

²⁴⁸Cm, ²⁵²Cf SF decay 2010Rz02

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 185, 2 (2022)	23-Aug-2022

Parent: ²⁴⁸Cm: E=0.0; J^π=0⁺; T_{1/2}=3.48×10⁵ y 6; %SF decay=8.39 16

Parent: ²⁵²Cf: E=0.0; J^π=0⁺; T_{1/2}=2.647 y 3; %SF decay=3.102 3

²⁴⁸Cm(0.0)-T_{1/2}: From ²⁴⁸Cm Adopted Levels in the ENSDF database (Sept 2014 update).

²⁴⁸Cm(0.0)-%SF decay: %SF=8.39 16 for ²⁴⁸Cm SF decay.

²⁵²Cf(0.0)-T_{1/2}: From ²⁵²Cf Adopted Levels in the ENSDF database (Jan 2021 update).

²⁵²Cf(0.0)-%SF decay: %SF=3.102 3 for ²⁵²Cf SF decay.

2010Rz02: measured E_γ, I_γ and γγ using EUROGAM2 array and four LEPS detectors for ²⁴⁸Cm SF decay in Strasbourg, and GAMMASPHERE array for ²⁵²Cf SF decay at ANL. Also coincidences with γ rays from complementary fission fragments of Rb isotopes for ²⁴⁸Cm experiment and with γ rays from Y isotopes for ²⁵²Cf SF decay. Comparison with quasiparticle-rotor model calculations.

¹⁴⁹Pr Levels

E(level) [†]	J ^π	T _{1/2}	Comments
0.0	(5/2 ⁺)		Dominant configuration=π5/2[413] from QRPM calculations (2010Rz02).
58.1 [‡] 3	(7/2 ⁻)	26 ns 4	T _{1/2} : from γγ(t) (2010Rz02) in ²⁵² Cf SF decay. Other: 22.9 ns 18 from 1974CIZX using (fragment)(fragment)(x-ray)γ(t) in ²⁴⁸ Cm, SF decay. See also the Adopted Levels, where the T _{1/2} values from ¹⁴⁹ Ce β ⁻ decay, shorter by a factor of ≈3 from those in SF decays are discussed. Dominant configuration=π1/2[550] from QRPM calculations (2010Rz02); the levels of this band mix with π3/2[541] orbital.
160.7 [‡] 4	(11/2 ⁻)		
380.4 [‡] 5	(15/2 ⁻)		
710.7 [‡] 6	(19/2 ⁻)		
1126.7 [‡] 7	(23/2 ⁻)		
1606.3 [‡] 7	(27/2 ⁻)		
2128.6 [‡] 8	(31/2 ⁻)		
2663.4 [‡] 8	(35/2 ⁻)		
3183.7 [‡] 9	(39/2 ⁻)		

[†] From E_γ in 2010Rz02, assuming Δ(E_γ)=0.3 keV for each γ ray.

[‡] Band(A): Band based on π1/2[550], α=-1/2.

γ(¹⁴⁹Pr)

E _γ	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. [†]	α [‡]	Comments
58.1	58.1	(7/2 ⁻)	0.0	(5/2 ⁺)	E1	1.094 15	α(K)exp=0.9 4 (2010Rz02); α(exp)=1.7 6 (2010Rz02) α(K)=0.916 13; α(L)=0.1408 20; α(M)=0.0296 4 α(K)exp: from intensities of 58γ, 35.9 and 40.7 keV K-x rays of Pr. B(E1)(W.u.)=2.6×10 ⁻⁵ 2 deduced by 2010Rz02 using a T _{1/2} =22.9 ns 18. B(E1) rates and deduced electric dipole moments in neighboring nuclides and from predictions of QRPM calculations are discussed in 2010Rz02. T _{1/2} in the Adopted Levels is 23.4 ns 18.
102.6	160.7	(11/2 ⁻)	58.1	(7/2 ⁻)	(E2)	1.933 27	α(exp)=2.2 6 (2010Rz02) Mult.: M1,E2 from total conversion coefficient (2010Rz02), but (E2) from assigned J ^π values.

Continued on next page (footnotes at end of table)

$^{248}\text{Cm}, ^{252}\text{Cf}$ SF decay **2010Rz02** (continued)

$\gamma(^{149}\text{Pr})$ (continued)

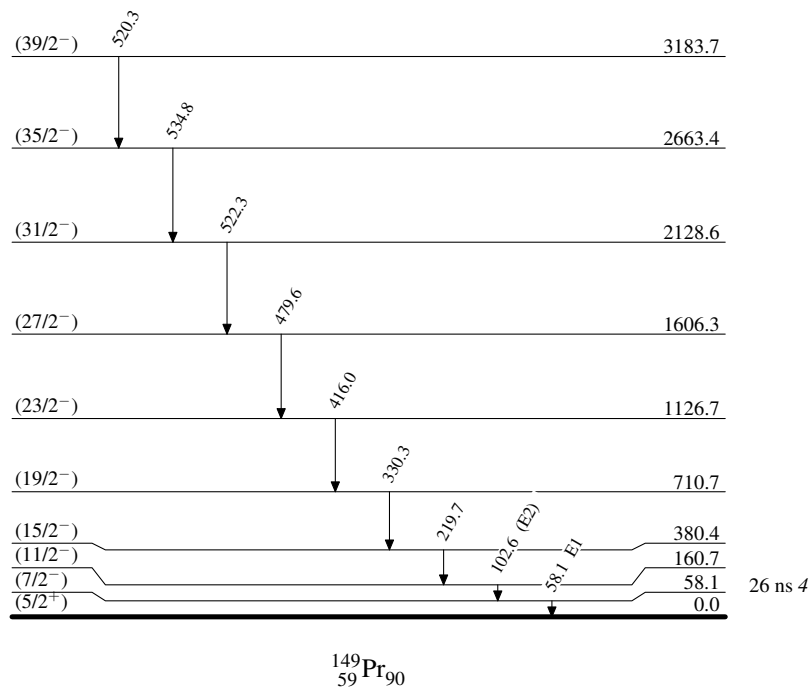
E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
219.7	380.4	(15/2 ⁻)	160.7	(11/2 ⁻)
330.3	710.7	(19/2 ⁻)	380.4	(15/2 ⁻)
416.0	1126.7	(23/2 ⁻)	710.7	(19/2 ⁻)
479.6	1606.3	(27/2 ⁻)	1126.7	(23/2 ⁻)
520.3	3183.7	(39/2 ⁻)	2663.4	(35/2 ⁻)
522.3	2128.6	(31/2 ⁻)	1606.3	(27/2 ⁻)
534.8	2663.4	(35/2 ⁻)	2128.6	(31/2 ⁻)

† From $\alpha(\text{K})_{\text{exp}}$ and/or $\alpha(\text{exp})$ obtained in **2010Rz02**.

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (**2008Ki07**) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

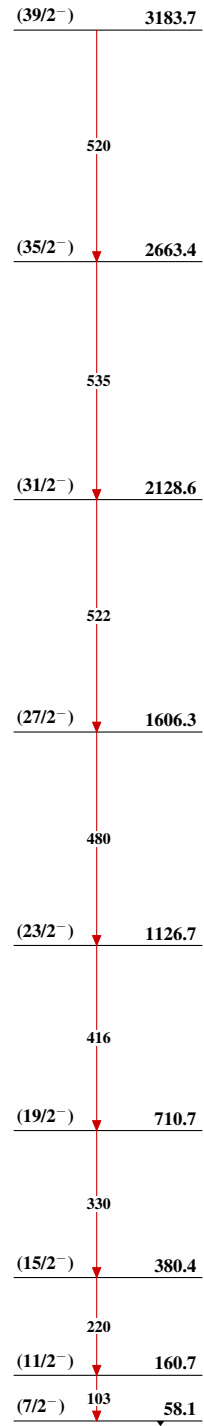
$^{248}\text{Cm}, ^{252}\text{Cf}$ SF decay **2010Rz02**

Level Scheme



$^{248}\text{Cm}, ^{252}\text{Cf}$ SF decay 2010Rz02

Band(A): Band based on
 $\pi 1/2[550], \alpha = -1/2$

 $^{149}_{59}\text{Pr}_{90}$