

${}^{238}\text{U}({}^{48}\text{Ca},\text{X}\gamma)$  2011Kr12

Type	Author	History Citation	Literature Cutoff Date
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Includes  ${}^{208}\text{Pb}({}^{48}\text{Ca},\text{X}\gamma)$ .

**2011Kr12**: three measurements: one was performed with 330 MeV  ${}^{48}\text{Ca}$  beam produced at the ANL ATLAS accelerator. Target of a 50 mg/cm<sup>2</sup> metallic  ${}^{238}\text{U}$ .  $\gamma$ -rays detected by the Gammasphere array. The other two were carried out at the INFN LNL Legnaro Tandem-ALPI accelerators with 330 MeV  ${}^{48}\text{Ca}$  beam on a 0.6 mg/cm<sup>2</sup>  ${}^{238}\text{U}$  target and 310 MeV  ${}^{48}\text{Ca}$  beam on a 1.0 mg/cm<sup>2</sup> enriched  ${}^{208}\text{Pb}$  target. Fragments were identified by the PRISMA spectrometer and  $\gamma$ -rays were detected by the CLARA germanium detector array. Measured  $E_\gamma$ ,  $I_\gamma$ , particle- $\gamma$  coin. Deduced levels,  $J^\pi$ ,  $\gamma$ -branchings, transition probabilities.

 ${}^{48}\text{K}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$ <sup>#</sup>	Comments
0	(1 <sup>-</sup> )		E(level), $J^\pi$ : the (1 <sup>-</sup> ) state at E=x proposed in 2004IsZX is resolved by 2001KR12 to be the ground state based on observed $\gamma$ -decay pattern of the (5 <sup>+</sup> ) isomer and information from ${}^{48}\text{K}$ $\beta^-$ decay.
142.70 24	(2 <sup>-</sup> )	21 ps 6	
279.00 10	(2 <sup>-</sup> )	5.3 ps 10	
728.01 14	(3 <sup>-</sup> )	3.6 ps 7	
2177.14 17	(5 <sup>+</sup> )	7.1 ns 5	$T_{1/2}$ : from $\gamma\gamma(t)$ in the Gammasphere measurement (2011Kr12).
3403.5 5	(5 <sup>-</sup> )		
3586.2 6	(7 <sup>+</sup> )		

<sup>†</sup> From a least-squares fit to  $\gamma$ -ray energies.

<sup>‡</sup> From 2011Kr12 based on comparisons of  $\gamma$ -decays with shell-model expectations.

<sup>#</sup> From recoil-distance Doppler shift using plunger at PRISMA-CLARA facility (2011Kr12), unless otherwise noted.

 $\gamma({}^{48}\text{K})$ 

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>‡</sup>	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
136.0	<1.0	279.00	(2 <sup>-</sup> )	142.70	(2 <sup>-</sup> )	
142.7 3	4.3 9	142.70	(2 <sup>-</sup> )	0	(1 <sup>-</sup> )	$I_\gamma$ : 44 2 from PRISMA-CLARA measurement.
279.0 1	100	279.00	(2 <sup>-</sup> )	0	(1 <sup>-</sup> )	
449.0 1	100	728.01	(3 <sup>-</sup> )	279.00	(2 <sup>-</sup> )	$I_\gamma$ : 65 2 from PRISMA-CLARA measurement.
585.0 10	2.5 8	728.01	(3 <sup>-</sup> )	142.70	(2 <sup>-</sup> )	
728.0	<0.8	728.01	(3 <sup>-</sup> )	0	(1 <sup>-</sup> )	
1409.0 5	5.4 8	3586.2	(7 <sup>+</sup> )	2177.14	(5 <sup>+</sup> )	$I_\gamma$ : 5 3 from PRISMA-CLARA measurement.
1449.1 1	41.5 15	2177.14	(5 <sup>+</sup> )	728.01	(3 <sup>-</sup> )	$I_\gamma$ : 3 2 from PRISMA-CLARA measurement.
1898.0	<0.2	2177.14	(5 <sup>+</sup> )	279.00	(2 <sup>-</sup> )	
2034.5 4	1.2 3	2177.14	(5 <sup>+</sup> )	142.70	(2 <sup>-</sup> )	
2675.4 4	3.1 10	3403.5	(5 <sup>-</sup> )	728.01	(3 <sup>-</sup> )	

<sup>†</sup> From the PRISMA-CLARA measurement in 2011Kr12.

<sup>‡</sup> From the Gammasphere measurement in 2011Kr12.

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Legend

## Level Scheme

Intensities: Relative  $I_\gamma$ 

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

