

$^{176}\text{Yb}(^{30}\text{Si},\text{F}\gamma)$ 1998Ku22,1999Ho25,2012St13

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev		NDS 137, 1 (2016)	31-May-2016

1998Ku22: $^{176}\text{Yb}(^{28}\text{Si},\text{F}\gamma)$ and $^{176}\text{Yb}(^{30}\text{Si},\text{F}\gamma)$ $E=145$ MeV ^{28}Si , ^{30}Si beam was produced from the Vivitron accelerator at Strasbourg. Target was a 1.5 mg/cm^2 ^{176}Yb on a 15 mg/cm^2 Au backing. γ rays were detected with the EUROGAM2 array of 54 Compton suppressed HPGe detectors. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$. Deduced levels, band structures.

1999Ho25: $^{238}\text{U}(^{12}\text{C},\text{F}\gamma)$ $E=90$ MeV ^{12}C beam was produced from the INFN tandem at Legnaro, Italy. Target was a 47 mg/cm^2 thick ^{238}U . γ rays were detected with the Euroball III array of 15 clusters, 26 clovers and 30 tapered Ge detectors. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$. Deduced levels, band structures.

2012St13: $^{168}\text{Er}(^{30}\text{Si},\text{F}\gamma)$ $E=142$ MeV ^{30}Si beam was produced the XTU tandem accelerator at the Legnaro National Laboratory. Target was a 1.15 mg/cm^2 ^{168}Er foil evaporated on a 9 mg/cm^2 Au backing. γ rays were detected with the EUROBALL III array. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$. Deduced levels, band structures.

 ^{109}Pd Levels

$E(\text{level})^\dagger$	$J^\pi^\ddagger$	$E(\text{level})^\dagger$	$J^\pi^\ddagger$	$E(\text{level})^\dagger$	$J^\pi^\ddagger$	$E(\text{level})^\dagger$	$J^\pi^\ddagger$
0 ^a	5/2 ⁺ #	625 [@] 1	(15/2 ⁻)	1361 ^{&} 1	(17/2 ⁻)	2364.0 ^b 17	(19/2 ⁺)
189 [@]	11/2 ⁻ #	718 ^{&} 1	(13/2 ⁻)	1635.0 ^b 14	(15/2 ⁺)	2479.0 ^a 18	(21/2 ⁺)
276.0 ^b 8	7/2 ⁺ #	907.0 ^b 10	(11/2 ⁺)	1873.0 ^a 15	(17/2 ⁺)	3030 [@] 1	(27/2 ⁻)
287 ^{&} 1	9/2 ⁻	1267.0 ^a 11	(13/2 ⁺)	2103 [@] 1	(23/2 ⁻)	3975 [@] 1	(31/2 ⁻)
597.0 ^a 8	(9/2 ⁺)	1289 [@] 1	(19/2 ⁻)	2155 ^{&} 1	(21/2 ⁻)	4958 [@] 1	(35/2 ⁻)

[†] From a least-squares fit to $E\gamma$.

[‡] Based on the systematics and observed band structures, unless otherwise noted.

From Adopted Levels.

@ Band(A): Most likely the $\nu 3/2^- [541]$ ($h_{11/2}$), $\alpha=-1/2$ band.

& Band(B): Most likely the $\nu 3/2^- [541]$ ($h_{11/2}$), $\alpha=+1/2$ band.

^a Band(C): $K^\pi=5/2^+$ band, $\alpha=+1/2$. Most likely a mixture between $\nu 5/2^+ [413]$ and $\nu 5/2^+ [402]$ Nilsson configurations.

^b Band(D): $K^\pi=5/2^+$ band, $\alpha=-1/2$. Most likely a mixture between $\nu 5/2^+ [413]$ and $\nu 5/2^+ [402]$ Nilsson configurations.

 $\gamma(^{109}\text{Pd})$

$E_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	$E_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
98 1	287	9/2 ⁻	189	11/2 ⁻	643 1	1361	(17/2 ⁻)	718	(13/2 ⁻)
276 1	276.0	7/2 ⁺	0	5/2 ⁺	664 1	1289	(19/2 ⁻)	625	(15/2 ⁻)
310 1	907.0	(11/2 ⁺)	597.0	(9/2 ⁺)	670 1	1267.0	(13/2 ⁺)	597.0	(9/2 ⁺)
321 1	597.0	(9/2 ⁺)	276.0	7/2 ⁺	728 1	1635.0	(15/2 ⁺)	907.0	(11/2 ⁺)
360 1	1267.0	(13/2 ⁺)	907.0	(11/2 ⁺)	729 1	2364.0	(19/2 ⁺)	1635.0	(15/2 ⁺)
431 1	718	(13/2 ⁻)	287	9/2 ⁻	736 1	1361	(17/2 ⁻)	625	(15/2 ⁻)
436 1	625	(15/2 ⁻)	189	11/2 ⁻	794 1	2155	(21/2 ⁻)	1361	(17/2 ⁻)
529 [‡] 1	718	(13/2 ⁻)	189	11/2 ⁻	814 1	2103	(23/2 ⁻)	1289	(19/2 ⁻)
597 1	597.0	(9/2 ⁺)	0	5/2 ⁺	927 1	3030	(27/2 ⁻)	2103	(23/2 ⁻)
605 1	2479.0	(21/2 ⁺)	1873.0	(17/2 ⁺)	945 1	3975	(31/2 ⁻)	3030	(27/2 ⁻)
606 1	1873.0	(17/2 ⁺)	1267.0	(13/2 ⁺)	983 1	4958	(35/2 ⁻)	3975	(31/2 ⁻)
631 1	907.0	(11/2 ⁺)	276.0	7/2 ⁺					

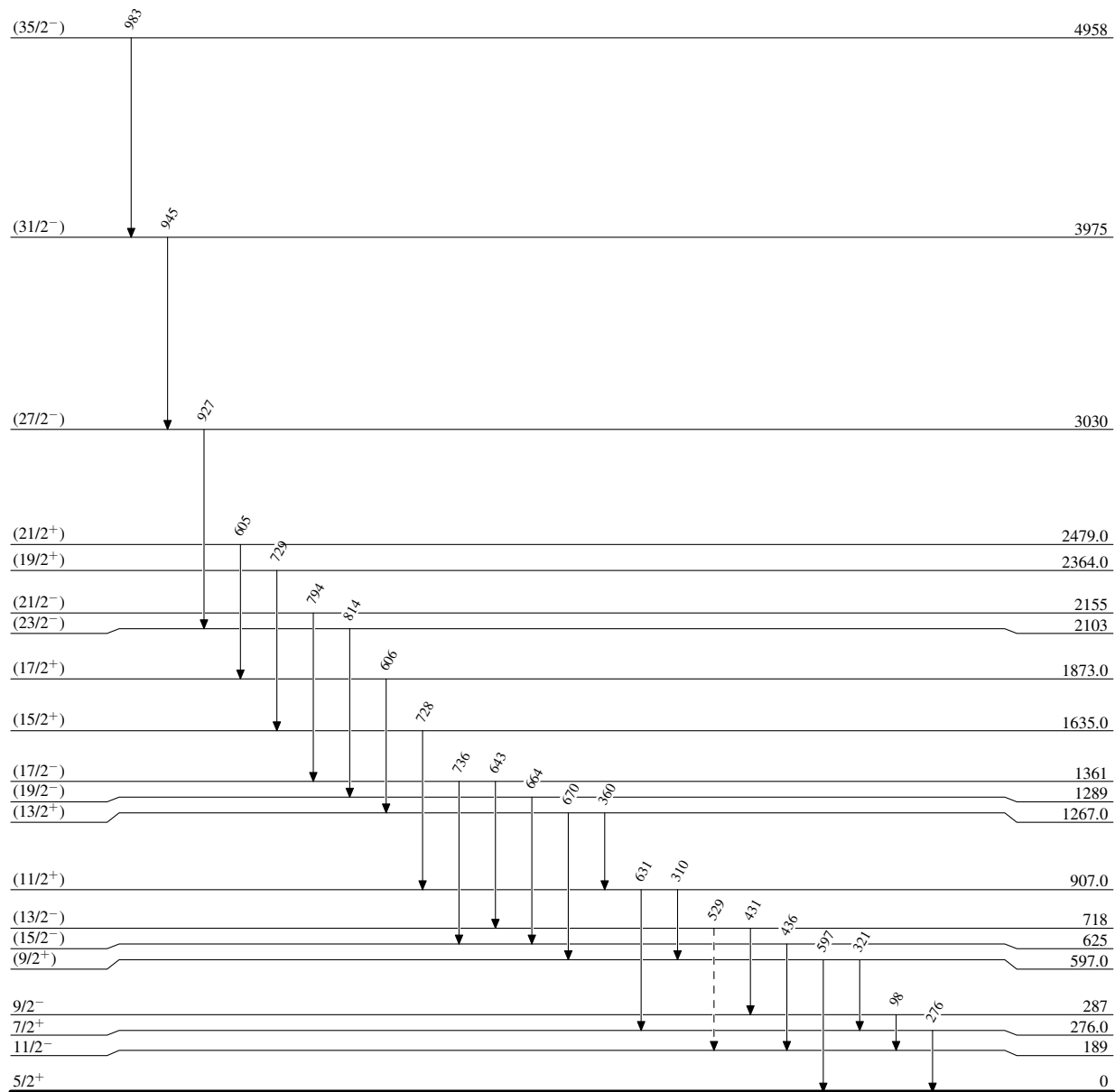
[†] Transitions from positive-parity states are observed only in 2012St13 with $\Delta E_\gamma=1$ keV. The others are observed in 1998Ku22 and 1999Ho25 but without uncertainties given. The evaluators assigned $\Delta E_\gamma=1$ keV for these γ -ray energies based on comparisons of the γ -ray spectra with that in 2012St13.

[‡] Placement of transition in the level scheme is uncertain.

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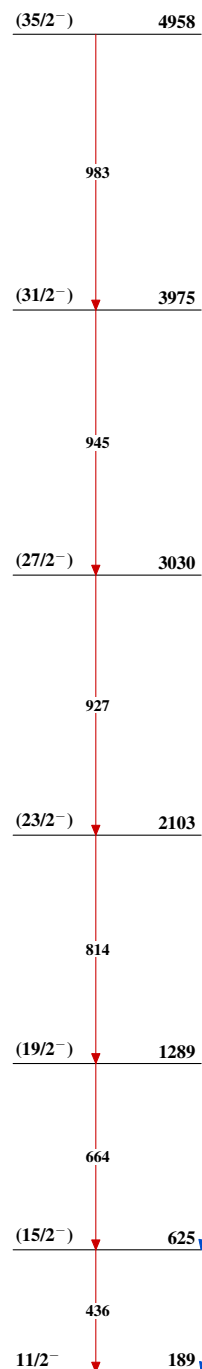
Legend

Level Scheme

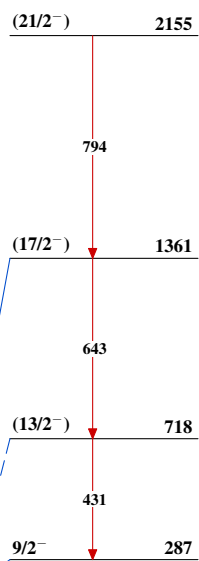
 - - - - - $\rightarrow$ γ Decay (Uncertain)

 $^{109}_{46}\text{Pd}_{63}$

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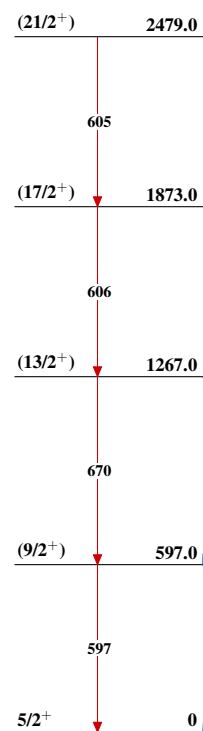
Band(A): Most likely the
 $\nu 3/2^- [541] (h_{11/2})$,
 $\alpha = -1/2$ band



Band(B): Most likely the
 $\nu 3/2^- [541] (h_{11/2})$,
 $\alpha = +1/2$ band



Band(C): $K^\pi = 5/2^+$ band,
 $\alpha = +1/2$



Band(D): $K^\pi = 5/2^+$ band,
 $\alpha = -1/2$

