^{130}Pr ε decay:high J + low J 1990Ko25,1988Ba42

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 93, 33 (2001)	11-May-2001

Parent: ^{130}Pr: E=0+x; J^π=HIGH J; $T_{1/2}$=40.0 s *4*; Q(ε)=8091 *SY*; %ε+%$β^+$ decay=100.0

Parent: ^{130}Pr: E=0+y; J^πLOW J; $T_{1/2}$=40.0 s *4*; Q(ε)=8091 *SY*; %ε+%$β^+$ decay=100.0

^{130}Pr(0+y)-$T_{1/2}$: $T_{1/2}$=40.0 s *4* is most likely combined for both high-J and low-J isomers.

1990Ko25 (also 1987Ko24): measured Eγ, Iγ, γγ, $T_{1/2}$.

1988Ba42 (also 1991GiZY): measured Eγ, γγ.

Additional information 1.

1986KuZQ: measured ce for decay of high-spin continuum states.

1997As05: measured (772γ)(254γ)(θ).

1994GiZZ: measured ce.

log *ft*'s cannot be deduced due to incomplete information about Iγ's, large gap (of≈6 MeV) between Q(ε) value and maximum energy level known in this decay, and inability to separate the level scheme from two isomers from available data. 1991GiZY give %ε feedings and associated log *ft* values, but these cannot be valid for reasons given above.

$T_{1/2}$(^{130}Pr isotope): 1977Bo02, 1964PeZY.

^{130}Ce Levels

E(level)	J^π†	Comments
0.0	0^+	
253.72 *16*	2^+	
710.39 *21*	4^+	
834.48 *16*	(2^+)	
1025.5 *11*	0^+	E(level): from 1997As05 and 1987Ko24. Not given in 1990Ko25. J^π: γγ(θ) (1997As05).
1177.32 *21*	$(2^+,3,4^+)$‡	J^π: (3^+) proposed by 1988Ba42.
1322.96 *23*	(4^+)	
1324.4 *3*	6^+	
1671.94 *21*	$(2^+,3,4^+)$‡	J^π: (3,4) proposed by 1988Ba42.
1755.4 *4*	‡	J^π: (5^+) proposed by 1988Ba42.
1899.7 *7*	(6^+)	
1954.5 *4*	(5^-)	
2115.9 *3*	$(2^+,3,4^+)$	
2454 *1*	(7^-)	
2624.2 *4*		

† From Adopted Levels.

‡ Argument is lacking for assignment (listed under comment) proposed by 1988Ba42.

γ(^{130}Ce)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π
253.7 *2*	100 *5*	253.72	2^+	0.0	0^+
283‡@		1954.5	(5^-)	1671.94	$(2^+,3,4^+)$
342.7 *6*	1.0 *3*	1177.32	$(2^+,3,4^+)$	834.48	(2^+)
456.7 *2*	38 *3*	710.39	4^+	253.72	2^+
467.2 *6*	1.3 *4*	1177.32	$(2^+,3,4^+)$	710.39	4^+
488.5 *2*	1.8 *3*	1322.96	(4^+)	834.48	(2^+)
494.7 *2*	2.0 *6*	1671.94	$(2^+,3,4^+)$	1177.32	$(2^+,3,4^+)$
499‡		2454	(7^-)	1954.5	(5^-)

Continued on next page (footnotes at end of table)

^{130}Pr ε decay:high J + low J 1990Ko25,1988Ba42 (continued)

γ(^{130}Ce) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$I_{(\gamma+ce)}$	Comments
574.0‡		1899.7	(6$^+$)	1324.4	6$^+$			
576.7 *6*	1.3 *4*	1899.7	(6$^+$)	1322.96	(4$^+$)			
578.0 *3*	0.4 *1*	1755.4		1177.32	(2$^+$,3,4$^+$)			
580.7 *2*	10.4 *10*	834.48	(2$^+$)	253.72	2$^+$			
612.5 *3*	2.6 *6*	1322.96	(4$^+$)	710.39	4$^+$			
614.0 *2*	6.5 *6*	1324.4	6$^+$	710.39	4$^+$			
631.5# *5*	1.3# *4*	1954.5	(5$^-$)	1322.96	(4$^+$)			
631.5# *5*	1.3# *4*	1954.5	(5$^-$)	1324.4	6$^+$			
771.8		1025.5	0$^+$	253.72	2$^+$			E_γ: from 1987Ko24. γ not given in 1990Ko25. (772γ)(254γ)(θ): A_2=+0.51 *7*, A_4=+1.15 *12* (1997As05).
792‡@		2115.9	(2$^+$,3,4$^+$)	1322.96	(4$^+$)			
834.5 *2*	8.0 *9*	834.48	(2$^+$)	0.0	0$^+$			
837.4 *2*	7.7 *4*	1671.94	(2$^+$,3,4$^+$)	834.48	(2$^+$)			
923.6 *2*	13.8 *10*	1177.32	(2$^+$,3,4$^+$)	253.72	2$^+$			
938.5 *2*	3.4 *7*	2115.9	(2$^+$,3,4$^+$)	1177.32	(2$^+$,3,4$^+$)			
952.3 *3*	5.3 *7*	2624.2		1671.94	(2$^+$,3,4$^+$)			
961.5 *4*	1.7 *6*	1671.94	(2$^+$,3,4$^+$)	710.39	4$^+$			
1025.5		1025.5	0$^+$	0.0	0$^+$	(E0)	0.0039 *12*	E_γ: from level-energy difference. $I_{(\gamma+ce)}$: from 1994GiZZ.
1045.0‡		1755.4		710.39	4$^+$			
1069.4‡		1322.96	(4$^+$)	253.72	2$^+$			
1282‡		2115.9	(2$^+$,3,4$^+$)	834.48	(2$^+$)			
1404.9 *10*	2.9 *9*	2115.9	(2$^+$,3,4$^+$)	710.39	4$^+$			

† From 1990Ko25, unless otherwise stated.
‡ From 1991GiZY (also 1988Ba42) only.
# Multiply placed with undivided intensity.
@ Placement of transition in the level scheme is uncertain.

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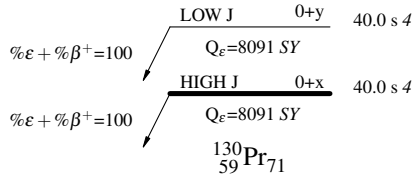
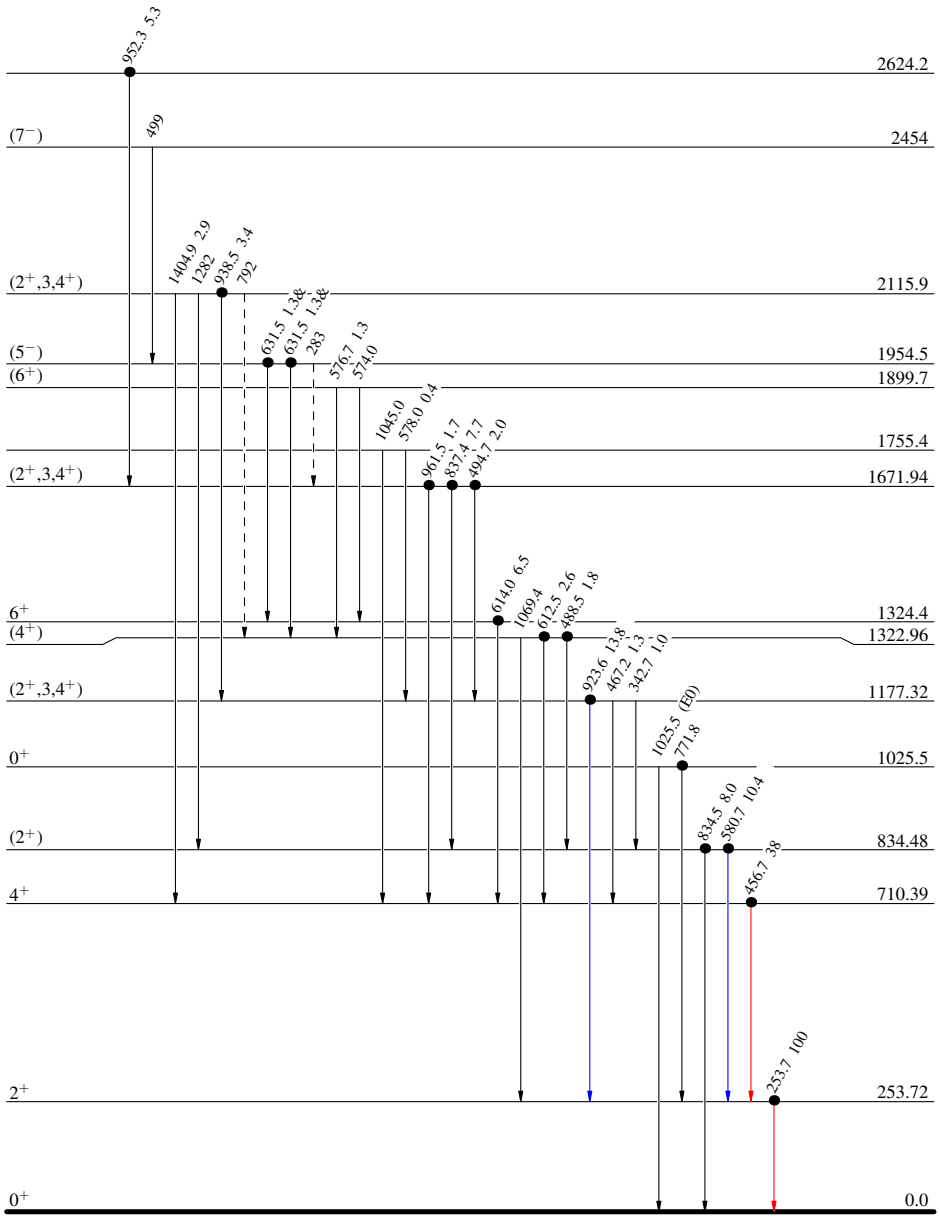
Decay Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence





$^{130}_{58}Ce_{72}$