⁹Be(²³⁸U,Fγ) 2014Ta29

History										
Туре	Author	Citation	Literature Cutoff Date							
Full Evaluation	Balraj Singh	ENSDF	31-Jul-2015							

2014Ta29: $E(^{238}U)=345$ MeV/nucleon beam from RIBF-RIKEN facility. Target=3 mm thick ⁹Be. Ions were separated, in flight, using BigRIPS separator with particle identification by atomic number and A/q ratio using ΔE -tof-B ρ technique. The ¹²⁹Cd ions were finally transported through the ZeroDegree spectrometer and implanted into the WAS3ABi for β and ion detection. Gamma rays were detected using an array of 12 Ge cluster detectors. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$, prompt γ (particle)- coin during the first 10 ms of implantation. Particle energy of 295-430 keV corresponded to conversion electrons, and <250 keV to Compton electrons. Spectra were also measured 30-40 ms after implantation, which were then subtracted from the ones obtained during the first 10 ms. Deduced a new ms isomer and its half-life, excited states and γ rays, configurations. Monte Carlo simulations were performed to test the proposed level scheme. Comparison with shell-model calculations.

¹²⁹Cd Levels

E(level)	$J^{\pi \dagger}$	T _{1/2}	Comments
0	$11/2^{-}$		
1181	(13/2 ⁻)		Ordering of the 406-1181 γ cascade is not established experimentally, but the level ordering in energies and spins is predicted by shell-model calculations.
1587	$(15/2^{-})$		Configuration= $vh_{11/2}^{-1} \otimes \pi g_{0/2}^{-2}$.
1940	$(21/2^+)$	3.6 ms 2	%IT=100
			T _{1/2} : from summed time difference distribution of the 406- and 1181-keV γ rays (2014Ta29). Configuration= $\nu h_{11/2}^{-1} \otimes \pi (g_{9/2}^{-1} p_{1/2}^{-1})$ mixed with $\nu h_{11/2}^{-1} \otimes \pi (g_{9/2}^{-1} p_{3/2}^{-1})$ and $\nu h_{11/2}^{-1} \otimes \pi (g_{9/2}^{-1} f_{5/2}^{-1})$.

[†] From shell-model predictions.

 $\gamma(^{129}\text{Cd})$

E _i (level)	\mathbf{J}_i^{π}	Eγ	Iγ	\mathbf{E}_{f}	J_f^π	Mult. [‡]	α #	Comments
1181	$(13/2^{-})$	1181 [†]	100	0	11/2-			
1587	$(15/2^{-})$	406†	100	1181	(13/2 ⁻)	(M1)	0.0111	
		1587	≈33	0	$11/2^{-}$			
1940	$(21/2^+)$	353	100	1587	$(15/2^{-})$	(E3)	0.0665	B(E3)(W.u.)=0.50 3 (2014Ta29)

[†] Ordering of the 406-1181 γ cascade is not established experimentally, but the level ordering in energies and spins is predicted by shell-model calculations.

[‡] From measured yields of γ rays and conversion electrons for the 353 and 406 transitions.

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

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Level Scheme



