Coulomb excitation

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110, 999 (2009)	1-Nov-2008

p,134$\gamma(\theta)$: isotropic within 2% (1958Mc02).
p,(167γ)(134γ)(θ): δ(134γ)=+0.187 *13*, δ(167γ)=+0.154 *10* (1966As02).
p,167$\gamma(\theta)$: A_2=+0.006 *1*, deduced δ(167γ)=0.176 *6* (1959De29); deduced δ(167γ)=0.16 *4* (1958Mc02).
p,301$\gamma(\theta)$: A_2=+0.12 *6*, deduced 1/δ(301γ)=0 (1959De29).
$\gamma\gamma$: (167γ)(134γ) (1956Go47,1957Wo32,1958Mc02).

^{187}Re(p,p′)	E(p)=2.0 MeV	scin γ 1957Wo32
	E(p)=3-4 MeV	scin γ 1958Mc02
	E(p)=4.0 MeV	scin γ 1959De29
^{187}Re(α,α′)	E(α)=16.6 MeV	s α′ 1967Bi10

Other measurements: 1955Mc44, 1956Da40, 1956Hu49, 1958Ch36, 1969Da17.

^{187}Re Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	Comments
0.0	5/2$^+$		
134.5 *7*	7/2$^+$	11.1 ps *10*	B(E2)↑=1.45 *8* B(E2)↑: weighted average of 1.14 *23* (1957Wo32), 1.47 *15* (1958Mc02), 2.0 *4* (1959De29), and 1.47 *10* (1967Bi10). Other values: 0.6 *3* (1955Mc44), 1.3 (1956Da40), and 1.8 (1956Hu49).
303.0 *7*	(9/2$^+$)	5.2 ps *18*	B(E2)↑=0.57 *3* B(E2)↑: weighted average of 0.63 *4* (1957Wo32), 0.56 *8* (1958Mc02), 0.56 *25* (1959De29), 0.52 *4* (1967Bi10), and 0.6 *2* (1959De29). Other values: 0.45 (1956Da40), 0.4 (1956Go47).
512.0 *10*	1/2$^+$	13[@] ps *3*	B(E2)↑=0.04 *1* B(E2)↑: from 1960Na13, uncertainty estimated by the evaluator.
582.0 *15*	(5/2$^+$)		
589.143[‡] *16*	3/2$^+$		
647.26[‡] *15*	5/2$^+$		
845.0 *10*	(9/2$^+$)	54 fs *34*	B(E2)↑=0.080 *12* B(E2)↑: from 1967Bi10. $T_{1/2}$: Using B(E2)=0.080 *12* and adopted 845γ ray properties, and assumed 639γ has negligible intensity. B(E2)(W.u.)≈1.3×10^5 for the 263γ indicates either substantial unobserved feeding from this level or incorrect branching intensities.
879.5 *7*	(5/2$^+$)	0.17 ps *5*	B(E2)↑=0.16 *5* B(E2)↑: from 1960Na13 assuming branching=0.31, uncertainty estimated by the evaluator.

[†] From a least-squares adjustment using the γ-rays, assuming ΔE=1 keV for all γ-rays.
[‡] From Adopted Levels.
[#] From B(E2) and adopted γ-ray properties.
[@] B(E2)=0.12 *2* for the 512+589+647 levels (1967Bi10).

Coulomb excitation (continued)

$\gamma(^{187}Re)$

E_i(level)	J_i^π	E_γ	I_γ †	E_f	J_f^π	Mult.	δ	α ‡	Comments
134.5	$7/2^+$	134	100	0.0	$5/2^+$	M1+E2	+0.175 *6*	2.20	
303.0	$(9/2^+)$	168	100	134.5	$7/2^+$	M1+E2	+0.168 *7*	1.155	
		303	19 *3*	0.0	$5/2^+$	E2		0.0855	I_γ: weighted average branching intensity from Iγ(301)/Iγ(168)=0.17 *5* (1958Mc02), 0.19 *5* (1956Da40), and 0.22 *5* (1956Go47). Other values: 0.25 (1957Wo32) and 0.18 (1959De29).
512.0	$1/2^+$	512	100	0.0	$5/2^+$	E2		0.0206	
845.0	$(9/2^+)$	263		582.0	$(5/2^+)$				
		845		0.0	$5/2^+$				
879.5	$(5/2^+)$	576	2.2 *4*	303.0	$(9/2^+)$				
		745	100 *2*	134.5	$7/2^+$				
		880	48 *2*	0.0	$5/2^+$	E2		0.0062	

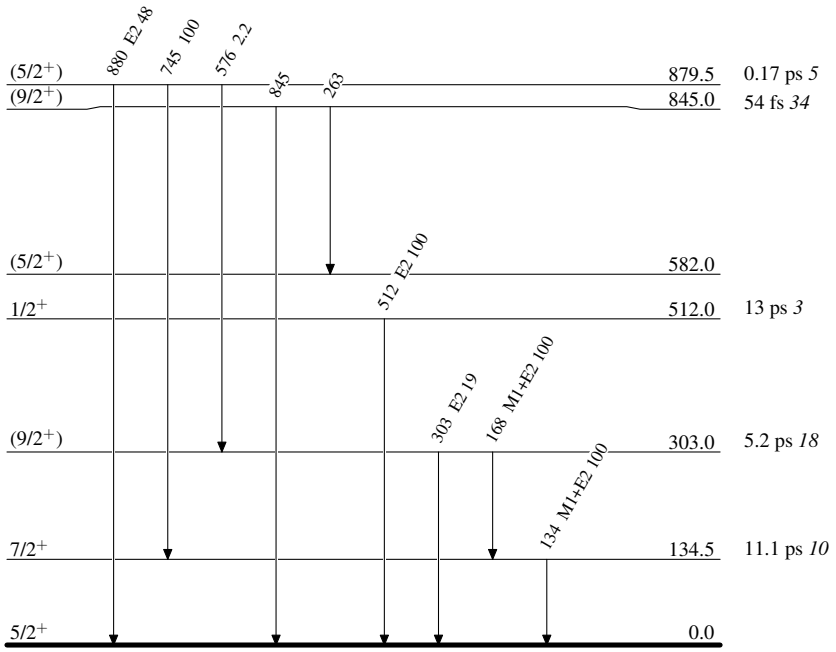
† Relative branching ratio from Adopted Levels, except where noted.

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Coulomb excitation

Level Scheme

Intensities: Relative photon branching from each level



$^{187}_{75}Re_{112}$