ_γ=1.5 eV *8*, E(n)(lab)=167.0 *4*.
10208.99 *25*			0.5 *10*	E(n)(lab)=167.30 *17*.
10210.46 *25*			0.20 *5*	E(n)(lab)=168.80 *17*.
10210.66 *25*	1^-	0	1.5 *8*	$2g\Gamma_n$=2.6 eV *3*,Γ_γ=2 eV *1*, E(n)(lab)=169.00 *17*.
10210.97 *23*		≥1	0.35 *8*	E(n)(lab)=169.31 *15*.
10217.83 *25*	0^-	0		$2g\Gamma_n$=0.35 keV *5* ,Γ_γ=1.2 eV *4*, E(n)(lab)=176.30 *18*.
10221.37 *25*			0.60 *9*	E(n)(lab)=179.90 *18*.
10227.1 *4*	1^-	0	2.3 *11*	$2g\Gamma_n$=5.3 keV *6*,Γ_γ=3.0 eV *15*, E(n)(lab)=185.7 *4*.
10228.15 *3*			0.40 *7*	E(n)(lab)=186.80 *19*.
10230.8 *3*			0.38 *19*	$2g\Gamma_n$=1.60 keV *20*, E(n)(lab)=189.50 *19*.
10234.9 *3*			0.90 *15*	E(n)(lab)=193.70 *19*.
10238.4 *3*			0.65 *20*	E(n)(lab)=197.30 *19*.
10240.0 *3*			0.3 *1*	E(n)(lab)=198.9 *2*.
10241.2 *3*			0.25 *10*	E(n)(lab)=200.1 *2*.

† As given in 2006MuZX evaluation.

‡ S(n)+E(n)(c.m.), where S(n)=10044.60 keV *18* (2009AuZZ,2003Au03), E(n)(c.m.)=(mass(^{57}Fe/[mass(^{57}Fe+mass(neutron)])(E(n)(lab). The multiplicative factor for E(n)(lab) to E(n)(c.m.) is 0.982592; listed E(n)(lab) are in keV.