

${}^{40}\text{Ca}({}^{40}\text{Ca,pn}\gamma)$ 2007Na13

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh		NDS 110, 1917 (2009)	30-Jun-2009

2007Na13 (also **2007Na37**): E=118 and 121 MeV beam produced at K130 cyclotron at University of Jyvaskyla. Measured E_γ , I_γ using JUROGAM array of 43 Compton-suppressed HPGe detectors. Used double-sided silicon strip detectors (DSSSD) and a planar Ge detector to detect positrons. The RITU gas-filled recoil separator used to separate ${}^{78}\text{Y}$ from the primary beam. The recoils were implanted in a double-sided silicon strip (DSSSD) in the GREAT focal plane spectrometer. See also R. Wadsworth et al., Acta Phys Pol B 40, 611 (2009).

Recoil- β decay tagging (RDT) method used to study excited states in ${}^{78}\text{Y}$.

 ${}^{78}\text{Y}$ Levels

E(level)	J^π [†]	$T_{1/2}$	Comments
0 [‡]	(0 ⁺)	47 ms 5	T=1
0+x	(5 ⁺)	5.8 s 6	$T_{1/2}$: measured by 2007Na13 from timing of 281 γ correlated with positrons from ${}^{78}\text{Y}$ decay. $J^\pi, T_{1/2}$: from 'Adopted Levels'. This isomer is populated strongly in the reaction used by 2007Na13 , implant-decay correlations for high-energy protons suggest that $\approx 90\%$ events feed this isomer. But the half-life is too long to correlate it with prompt γ rays feeding this isomer.
281 [‡]	(2 ⁺)		T=1
787 [‡]	(4 ⁺)		T=1

[†] From 'Adopted Levels'.

[‡] Band(A): Possible T=1 g.s. band.

 $\gamma({}^{78}\text{Y})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
281 ^{†‡}	281	(2 ⁺)	0	(0 ⁺)	E_γ : strongest γ ray correlated with positrons decaying with 47 ms half-life.
506 ^{†‡} ^x 615	787	(4 ⁺)	281	(2 ⁺)	E_γ : this γ ray may or may not originate from 6 ⁺ state of the g.s. band.

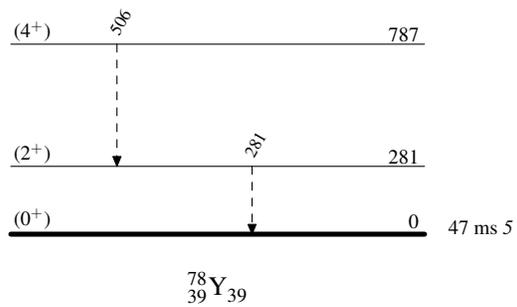
[†] Tentative assignment based on identification as analog of 504 and 278 γ rays in $4\pm > 2\pm > 0^+$ g.s. band in ${}^{78}\text{Sr}$.

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

^x γ ray not placed in level scheme.

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Legend

Level Scheme-----► γ Decay (Uncertain)

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g.s. band (4^+) 787

506

 (2^+) 281

281

 (0^+) 0 ${}^{78}_{39}\text{Y}_{39}$