Coulomb excitation

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

1972Ke16: E(^{16}O)=42 and 47 MeV. Measured $\sigma(\theta)$ for θ=140°−160° in 10° steps and θ=−150° using Enge split-pole spectrograph and three position-sensitive detectors (FWHM=120 keV); Reorientation effect, deduced transition strengths from coupled-channel calculations.

1973Fi15: E(^{35}Cl)=56-68 MeV. Measured Eγ, Iγ using Ge(Li) detector; deduced $T_{1/2}$ using Doppler Shift Attenuation Method.

1980Br01: E(^{32}S)=72-80 MeV. Measured Eγ, Iγ, γ-particle coincidences, $\gamma(\theta$,H) through polarized iron using annular surface-barrier detector for backscattered sulfur ions and four NaI(Tl) detectors; deduced g-factor of first 2^+ state using dynamic field technique.

1984Be20: Eα=10-11 MeV. E(^{16}O)=42-45 MeV. Measured $\sigma(\theta)$ for $\theta(\alpha)$=110°−174.3° and $\theta(^{16}O)$=110°−174.3° using surface barrier detectors (FWHM≈30-40 keV (α) and ≈140-160 keV (^{16}O); reorientation effect, deduced transition strengths using semi-classical coupled channel calculation.

1985Bu01: E(^{12}C)=38-42 MeV. Measured σ(90.0° ± 0.1°) using Enge split-pole spectrograph and position-sensitive, gas-filled proportional counter; deduced transition strengths using Winther-de Boer Coulomb excitation code.

1986BaZJ,1986Ro15: Eα=11-12 MeV (θ≈175°), E(^{7}Li)=15-16 MeV (θ≈171°), E(^{16}O)=45-49 MeV (θ≈175°); ΔE=6-30 keV, $\Delta\theta$=0.2° (semi). Measured $\sigma(\theta)$ using cooled annular silicon surface barrier detector; reorientation effect deduced transition strengths using semi-classical coupled channel calculation.

2002Ra21: Inverse kinematics E(^{136}Ba)=396 MeV on natural C. Measured Eγ, Iγ, particle-γ coincidences using HyBall array of 95 CsI crystals and the CLARION array consisting of 8 HPGe Clover detectors; deduced transition strengths using Winther-de Boer Coulomb excitation code.

Other: 1963Al31.

^{136}Ba Levels

B(E2),Q: sign convention of 1984Be20 used for the interference term arising from direct excitation of the first 2^+ level and the excitation through a higher-lying 2^+ level. Values outside parentheses correspond to constructive interference from 2nd 2^+ while those in parentheses correspond to destructive interference. 1972Ke16 favor the values with a constructive interference term.

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	0^+		
819	2^+	1.89 ps *3*	B(E2)↑=0.407 *7*; g=0.34 *5* (1980Br01) $T_{1/2}$: deduced by evaluator from B(E2) value and Adopted Gamma properties. Other: 2.2 ps *3* (1973Fi15); B(E2)↑: from weighted average of 0.399 *3* (1984Be20), 0.419 *4* (1986Ro15), and 0.418 *11* (1972Ke16). Others: 0.46 *4* (2002Ra21), (0.417 *4*) (1986BaZJ,1986Ro15), 0.388 *10* (0.400 *10*) taking Q=−0.19 *17* (1985Bu01), 0.418 *11* (0.417 *12*) (1972Ke16), 0.53 *16* (1963Al31). g: 0.35 *5* if the linear velocity expression is parameterized differently (1980Br01). Q: −0.19 *6* (+0.07 *7*) (1986BaZJ,1986Ro15), +0.01 *5* (+0.25 *5*) (1984Be20), or −0.19 *17* (+0.02 *18*) (1972Ke16).
1551	2^+	1.08 ps *29*	B(E2)↑=0.016 *4* (1985Bu01) $T_{1/2}$: deduced by evaluator from B(E2) value and Adopted Gamma properties. B(E2)↑: B(E2)(819 → 1551)=0.11 *3* (1985Bu01).
2.13×10^3	2^+		B(E2)↑: no value extracted by 1985Bu01 due to uncertainty in J^π. Value based on an assumed J^π was included in the calculations and found not to significantly effect the B(E2) and B(E3) values of other levels.
2532	3^-		B(E3)↑=0.155 *18* (1985Bu01) B(E3)↑: mean of 40- and 42-MeV data. Assuming Q=0 and taking the strengths of E1 transitions equal to 1.×10^{-4} W.u.

† From 1985Bu01.
‡ From the Adopted Levels, except for 819 level which is from Coulomb excitation.

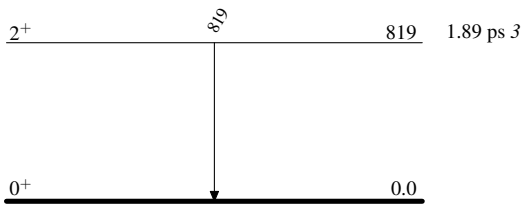
Coulomb excitation (continued)

$\gamma(^{136}Ba)$

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
819	819	2^+	0.0	0^+	Observed in coincidence with scattered ^{32}S (1980Br01) and scattered C (2002Ra21); energy not explicitly given.

Coulomb excitation

Level Scheme



$^{136}_{56}Ba_{80}$