Coulomb excitation 1980An22

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 187,1 (2023)	12-Oct-2022

p: E=4.0-5.5 MeV (1980An22).
^{14}N: E=52 MeV (1963Al30,1965Al21).
^{20}Ne: E=28 MeV (1961An09).
Measured: γ (1980An22,1965Al21,1963Al30,1962Ri09,1961An09), $\gamma(\theta)$ (1980An22).
Data from 1980An22 contradict data from other sources. In (p,2nγ) γ from 1580 level to $7/2^+$ 145 level is stronger than γ to $5/2^+$ (g.s.) and is E1. In 1980An22 this γ was not observed at all, while γ to 5/2+(g.s.) is M1+E2 and not expected to be E1. 1980An22 assign $J^\pi=1/2^+$ to the level 1785 and E2 to 1785γ and at the same time observe strong 1639γ from this level to $7/2^+$ 145 level. 1980An22 report M1,E2 1493γ from 1493 level not observed by others. 1980An22 assign M1+E2 to 1348γ and suggest that it depopulates 1348 level, whereas, in (p,2nγ) 1348γ is ΔJ=2, E2 from 1494 level.

^{141}Pr Levels

E(level)	J^π[†]	Comments
0.0	$5/2^+$	
145.5	$7/2^+$	B(E2)=0.0025 *4* (1980An22). Others: 0.0036 *7* (1965Al21,1963Al30,1961An09), ≤0.003 (1962Ri09).
1126.9	$3/2^+$	B(E2)=0.0126 *13* (1980An22). Other: 0.054 *11* (1965Al21).
1292.6	$(5/2)^+$	B(E2)=0.023 *2* (1980An22). Other: 0.049 *10* (1965Al21).
1494	$11/2^+$	1980An22 assign 1493γ to decay from this level.
1580.3	$^+$	B(E2)=0.169 *12* (1980An22).
1608.4	$3/2^+$	B(E2)=0.105 *110* (1980An22). Other: 0.021 *6* (1965Al21).
1785	$(5/2^+)$[‡]	B(E2)=0.140 *21* (1980An22). Other: 0.018 *8* (1965Al21).

[†] From $\gamma(\theta)$ (1980An22), except where noted otherwise.
[‡] Adopted value.

$\gamma(^{141}Pr)$

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
145.5	$7/2^+$	145.5		0.0	$5/2^+$	M1+E2		
1126.9	$3/2^+$	981.7	12 *1*	145.5	$7/2^+$			
		1126.9	88 *1*	0.0	$5/2^+$	M1+E2	+0.47 *6*	Mult.: A_2=+0.215 *13*, δ may also be +4.35 *52*.
1292.6	$(5/2)^+$	1147.3	40 *1*	145.5	$7/2^+$	M1+E2		Mult.: A_2=+0.0150 *109*, δ may be −5.61 *44* or −0.04 *3*.
		1292.6	60 *1*	0.0	$5/2^+$	M1+E2	−1.23 *23*	Mult.: A_2=+0.0844 *91*, δ may also be −2.80 *52*.
1494	$11/2^+$	1348	100	145.5	$7/2^+$			Mult.: A_2=+0.282 *39*. Coul. ex. data on 1348γ favor 1348 level instead of 1494 level (1980An22).
1580.3	$^+$	1580.3	100	0.0	$5/2^+$	M1+E2	−0.030 *6*	Mult.: A_2=+0.0469 *44*, δ may also be −5.27 *99*.
1608.4	$3/2^+$	1608.4	100	0.0	$5/2^+$	M1+E2	+1.17 *35*	Mult.: A_2=+0.298 *45*, δ may also be +1.32 *40*.
1785	$(5/2^+)$	1639	37 *1*	145.5	$7/2^+$			
		1785	63 *1*	0.0	$5/2^+$			Mult.: A_2=+0.0085 *101*.

[†] % photon branching from parent level.
[‡] From $\gamma(\theta)$ with E(p)=5.25 MeV (1980An22).
[#] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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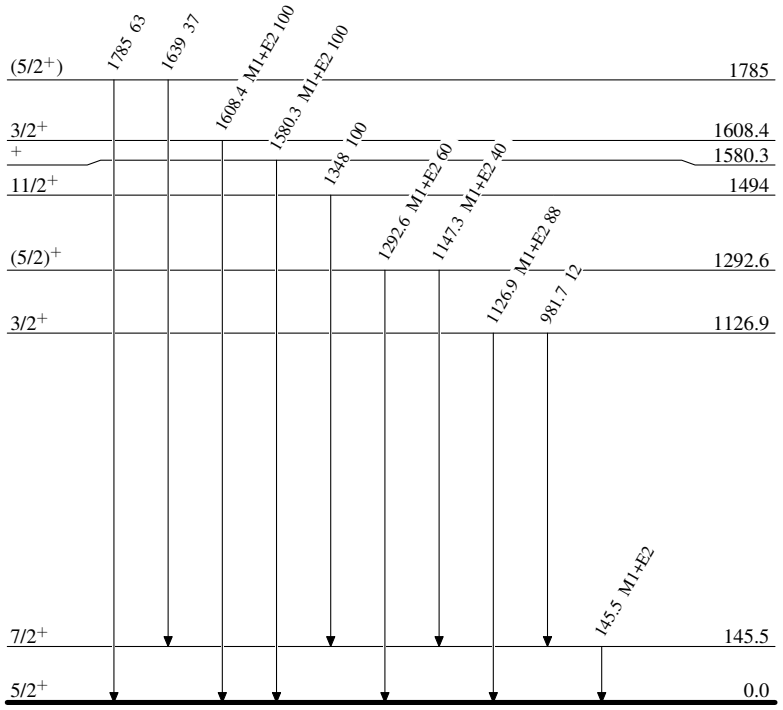
Level Scheme

Intensities: % photon branching from each level



$^{141}_{59}Pr_{82}$