Coulomb excitation **1981Le02,1979Po16,1979Po08**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 121, 1 (2014)	20-Jun-2014

Additional information 1.

1966Si02: E(^{16}O)=31-41 MeV, measured sigma(E,E(^{16}O′)). see also 1964Ec06.

1967Af03: E(^{12}C)=36.8 MeV, E(^{14}N)=43.3 MeV. Scattering chamber, NaI, coincidences.

1974Hu01, 1972Hu08: E(^{16}O)=38.5 MeV,E(α)=9.5, 12 MeV. Transient-field, implantation PAC technique, measured $\gamma(\theta$,H).

1977Fa07: E(^{16}O)=36 MeV. Coulomb excitation, recoil implant, IMPAC, measured ^{16}O′$\gamma(\theta,\beta)$ in polarized Gd at 80 K °, NaI.

1979Po08: E(^{16}O), E(^{18}O)=30-42 MeV. Double focusing magnetic spectrometer, Si detector, measured σ(E), DWBA, optical model, multistep processes.

1979Po16, 1976Le12: E(^{12}C), E(^{13}C)=16-35 MeV. Double focusing spectrometer, Si detector. Measured σ(E), optical model, DWBA, Coulomb-nuclear interference.

1981Le02: E(^{16}O)=28 MeV, E(^{40}Ca)=86 MeV. Using reorientation effect in Coulomb excitation, measured relative cross section, deduced Q(2^+) and B(E2; 0^+ to 2^+). Q3D spectrometer, 65 cm long detector.

1977Br23, 1977BeZP, 1977HaZW: E(^{32}S)=64-72 MeV. Excite 2^+ state, initial velocity of recoiling ^{54}Fe ions≈0.05 C, measured $\gamma(\theta$,H) in polarized iron.

2000Sp08: C(^{54}Fe,^{54}Fe′γ), E=130 MeV. Measured g-factor using transient-field technique.

2009Ea02: Gd(^{54}Fe,^{54}Fe′γ), E=110 MeV. External magnetic field of 0.09$T_{1/2}$ was applied to magnetize Gd layer of the target. Target=Gd foil of 3.4 mg/cm^2 with a front layer of copper of thickness 0.03 mg/cm^2 and a back copper layer of thickness 6 mg/cm^2 and finally a layer of 0.6 mg/cm^2 thick carbon was added in the front. The target was cooled to ≈5K. The γ rays were measured in coincidence with scattered carbon ions using four HPGe detectors for γ rays and array of three silicon photodiode detectors for carbon ions. particle-γ angular correlations were measured using two NaI(Tl) and two Ge detectors. Measured g-factor using transient-field technique and measured relative to the g-factor of the 847, 2^+ state in ^{56}Fe.

Other measurements: 1964Ec06, 1965Si02, 1973Ch10, 1972WaYZ, 1980Me05.

^{54}Fe Levels

E(level)	J^{π} †	$T_{1/2}$	Comments
0	0^+		
1408 *50*	2^+	0.76 ps *2*	B(E2)↑=0.062 *5* (2001Ra27); g=1.05 *6* (2000Sp08); Q=−0.05 *14* (1981Le02) deformation parameter for the charge distribution (Coulomb): β_2(Coulomb)=0.22 for ^{54}Fe+^{12}C (1979Po16) and for ^{54}Fe+^{16}O (1979Po08), β_2(Coulomb)=0.21 for ^{54}Fe+^{18}O (1979Po08). Deformation parameter for the ion-ion nuclear potential: β_2(nuclear)=0.17 for ^{54}Fe+^{12}C (1979Po16), β_2(nuclear)=0.16 for ^{54}Fe+^{16}O, β_2(nuclear)=0.12 for ^{54}Fe+^{18}O (1979Po08). B(E2)↑: Others: 0.0676 *38* for ^{54}Fe+^{16}O and ^{54}Fe+^{40}Ca (1981Le02), 0.064 *7* for ^{54}Fe+^{16}O (1979Po08), 0.060 *5* for ^{54}Fe+^{18}O (1979Po08), 0.064 *4* for ^{54}Fe+^{12}C and ^{54}Fe+^{13}C (1979Po16), 0.061 *12* for ^{54}Fe+^{12}C (1967Af03); 0.045 (1976Le12), 0.0595 (1971DaZM), 0.051 *2* (1965Si02). g: Others: g=1.08 *19* (1977Fa07), g=1.68 *38* (1977Br23), G=0.95 11 (2009EA02), G=1.43 28 (1972Hu08, 1974Hu01). g(1408,2^+ in ^{54}Fe)/g(847, 2^+ in ^{56}Fe)=1.67 *17* (2009EA02). Using 1.90 *8* (2000Sp08,2000Er06) and 1.67 *17*, 2009Ea02 gave average relative ratio=1.87 *7*. G=+0.95 *11* (2009Ea02) is from average relative ratio and g=+0.509 *105* for ^{56}Fe) (2009Ea01). $T_{1/2}$: From 2000Sp08.
2538	4^+		
2959	2^+		
3166	2^+		

† From Adopted Levels.

Coulomb excitation 1981Le02,1979Po16,1979Po08 (continued)

$\gamma(^{54}Fe)$

E_γ †	E_i(level)	J_i^π	E_f	J_f^π
1130	2538	4^+	1408	2^+
1408	1408	2^+	0	0^+
1551	2959	2^+	1408	2^+
1758	3166	2^+	1408	2^+
2959	2959	2^+	0	0^+
3166	3166	2^+	0	0^+

† From 1981Le02.

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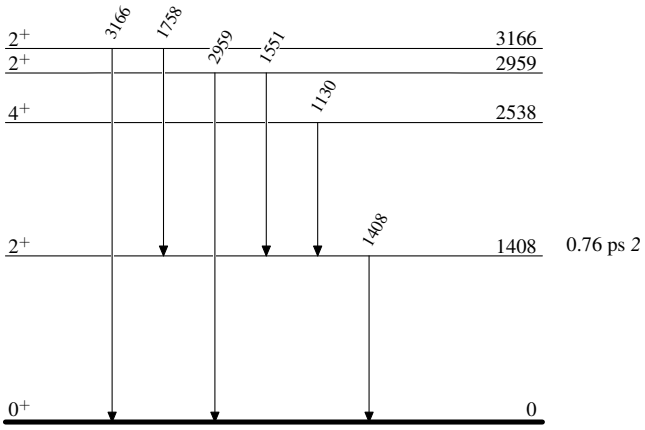
Level Scheme



$^{54}_{26}Fe_{28}$