

²³⁸U(⁴⁸Ca,Xγ) 2009Pa20

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

Includes ²³⁸U(⁶⁴Ni,Xγ) and ²⁰⁸Pb(⁴⁸Ca,Xγ) deep inelastic reactions.

2009Pa20: ²⁰⁸Pb(⁴⁸Ca,Xγ), E=305 MeV, ²³⁸U(⁴⁸Ca,Xγ), E=330 MeV and ²³⁸U(⁶⁴Ni,Xγ), E=430 MeV. All experiments used 50 mg/cm² targets and beams from the ATLAS accelerator at Argonne. Measured Eγ, Iγ, γγ coin, γγ(θ) with Gammasphere array (100 Compton-suppressed HPGe detectors).

Level scheme supported by coincidence data and systematics for odd-A Rb isotopes.

⁹¹Rb Levels

E(level) [†]	J ^π [‡]	T _{1/2}	Comments
0.0	3/2 ⁻		
108.9 10	5/2 ⁻		
721.9 13			
1134.2 @ 13	9/2 ⁺ #	16.6 ns 6	T _{1/2} : from Adopted Levels.
1840.9 @ 13	13/2 ⁺ #		
2979.3 @ 17	17/2 ⁺ #		
3574.6 17			
3878.7 17			
4098.2 @ 17	(21/2 ⁺)#		
4572.0 17			
5299.5 17			
6238.9 18			

[†] From least-squares fit to Eγ, assigning 1 keV uncertainty to data for which authors did not state an uncertainty.

[‡] Values suggested by 2009Pa20; supported by γ multipolarity for 3 transitions, deduced band structure and systematics of yrast levels in neighboring Rb isotopes.

Based on multiplicities deduced from measured γγ(θ).

@ Band(A): π g_{9/2}, α=+1/2 band.

γ(⁹¹Rb)

The assignment of γ rays to ⁹¹Rb is based on coincidence spectra obtained with double gates set on transitions below the 9/2⁺ isomer at 1134.3 keV and confirmed by examination of delayed coincidences across the isomer.

E _γ [†]	I _γ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. [‡]	Comments
108.9		108.9	5/2 ⁻	0.0	3/2 ⁻		
304.1 3	11.0 2	3878.7		3574.6			
412.4		1134.2	9/2 ⁺	721.9			
473.8 2	25.2 2	4572.0		4098.2	(21/2 ⁺)		
595.2 2	20.1 3	3574.6		2979.3	17/2 ⁺		
613.0		721.9		108.9	5/2 ⁻		
706.7 2	100 5	1840.9	13/2 ⁺	1134.2	9/2 ⁺	Q	Mult.: (707γ)(1138γ)(θ): A ₂ =+0.18 3, consistent with Q-Q cascade.
727.5 3	11.8 2	5299.5		4572.0			
939.4 3	11.6 2	6238.9		5299.5			
1025.3		1134.2	9/2 ⁺	108.9	5/2 ⁻		
1118.8 2	18.7 3	4098.2	(21/2 ⁺)	2979.3	17/2 ⁺	Q	Mult.: (1119γ)(1138γ)(θ): A ₂ =+0.09 6, consistent with Q(β ⁻)Q cascade.

Continued on next page (footnotes at end of table)

$^{238}\text{U}(^{48}\text{Ca},\text{X}\gamma)$ **2009Pa20** (continued) $\gamma(^{91}\text{Rb})$ (continued)

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
1138.4	38.8 3	2979.3	17/2 ⁺	1840.9	13/2 ⁺	Q	Mult.: (1138 γ)(707 γ)(θ): $A_2=+0.18$ 3, consistent with Q-Q cascade.

[†] Energy uncertainty and I_γ from e-mail reply to B. Singh from T. Pawlat (first author of [2009Pa20](#)). Intensity above the isomer is normalized so $I_\gamma(706.7\gamma)=100$.




[‡] From measured $\gamma\gamma(\theta)$.

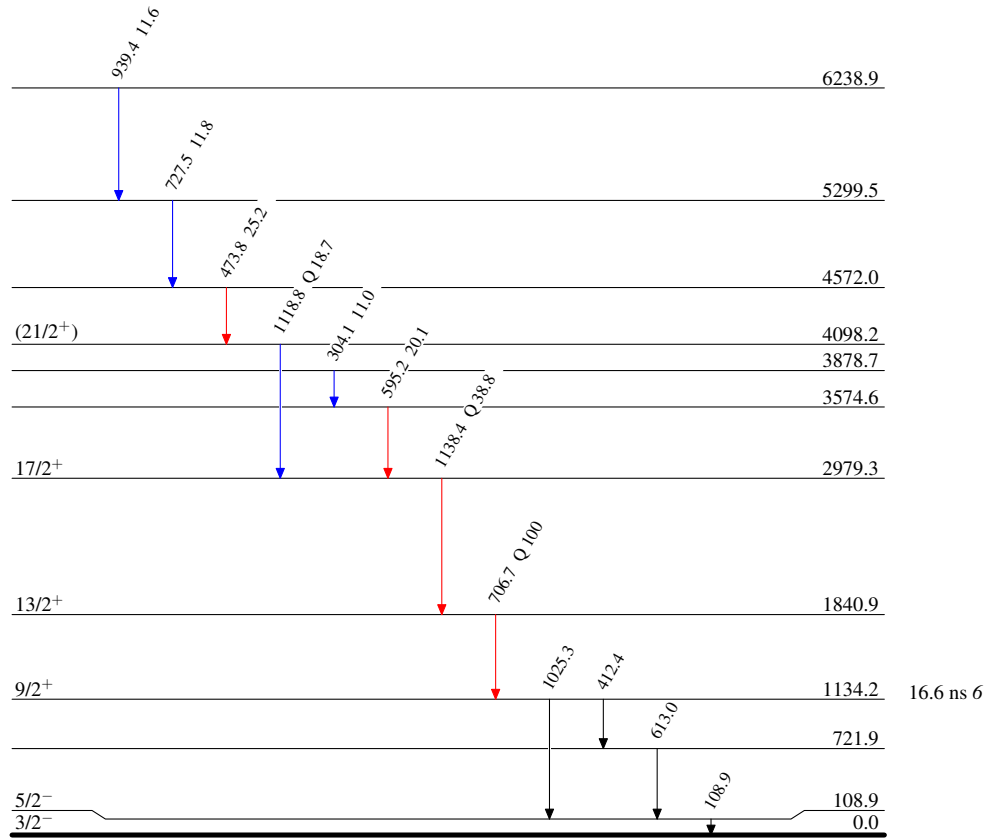
$^{238}\text{U}(^{48}\text{Ca},\text{X}\gamma)$ 2009Pa20

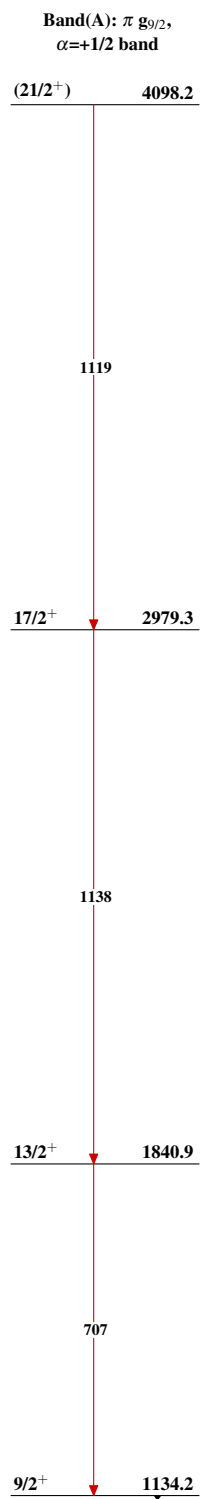
Level Scheme

Intensities: Relative I_γ

Legend

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

 $^{91}_{37}\text{Rb}_{54}$

${}^{238}\text{U}({}^{48}\text{Ca},\text{X}\gamma)$ 2009Pa20 ${}^{91}_{37}\text{Rb}_{54}$