

$^{76}\text{Co} \beta^-$ decay (16 ms) 2015So23

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan		NDS 194,3 (2024)	8-Jan-2024

Parent: ^{76}Co : $E=0$; $J^\pi=(1^-)$; $T_{1/2}=16$ ms 4; $Q(\beta^-)=16530$ syst; $\% \beta^-$ decay=100

^{76}Co -E, J^π , $T_{1/2}$: From ^{76}Co Adopted Levels.

^{76}Co - $Q(\beta^-)$: 16530 580 (syst,2021Wa16).

^{76}Co - $\% \beta^-$ decay: Assumed 100% β^- decay of the 16-ms isomer of ^{76}Co .

2015So23: ^{76}Co activity produced in $^9\text{Be}(^{238}\text{U},\text{F})$, $E=345$ MeV/nucleon reaction with the ^{238}U beam provided by the RIBF accelerator complex at RIKEN facility. Fission fragments were separated and analyzed by BigRIPS separator, transported to focal plane of ZeroDegree spectrometer. Particle identification was achieved by ΔE -tof- $B\rho$ method. Silicon detector stack WAS3ABi was used for ion implantation and β detection. Gamma rays were detected using EURICA array of 12 HPGe cluster detectors arranged in three rings at 51° , 90° and 120° with respect to the beam direction. About 1000 ^{76}Co ions were implanted in the WAS3ABi Si detector stack. Measured E_γ , I_γ , $\gamma\gamma$ -coin, $\beta\gamma(t)$, half-lives of isomers in ^{76}Co and ^{76}Ni . Deduced levels, J , π , configurations. Monte-Carlo shell-model (MCSM) calculation for level structure of ^{76}Ni , and shell-model calculation with LNPS interaction for structure of ^{76}Co .

 ^{76}Ni Levels

E(level) [†]	J^π [‡]
0.0	0^+
990.10 25	(2^+)
2994.6? 5	$(0^+, 2^+)$

[†] From E_γ values.

[‡] As given in Fig. 4 of 2015So23, based on Monte-Carlo shell-model calculations.

 $\gamma(^{76}\text{Ni})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
990.10 25	990.10	(2^+)	0.0	0^+	E_γ : from decay of (8^-) isomer (2015So23).
2004.5 [†] 4	2994.6?	$(0^+, 2^+)$	990.10	(2^+)	

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

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Decay Scheme

Legend

(1^-) 0 16 ms 4
 $Q_{\beta^-} = 16530$ syst
 $^{76}\text{Co}_{49}$ $\% \beta^- = 100$

----- \rightarrow γ Decay (Uncertain)

