^{126}Te(^{40}Ca,5nγ) 1988Hu05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Dec-2014

1988Hu05: the reaction is ^{126}Te(^{40}Ca,5nγ), with E(^{40}Ca)=195 MeV. Targets were foils of ^{126}Te, 0.44 mg/cm^2 thick evaporated on 0.37 mg/cm^2 Au backings (which faced the beam). The γ radiation was measured using an array of 21 Compton-suppressed Ge detectors. Measured Eγ, Iγ, triple and higher-fold coincidences, and $\gamma(\theta)$ at two angles.

^{161}Hf Levels

Band 2 in figure 2 of 2014Ma91 seems populated in the work of 1988Hu05 as well, since there several unplaced γ rays may belong to 802-709-647-566-487-472-430 γ cascade in this band.

E(level)[†]	J$^\pi$[‡]	Comments
0+x	(13/2$^+$)	Additional information 1. E(level): x=329.0 in Adopted Levels.
333.1+x *3*	(17/2$^+$)	
808.8+x *5*	(21/2$^+$)	
1369.1+x *6*	(25/2$^+$)	
1995.7+x *6*	(29/2$^+$)	
2416.2+x *12*	(27/2$^-$)	E(level): level is not shown in authors′ level scheme, but is indicated in their table.
2673.5+x *7*	(33/2$^+$)	
2767.3+x *8*	(31/2$^-$)	
3317.1+x *10*	(35/2$^-$)	
3402.4+x *8*	(37/2$^+$)	
3950.5+x *11*	(39/2$^-$)	
4191.7+x *8*	(41/2$^+$)	
4653.5+x *15*	(43/2$^-$)	
4947.0+x *10*	(45/2$^+$)	
5682.6+x *14*	(49/2$^+$)	
6425.6+x? *17*	(53/2$^+$)	

[†] From Eγ data.

[‡] Values assigned by the authors on the basis of angular-correlation ratios, as well as considerations of systematics. This latter basis includes the fact that the prominent transitions strongly populated form a cascade of stretched E2 transitions and, as is observed in the neighboring nuclides, are most likely based on a 13/2$^+$ state.

γ(^{161}Hf)

R=Iγ(30°)/Iγ(80°).

The angular-correlation ratios (R=Iγ(30°)/Iγ(80°)) are given for most γ rays and can be used to distinguish between stretched E2 and dipole transitions. Values close to unity are indicative of stretched quadrupoles, while those close to 0.6 represent stretched dipoles.

E$_\gamma$[‡]	I$_\gamma$[#]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	Comments
333.1 *3*	92 *5*	333.1+x	(17/2$^+$)	0+x	(13/2$^+$)	Q	R=0.99.
x416.9 *10*	5.8 *12*						
x429.8@ *5*	10.8 *11*						R=1.18 *25*.
x472.9@ *5*	14.8 *15*						R=0.90 *16*.
475.7 *3*	100 *5*	808.8+x	(21/2$^+$)	333.1+x	(17/2$^+$)	Q	R=1.04 *3*.
x487.5@ *5*	13.3 *13*						R=2.04 *50*.

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^{126}Te(^{40}Ca,5nγ) 1988Hu05 (continued)

$\gamma(^{161}Hf)$ (continued)

E_γ ‡	I_γ #	E_i(level)	J_i^π	E_f	J_f^π	Mult. †	Comments
549.8 *5*	14.4 *14*	3317.1+x	(35/2$^-$)	2767.3+x	(31/2$^-$)	(Q)	R=0.68 *13*. E_γ,I_γ: multiple line (1988Hu05). Mult.: the angular-correlation ratio suggests a dipole transition, but the placement requires ΔJ=2, quadrupole.
560.3 *3*	102 *5*	1369.1+x	(25/2$^+$)	808.8+x	(21/2$^+$)	Q	R=1.06 *13*.
x562.8 *5*	19.5 *20*						R=0.74 *13*.
x565.3@ *10*							R=0.93 *13*. Value includes contribution from the 567 γ. I_γ: Iγ(565+567)=21.4.
x567.3 *10*							R=0.93 *13*. Value includes contribution from the 565 γ. I_γ: Iγ(565+567)=21.4.
626.6 *3*	75 *4*	1995.7+x	(29/2$^+$)	1369.1+x	(25/2$^+$)	Q	R=1.10 *7*.
633.4 *5*	13.9 *14*	3950.5+x	(39/2$^-$)	3317.1+x	(35/2$^-$)	Q	R=1.45 *20*.
x647.2@ *5*	15.9 *16*						R=1.09 *9*.
677.8 *3*	53 *3*	2673.5+x	(33/2$^+$)	1995.7+x	(29/2$^+$)	Q	R=1.02 *14*.
703.0 *10*	9.0 *18*	4653.5+x	(43/2$^-$)	3950.5+x	(39/2$^-$)		
x708.9@ *5*	10.8 *11*						R=0.85 *20*.
728.9 *3*	31.7 *16*	3402.4+x	(37/2$^+$)	2673.5+x	(33/2$^+$)	Q	R=1.23 *14*.
735.6 *10*	6.1 *12*	5682.6+x	(49/2$^+$)	4947.0+x	(45/2$^+$)	Q	R=0.86 *14*.
743.0& *10*		6425.6+x?	(53/2$^+$)	5682.6+x	(49/2$^+$)		
755.3 *5*	13.4 *13*	4947.0+x	(45/2$^+$)	4191.7+x	(41/2$^+$)	(Q)	R=0.77 *18*. Mult.: the angular-correlation ratio suggests a dipole transition, but the placement requires ΔJ=2, quadrupole.
771.6 *5*	11.6 *12*	2767.3+x	(31/2$^-$)	1995.7+x	(29/2$^+$)	D	R=0.35 *10*.
789.3 *3*	23.2 *12*	4191.7+x	(41/2$^+$)	3402.4+x	(37/2$^+$)	Q	R=0.93 *14*.
x800.7 *10*	5.7 *11*						
x802.7@ *10*	6.0 *12*						
x845.0 *10*	7.5 *15*						R=1.30 *40*.
1047.1 *10*	4.4 *9*	2416.2+x	(27/2$^-$)	1369.1+x	(25/2$^+$)	D	R=0.38 *30*. E_γ: placement is not shown in authors′ level scheme, but is indicated in their table.

† Values inferred by the evaluator from the angular-correlation ratios given by 1988Hu05. It is expected that the quadrupole transitions are E2. Being of high energy, the stretched dipoles are most likely E1.

‡ Uncertainties range from 0.3 keV for strong single peaks up to 1.0 keV for weak peaks and doublets (1988Hu05). Following are assigned by the evaluator: 0.3 keV for Iγ>20, 0.5 keV for Iγ=10-15 and 1 keV for Iγ<10 and doublets.

Uncertainties are between 5% and 20% (1988Hu05). Following are assigned by the evaluator: 5% for Iγ>20, 10% for Iγ=10-15 and 20% for Iγ<10 and doublets.

@ Comparison to level scheme in 2014Ma91 shows that this γ most likely belongs to 802-709-647-566-487-472-430 γ cascade in band 2 shown in figure 2 of 2014Ma91.

& Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

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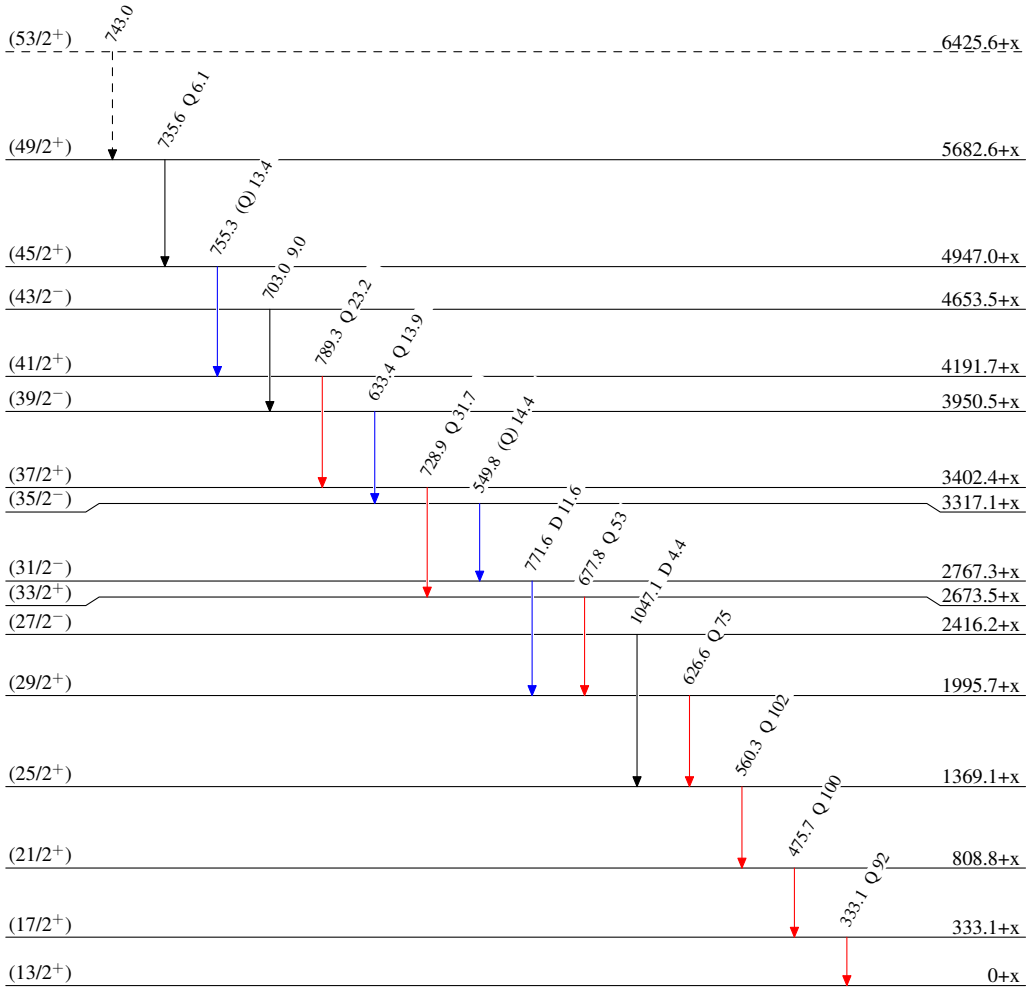
Level Scheme

Intensities: Relative I_γ

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)



$^{161}_{72}Hf_{89}$