

**(HI,xnγ) 1993Ac02**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Y. A. Akovali	NDS 77,433 (1996)	1-Feb-1996

<sup>226</sup>Ra(α,4nγ) E=42 MeV; E<sub>γ</sub>, I<sub>γ</sub>, Ice, cey coincidences were measured by 1993Ac02.

The level scheme is presented as constructed by 1993Ac02 from their coincidence data. 1993Ac02 point out that for J≤6, the g.s. and the negative bands show the alternating-parity sequence which is characteristic of reflection-asymmetric nuclear shapes. The authors also point out that the displacement energy between the positive and negative bands approaches smoothly to zero for higher spins, suggesting a stable octupole deformation. See 1993Ac02 for discussions.

The ratios of intrinsic electric dipole and quadrupole moments, D(0)/Q(0), were deduced from the intensity ratios of E1/E2 transitions deexciting g.s. band and the octupole band. This ratio was found to be independent of spin from J<sup>π</sup>=8<sup>+</sup> to J<sup>π</sup>=19<sup>-</sup>. From the constant value of D(0)/Q(0) ratio, 1993Ac02 infer that the octupole deformation does not vary much with J above J>7.

<sup>226</sup>Th Levels

E(level)	J <sup>π</sup>	E(level)	J <sup>π</sup>	E(level)	J <sup>π</sup>	E(level)	J <sup>π</sup>
0.0 <sup>†</sup>	0 <sup>+</sup>	450.5 <sup>‡</sup> 2	5 <sup>-</sup>	1395.2 <sup>†</sup> 4	12 <sup>+</sup>	2635.1 <sup>†</sup> 7	18 <sup>+</sup>
72.20 <sup>†</sup> 4	2 <sup>+</sup>	657.9 <sup>‡</sup> 2	7 <sup>-</sup>	1596.0 <sup>‡</sup> 5	13 <sup>-</sup>	2861.1 <sup>‡</sup> 7	19 <sup>-</sup>
226.43 <sup>†</sup> 5	4 <sup>+</sup>	721.9 <sup>†</sup> 2	8 <sup>+</sup>	1781.5 <sup>†</sup> 5	14 <sup>+</sup>	3097.1 <sup>†</sup> 8	20 <sup>+</sup>
230.37 <sup>‡</sup> 5	1 <sup>-</sup>	923.1 <sup>‡</sup> 3	9 <sup>-</sup>	1989.4 <sup>‡</sup> 5	15 <sup>-</sup>		
307.5 <sup>‡</sup> 2	3 <sup>-</sup>	1040.3 <sup>†</sup> 3	10 <sup>+</sup>	2195.8 <sup>†</sup> 6	16 <sup>+</sup>		
447.3 <sup>†</sup> 2	6 <sup>+</sup>	1238.4 <sup>‡</sup> 4	11 <sup>-</sup>	2412.8 <sup>‡</sup> 6	17 <sup>-</sup>		

<sup>†</sup> Band(A): 0<sup>+</sup> g.s. band.  
<sup>‡</sup> Band(B): 0<sup>-</sup> octupole band.

γ(<sup>226</sup>Th)

E(S),M(S) From <sup>230</sup>U α decay.

E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>γ</sub> <sup>†</sup>	I <sub>γ</sub> <sup>‡</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult. #
72.20	2 <sup>+</sup>	(72.20 4)		0.0	0 <sup>+</sup>	E2
226.43	4 <sup>+</sup>	154.2 1		72.20	2 <sup>+</sup>	(E2)
230.37	1 <sup>-</sup>	(158.18 3)		72.20	2 <sup>+</sup>	E1
		(230.37 5)		0.0	0 <sup>+</sup>	E1
307.5	3 <sup>-</sup>	(81.0 5)		226.43	4 <sup>+</sup>	[E1]
		235.2 1		72.20	2 <sup>+</sup>	[E1]
447.3	6 <sup>+</sup>	220.9 1		226.43	4 <sup>+</sup>	[E2]
450.5	5 <sup>-</sup>	224.2 1		226.43	4 <sup>+</sup>	[E1]
657.9	7 <sup>-</sup>	207.4 1		450.5	5 <sup>-</sup>	[E2]
		210.7 1		447.3	6 <sup>+</sup>	[E1]
721.9	8 <sup>+</sup>	63.9 1	0.13 5	657.9	7 <sup>-</sup>	[E1]
		274.6 1	1.0	447.3	6 <sup>+</sup>	[E2]
923.1	9 <sup>-</sup>	201.3 1	4.0 4	721.9	8 <sup>+</sup>	[E1]
		265.2 1	1.0	657.9	7 <sup>-</sup>	[E2]
1040.3	10 <sup>+</sup>	116.9 2	0.276 21	923.1	9 <sup>-</sup>	[E1]
		318.4 2	1.0	721.9	8 <sup>+</sup>	[E2]
1238.4	11 <sup>-</sup>	198.2 2	1.61 12	1040.3	10 <sup>+</sup>	[E1]
		315.2 2	1.0	923.1	9 <sup>-</sup>	[E2]
1395.2	12 <sup>+</sup>	156.7 2	0.42 3	1238.4	11 <sup>-</sup>	[E1]
		354.9 2	1.0	1040.3	10 <sup>+</sup>	[E2]

Continued on next page (footnotes at end of table)

**(HI,xn $\gamma$ ) 1993Ac02 (continued)** $\gamma(^{226}\text{Th})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	$E_f$	$J_f^\pi$	Mult. <sup>#</sup>
1596.0	13 <sup>-</sup>	200.9 2		1395.2	12 <sup>+</sup>	[E1]
		357.6 2		1238.4	11 <sup>-</sup>	[E2]
1781.5	14 <sup>+</sup>	185.5 2	0.40 4	1596.0	13 <sup>-</sup>	[E1]
		386.3 2	1.0	1395.2	12 <sup>+</sup>	[E2]
1989.4	15 <sup>-</sup>	208.0 2	0.61 10	1781.5	14 <sup>+</sup>	[E1]
		393.4 2	1.0	1596.0	13 <sup>-</sup>	[E2]
2195.8	16 <sup>+</sup>	206.3 3		1989.4	15 <sup>-</sup>	[E1]
		414.3 3		1781.5	14 <sup>+</sup>	[E2]
2412.8	17 <sup>-</sup>	216.9 3	0.43 7	2195.8	16 <sup>+</sup>	[E1]
		423.5 3	1.0	1989.4	15 <sup>-</sup>	[E2]
2635.1	18 <sup>+</sup>	439.3 3		2195.8	16 <sup>+</sup>	
2861.1	19 <sup>-</sup>	226.0 3	0.42 10	2635.1	18 <sup>+</sup>	[E1]
		448.3 3	1.0	2412.8	17 <sup>-</sup>	[E2]
3097.1	20 <sup>+</sup>	462.0 3		2635.1	18 <sup>+</sup>	[E2]

<sup>†</sup> Some low-energy gammas which were not observed by 1993Ac02 are from the  $^{230}\text{U}$   $\alpha$  decay, as indicated. All others are measurement of 1993Ac02. The authors assign the uncertainties as 0.1 keV for the transitions between the lower levels and up to 0.3 keV for the transitions between the higher levels.

<sup>‡</sup> Relative  $\gamma$  branching from levels, as given by 1993Ac02.

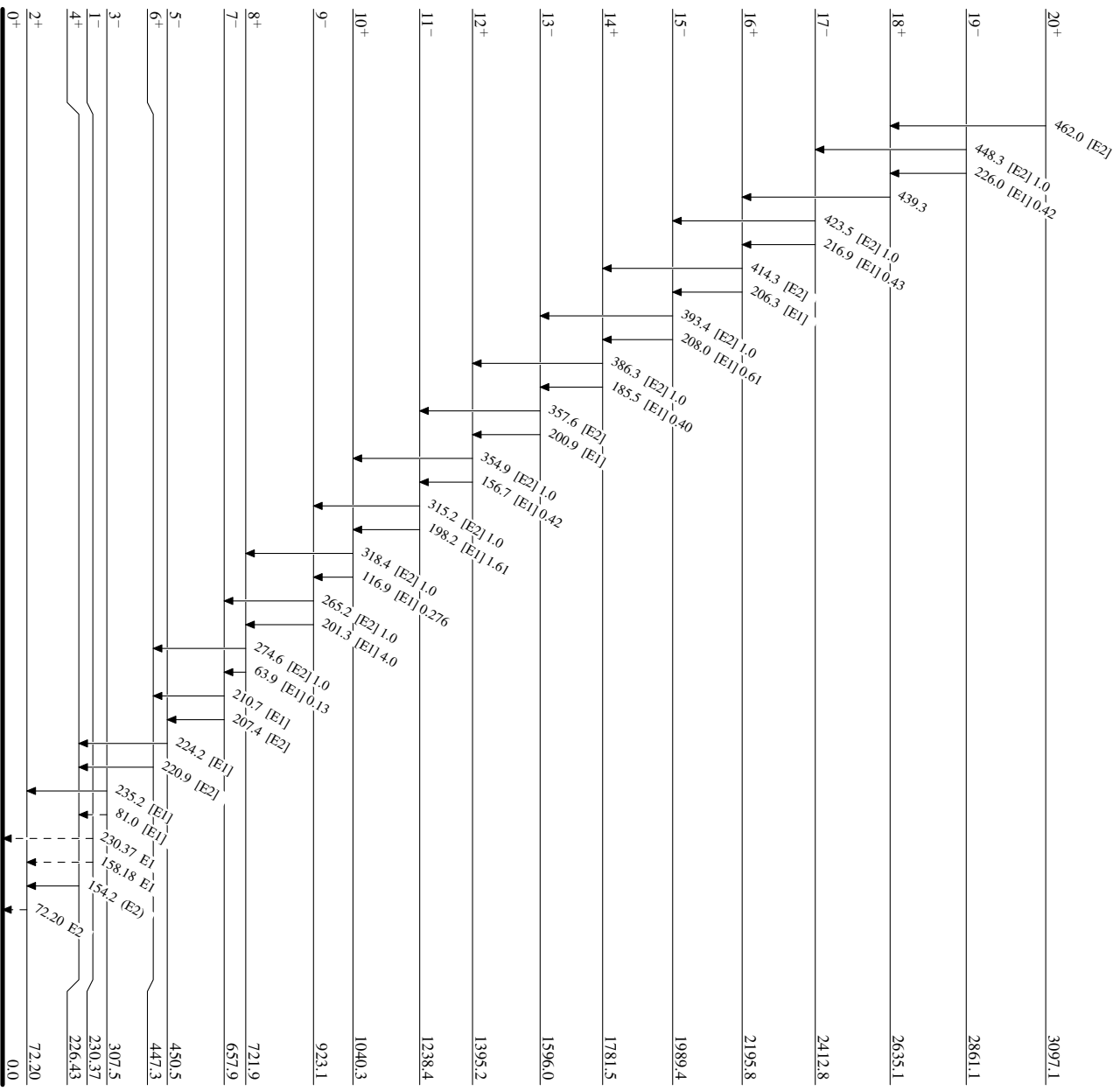
<sup>#</sup> The ce data and the multiplicities deduced from their ce data were not given in 1993Ac02. All multiplicities, except those determined in  $^{230}\text{U}$   $\alpha$  decay, are given in square brackets, indicating that they are from the level scheme, although some of them must have been experimentally verified.

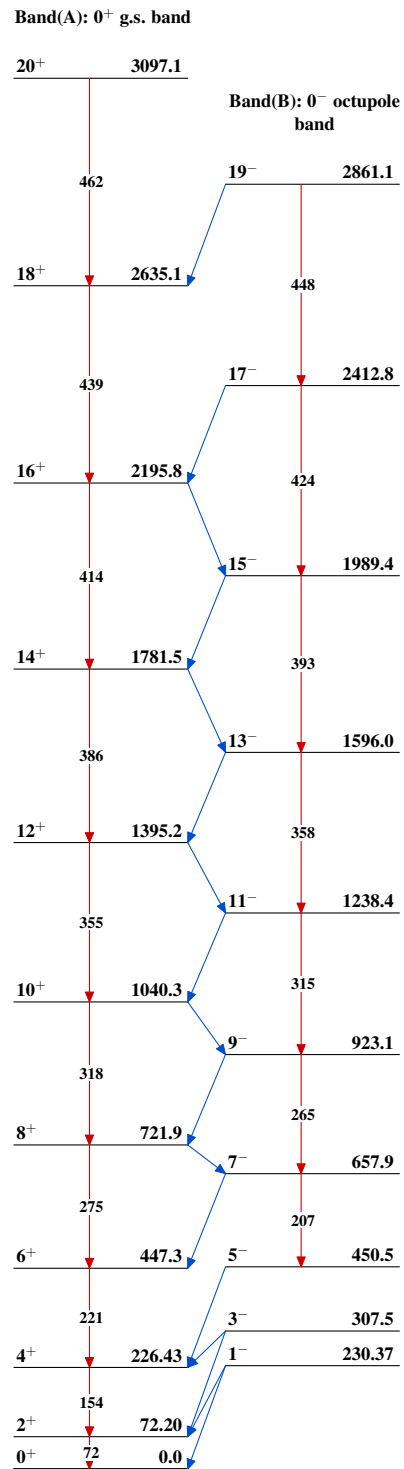
**(HI,xn $\gamma$ ) 1993Ac02**

Legend

## Level Scheme

Intensities: Relative photon branching from each level

----- $\blacktriangleright$   $\gamma$  Decay (Uncertain) $^{226}\text{Th}_{136}$

**(HI,xn $\gamma$ ) 1993Ac02** ${}^{226}_{90}\text{Th}_{136}$