

$^{238}\text{U}(^{64}\text{Ni},\text{X}\gamma)$ 2009Pa16,2013Mo36

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 202,59 (2025)	25-Feb-2025

Adapted from the XUNDL dataset for 2009Pa16, compiled by B. Karamy and B. Singh (McMaster) on May 12, 2009 including data received from D. Pauwels in an email reply to B. Singh on May 12, 2009.

2009Pa16: E=430 MeV ^{64}Ni beam was produced from the ATLAS accelerator at ANL. Target was 55 mg/cm² isotopically-enriched ^{238}U . γ rays were detected with the Gammasphere array consisting of 100 Compton-suppressed HPGe detectors. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ -coin, $\gamma\gamma\gamma$ -coin. Deduced levels, J, π .

2013Mo36: E=460 MeV ^{64}Ni beam was produced from the Laboratori Nazionali di Legnaro (LNL) Tandem-ALPI accelerator complex. Target was 1.35 mg/cm² ^{238}U on 1.2 mg/cm² thick Ta. Projectile-like products were identified with the magnetic spectrometer PRISMA. γ rays were detected by the AGATA demonstrator consisting of four triple clusters of Ge detectors. Measured $E\gamma$, $I\gamma$, particle- γ -coin, recoil-distance Doppler-shift intensity ratio with a plunger. Deduced levels, J, π , $T_{1/2}$, configurations. Comparison with large-scale shell-model calculations.

^{65}Co Levels

E(level) ^{†‡}	J π [#]	T _{1/2} [@]	Comments
0.0 ^{&}	(7/2 ⁻)		
883	(3/2 ⁻)		
1095	(1/2 ⁻)		
1223	(3/2 ⁻)		
1479.2 ^{& 2}	(9/2 ⁻)	0.9 ps 4	J π : (11/2) ⁻ in Adopted Levels.
1642.0 2	(11/2 ⁻)		
1959	(1/2 ⁻ ,3/2 ⁻)		J π : (3/2) ⁻ in Adopted Levels.
1997	(3/2 ⁻)		
2184	(1/2 ⁻ ,3/2 ⁻)		
2479.1 ^{& 2}	(11/2 ⁻)		
2669.2 ^{& 2}	(13/2 ⁻)	0.6 ps 4	
2892.0 6			
2926.2 3			
3028.4 ^{& 3}	(15/2 ⁻)		
3271.2 ^{& 4}	(15/2 ⁻ ,17/2 ⁺)		

[†] Additional information 1.

[‡] From a least-squares fit to γ -ray energies, assuming $\Delta E\gamma=1$ keV where not available.

[#] As proposed in 2009Pa16, based on their data of ^{65}Fe β^- decay and systematics of yrast and near-yrast levels in neighboring ^{61}Co and ^{63}Co .

[@] From Recoil-Distance Doppler-Shift (RDDS) method (2013Mo36).

[&] Seq.(A): Sequence based on g.s.

$\gamma(^{65}\text{Co})$

$E\gamma$ [†]	$I\gamma$	$E_i(\text{level})$	J π_i	E_f	J π_f
190.1 ^{‡ 2}	27 ^{‡ 5}	2669.2	(13/2 ⁻)	2479.1	(11/2 ⁻)
212		1095	(1/2 ⁻)	883	(3/2 ⁻)
242.8 ^{‡ 2}	20 ^{‡ 2}	3271.2	(15/2 ⁻ ,17/2 ⁺)	3028.4	(15/2 ⁻)
340		1223	(3/2 ⁻)	883	(3/2 ⁻)
359.2 ^{‡ 2}	26 ^{‡ 4}	3028.4	(15/2 ⁻)	2669.2	(13/2 ⁻)
412.9 ^{‡ 5}	2 ^{‡ 1}	2892.0		2479.1	(11/2 ⁻)
447.1 ^{‡ 2}	9 ^{‡ 2}	2926.2		2479.1	(11/2 ⁻)

Continued on next page (footnotes at end of table)

${}^{238}\text{U}({}^{64}\text{Ni},\text{X}\gamma)$ **2009Pa16,2013Mo36 (continued)** $\gamma({}^{65}\text{Co})$ (continued)

E_γ^\dagger	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
736		1959	(1/2 ⁻ ,3/2 ⁻)	1223	(3/2 ⁻)
774		1997	(3/2 ⁻)	1223	(3/2 ⁻)
837.1 \ddagger 2	13 \ddagger 3	2479.1	(11/2 ⁻)	1642.0	(11/2 ⁻)
864		1959	(1/2 ⁻ ,3/2 ⁻)	1095	(1/2 ⁻)
883		883	(3/2 ⁻)	0.0	(7/2 ⁻)
961		2184	(1/2 ⁻ ,3/2 ⁻)	1223	(3/2 ⁻)
999.9 \ddagger 2	27 \ddagger 2	2479.1	(11/2 ⁻)	1479.2	(9/2 ⁻)
1089		2184	(1/2 ⁻ ,3/2 ⁻)	1095	(1/2 ⁻)
1190.0 \ddagger 2	72 \ddagger 6	2669.2	(13/2 ⁻)	1479.2	(9/2 ⁻)
1479.2 \ddagger 2	100 \ddagger	1479.2	(9/2 ⁻)	0.0	(7/2 ⁻)
1642.0 \ddagger 2	11 \ddagger 2	1642.0	(11/2 ⁻)	0.0	(7/2 ⁻)

\dagger From the level scheme in FIG.7 of [2009Pa16](#), unless otherwise noted.

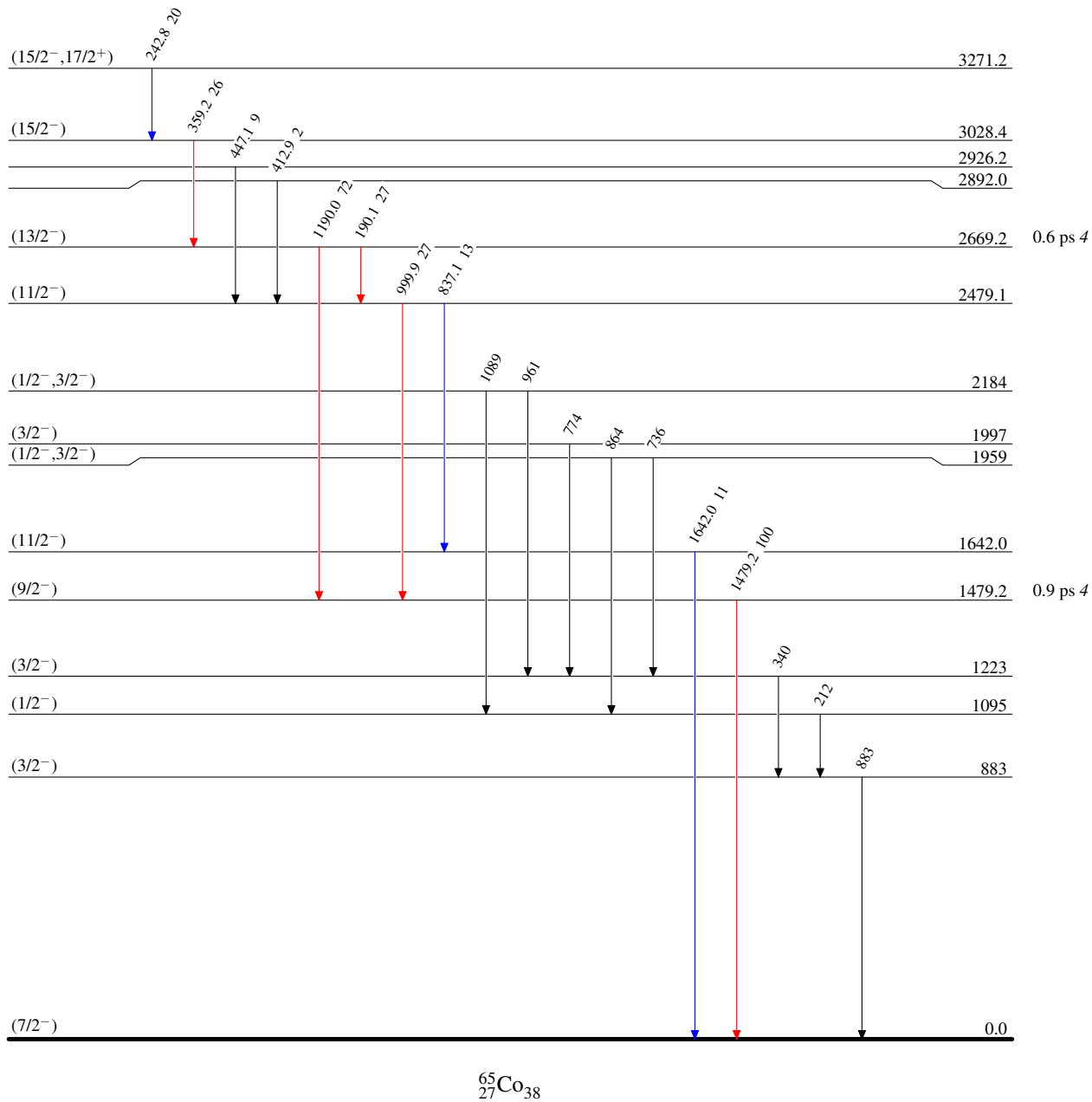
\ddagger From e-mail reply to B. Singh from D. Pauwels (first author of [2009Pa16](#)), on May 12, 2009. The data are from prompt $\gamma\gamma\gamma$ -coin matrix.

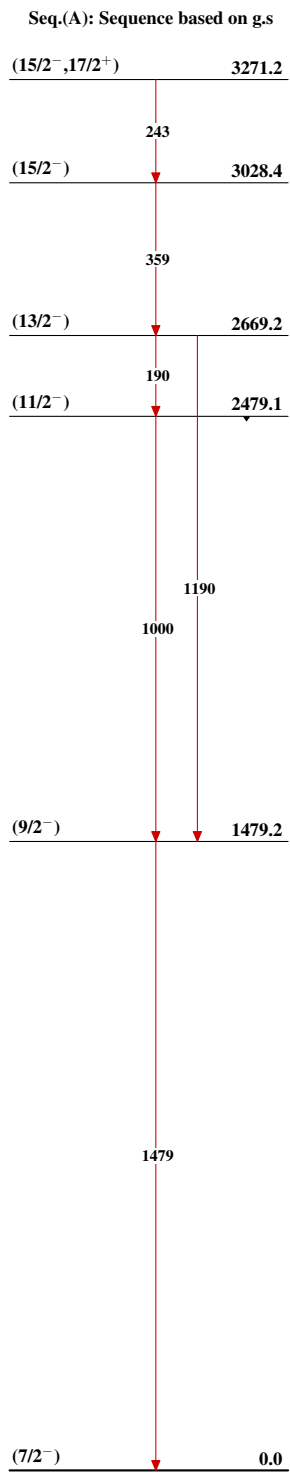
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Level Scheme
Intensities: Relative I_γ

Legend

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



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