

$^{73}\text{Co}$   $\beta^-$  decay (40.7 ms) 2012Ra10

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 158, 1 (2019)	16-May-2019

Parent:  $^{73}\text{Co}$ :  $E=0$ ;  $T_{1/2}=40.7$  ms  $I_3$ ;  $Q(\beta^-)=12690$  SY;  $\% \beta^-$  decay=100.0

$^{73}\text{Co}$ - $T_{1/2}$ : From  $^{73}\text{Co}$  Adopted Levels.

$^{73}\text{Co}$ - $Q(\beta^-)$ : 12690 400 (syst,2017Wa10).

$^{73}\text{Co}$ - $\% \beta^-$  decay:  $\% \beta^-$ -n<22 8 for the decay of  $^{73}\text{Co}$  (2012Ra10), estimated from  $I_\gamma(1095\text{-keV } \gamma \text{ ray})$ .

2012Ra10 (also 2005Ma95,2008RaZV,2010RaZY):  $^{73}\text{Co}$  produced in fragmentation of  $^{86}\text{Kr}$  beam at 140 MeV/nucleon with a  $^9\text{Be}$  target at NSCL facility followed by fragment separation using A1900 fragment separator. Particle identification by energy loss and time-of-flight techniques. The ions were implanted in double-sided silicon strip (DSSD) detectors for fragment  $\beta$  detection. SeGA gamma- detector array containing 16 HPGe detectors was used for  $E_\gamma$ ,  $I_\gamma$ ,  $\gamma\gamma$ ,  $\beta\gamma$  coin, ion- $\beta$  correlations and isotopic half-life measurements. Detailed shell-model calculations using NR78 residual interaction.

2004Sa59:  $^{73}\text{Co}$  produced in fragmentation of  $^{86}\text{Kr}$  beam in charge state  $36^+$ . The reaction products analyzed by LISE2000 spectrometer. Measured  $\beta$ ,  $\gamma$ ,  $\beta\gamma$  coin, isotopic half-life. Four unplaced  $\gamma$  rays reported. See also 2002MaZN thesis from the same laboratory.

Additional information 1.

 $^{73}\text{Ni}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$	Comments
0.0	(9/2 <sup>+</sup> )	0.84 s 3	$T_{1/2}$ : from Adopted Levels.
239.2 2	(7/2 <sup>+</sup> )		
524.3 4	(5/2 <sup>+</sup> )		
1299.0 6	(5/2 <sup>-</sup> )		

<sup>†</sup> From  $E_\gamma$  data.

<sup>‡</sup> From Adopted Levels, taken from 2012Ra10 based on systematics of level structures in  $^{69}\text{Ni}$  and  $^{71}\text{Ni}$ , and shell-model predictions.

 $\gamma(^{73}\text{Ni})$ 

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>†</sup>	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
<sup>x</sup> 158.0 4	10 4					
<sup>x</sup> 193.5 6	15 5					
239.2 2	100	239.2	(7/2 <sup>+</sup> )	0.0	(9/2 <sup>+</sup> )	$E_\gamma=238$ 2, $I_\gamma=35$ 40 (2004Sa59).
284.8 4	48 12	524.3	(5/2 <sup>+</sup> )	239.2	(7/2 <sup>+</sup> )	$E_\gamma=283$ 1, $I_\gamma=57$ 30 (2004Sa59).
524.6 5	25 9	524.3	(5/2 <sup>+</sup> )	0.0	(9/2 <sup>+</sup> )	$E_\gamma=524$ 1, $I_\gamma=100$ (2004Sa59).
774.7 4	76 20	1299.0	(5/2 <sup>-</sup> )	524.3	(5/2 <sup>+</sup> )	$E_\gamma=764$ 2, $I_\gamma=60$ 40 (2004Sa59).
<sup>x</sup> 1141.8 9	22 9					

<sup>†</sup> From 2012Ra10. Available values from 2004Sa59 are listed under comments. No decay scheme was proposed by 2004Sa59.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

$^{73}\text{Co}$   $\beta^-$  decay (40.7 ms) 2012Ra10

## Decay Scheme

Intensities: Relative  $I_\gamma$ 

## Legend

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

