

$^{208}\text{Pb}(^{48}\text{Ca}, ^{47}\text{Ca})$ 2012Mo11

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Ota and E. A. Mccutchan		NDS 203,1 (2025)	1-Apr-2025

Includes $^{64}\text{Ni}(^{48}\text{Ca}, ^{47}\text{Ca})$ E=282 MeV.

Two experiments performed at LNL of INFN using PRISMA-CLARA system.

Reactions used: 1. $^{64}\text{Ni}(^{48}\text{Ca}, ^{47}\text{Ca})$ E=282 MeV, target=0.98 mg/cm². Projectile-like products selected using PRISMA magnetic spectrometer. Measured $\gamma(\theta)$ and $\gamma(\text{lin pol})$ using CLARA array of 23 Compton-suppressed HPGe clover detectors. 2. $^{208}\text{Pb}(^{48}\text{Ca}, ^{47}\text{Ca})$ E=310 MeV, target=1.0 mg/cm² evaporated on a 1.0 mg/cm² Ta layer. A 4 mg/cm² Mg foil was used after the target as an energy degrader. Projectile-like products selected using PRISMA magnetic spectrometer. Half-lives of excited states were measured using differential Recoil Distance Doppler Shift method by varying the target-to-degrader distance. Comparisons with full fp shell-model calculations.

Others: see 2012LeZS, 2012Le19, and 2012Le23 which are summary conference proceedings by the same group.

 ^{47}Ca Levels

E(level) [†]	J ^π	T _{1/2} [‡]	Comments
0.0	7/2 ⁻		
2013.7	3/2 ⁻	4.23 ps 21	
2578.5	3/2 ⁺	6.65 ps 97	
2599.7	1/2 ⁺	4.71 ps 42	
3562	(9/2 ⁻ , 11/2 ⁻) [#]		
3934.1	(11/2 ⁺)		E(level): from the Adopted Levels.
3999.4	(11/2 ⁺ , 13/2 ⁺) [#]	44 ps 11	T _{1/2} : from recoil-distance Doppler-shift method (2012Mo11) in $^{64}\text{Ni}(^{48}\text{Ca}, ^{47}\text{Ca})$ experiment.
4403	(13/2 ⁺ , 15/2 ⁺) [#]		
4811	(15/2 ⁺ , 17/2 ⁺) [#]		

[†] From least square fit to E_γ by evaluators, except where noted.

[‡] From recoil-distance Doppler-shift method (2012Mo11) in $^{208}\text{Pb}(^{48}\text{Ca}, ^{47}\text{Ca})$ experiment, unless otherwise stated.

[#] 2012Mo11 assumed from 2006Br09 and ENSDF database. First assignment is strongly preferred by 2012Mo11 based on energy sequence of observed states (as in review paper by 2006Br09) and other considerations such as comparison with shell-model calculations.

 $\gamma(^{47}\text{Ca})$

E _i (level)	J _i ^π	E _γ	I _γ	E _f	J _f ^π	Mult.	Comments
2013.7	3/2 ⁻	2013.7		0.0	7/2 ⁻	E2	A ₂ =+0.20 4 POL=+0.05 5.
2578.5	3/2 ⁺	564.8		2013.7	3/2 ⁻	E1	A ₂ =+0.37 5
		2578.5		0.0	7/2 ⁻	M2	
2599.7	1/2 ⁺	586.0		2013.7	3/2 ⁻	E1	$\gamma(\theta)$ is isotropic consistent with 1/2 ⁺ assignment for 2599.7 level.
		2599.7		0.0	7/2 ⁻	E3	E _γ : doublet-peak structure in γ spectrum (with 2578.5 γ).
3562	(9/2 ⁻ , 11/2 ⁻)	3562		0.0	7/2 ⁻		E _γ : from the Adopted Gammas.
3934.1	(11/2 ⁺)	3933.8		0.0	7/2 ⁻		E _γ : from the Adopted Gammas.
3999.4	(11/2 ⁺ , 13/2 ⁺)	(65.3)	18.6 [†] 18	3934.1	(11/2 ⁺)	(M1)	
		437.0	23.2 [†] 24	3562	(9/2 ⁻ , 11/2 ⁻)	(E1)	
		3999.4	58.2 [†] 17	0.0	7/2 ⁻		
4403	(13/2 ⁺ , 15/2 ⁺)	404		3999.4	(11/2 ⁺ , 13/2 ⁺)		E _γ : doublet-peak structure in γ spectrum (with 408 γ).
4811	(15/2 ⁺ , 17/2 ⁺)	408		4403	(13/2 ⁺ , 15/2 ⁺)		

Continued on next page (footnotes at end of table)

²⁰⁸Pb(⁴⁸Ca, ⁴⁷Caγ) **2012Mo11** (continued)

γ(⁴⁷Ca) (continued)

† **2012Mo11** cite reference 15 (**2006Br09**) for the branching ratio but neither **2006Br09** nor related **2001Br35** (or **2001BrZZ**) contain the intensity data. According to an e-mail reply of April 14, 2012 from S. Leoni (corresponding author of **2012Mo11**) intensities were obtained as priv. comm. from R. Broda (author of **2006Br09**). A copy of this communication was not available to the evaluators.

²⁰⁸Pb(⁴⁸Ca, ⁴⁷Caγ) **2012Mo11**

Legend

Level Scheme

Intensities: % photon branching from each level

----- ► γ Decay (Uncertain)

