^{131}Te IT decay (93 ms) 1998FoZY,1998Zh09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, I. Mitropolsky, A. Rodionov	NDS 107, 2715 (2006)	17-Jul-2006

Parent: ^{131}Te: E=1940.0 *4*; J^π=(23/2$^+$); $T_{1/2}$=93 ms *12*; %IT decay=?

1998FoZY: ^{233,235,238}U(n,F)^{131}Te E=th; measured γ, β, ce, $T_{1/2}$ and various coincidences. OSIRIS mass separator.

1998Zh09: ^{130}Te(^{64}Ni,^{63}Ni) E=275 MeV; measured $\gamma(^{63}Ni)\gamma\gamma$ prompt and delayed coin deduced ^{131}Te levels, $T_{1/2}$. Tandem, multidetector (40 Ge detectors), pulsed beam (200 ns between pulses) and off-beam measurements.

Comments to experimental results of 1998FoZY were communicated per e-mail reply (to enquiry by Yu. Khazov) by one of the authors of (B. Fogelberg) (Dec. 07/2004).

1998FoZY found 360.3, 564.7 and 832.73 mutually coincident γ's, α(K) equal to 0.08(2), 0.006(2) and 0.0025(8), respectively, and deduced that 360.3 keV is M2+E3 or E3 (not M1 as suggested in 1998Zh09), 564.7 and 832.7 are both M1 or E2. As far as M4 cross-over transition between 1940 and 1015 levels was not seen the spin of 13/2 is more reliable for 1015.9 state but not 15/2 as in 1998Zh09. The maximum spin difference between 1940 keV and 182 keV, J^π=11/2$^-$ levels is 7 units. The highest spin of the expected level at about 2 MeV excitation is 23/2$^+$ for supposed Configuration=$\nu h^2_{11/2}\otimes(7^-$ ^{130}Te core). Due to above reasons the level scheme suggested in 1998Zh09 was not used but the level scheme of 1998FoZY was adopted.

^{131}Te Levels

E(level)[†‡]	J^π	$T_{1/2}$	Comments
0.0	3/2$^+$	25.0[‡] min *1*	
182.265 *18*	11/2$^-$	33.25[‡] h *25*	
1014.95 *20*	(13/2$^-$)		Configuration=$\nu h_{11/2}\otimes(2^+$ ^{130}Te core) from 1998FoZY.
1579.7 *3*	(17/2$^-$)	71 ps *20*	Configuration=$\nu h_{11/2}\otimes(4^+$ ^{130}Te core) from 1998FoZY. $T_{1/2}$: from 1998FoZY.
1940.0 *4*	(23/2$^+$)	93 ms *12*	Configuration=$\nu h^2_{11/2}\otimes(7^-$ ^{130}Te core) (1998FoZY), also =$\nu h^2_{11/2}d_{3/2}$ (1998Zh09). $T_{1/2}$: from 1998FoZY. $T_{1/2}>1$ μs from 1998Zh09.

[†] From least-squares fit to Eγ's.
[‡] From Adopted Levels, gammas.

$\gamma(^{131}Te)$

$\Delta E\gamma'$s were assumed (by evaluators) as 0.2 keV.
α(K)exp values from e-mail of B. Fogelberg (see in general comments).

E_γ[†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[#]	Comments
182.25[‡] *2*	100	182.265	11/2$^-$	0.0	3/2$^+$	(M4)[‡]	25.2	α(K)=17.07 *24*; α(L)=6.45 *9*; α(M)=1.427 *20*; α(N+..)=0.303 *5* α(N)=0.277 *4*; α(O)=0.0260 *4*
360.3 *2*	90	1940.0	(23/2$^+$)	1579.7	(17/2$^-$)	E3	0.0720	α(K)exp=0.08 *2* α(K)=0.0559 *17*; α(L)=0.0129 *4*; α(M)=0.00267 *8*; α(N+..)=0.00062 *2* Mult.: from α(K)exp; according to B.Fogelberg's e-mail, preferably, mult=E3 as BE3W=0.0152 20 and BM2W=2.0E−6 3.
564.7 *2*	99	1579.7	(17/2$^-$)	1014.95	(13/2$^-$)	E2	0.0064 *6*	α(K)exp=0.006 *2* α(K)=0.0055 *6*; α(L)=0.00071 *4*; α(M)=0.000143 *7*; α(N+..)=3.11×10^{-5} *17* α(N)=2.81×10^{-5} *15*; α(O)=3.01×10^{-6} *22* α(N)=2.67×10^{-5} *4*; α(O)=2.79×10^{-6} *4*

Continued on next page (footnotes at end of table)

^{131}Te IT decay (93 ms) 1998FoZY,1998Zh09 (continued)

γ(^{131}Te) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α [#]	Comments
832.7 *2*	100	1014.95	(13/2$^-$)	182.265	11/2$^-$	M1,E2	0.0025 *3*	Mult.: from α(K)exp; according to B.Fogelberg's e-mail, preferably, mult=E2 as BE2W=3.5 *10* and BM1W=0.0017 *5*. α(K)exp=0.0025 *8* α(K)=0.0022 *3*; α(L)=0.00027 *3*; α(M)=5.3×10^{-5} *6*; α(N+..)=1.17×10^{-5} *12* α(N)=1.06×10^{-5} *11*; α(O)=1.14×10^{-6} *13*

† From 1998FoZY.
‡ From Adopted Levels, gammas.
# 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.

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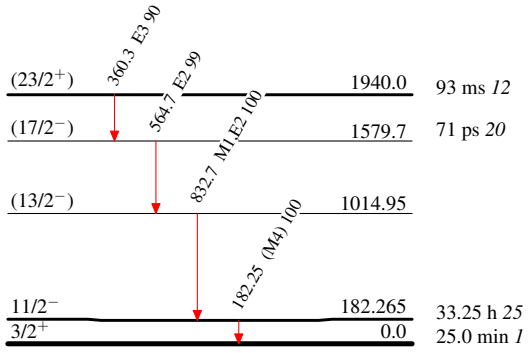
Decay Scheme

Intensities: Relative I_γ
%IT=?

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{131}_{52}Te_{79}$