Be(^{86}Kr,Xγ) 2013Pe03,2010Da06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 114, 841 (2013)	30-Jun-2013

2013Pe03: ^{75}Cu produced by the fragmentation of ^{86}Kr on a Be target at 60.4 MeV/nucleon at GANIL. The fragments were separated using the LISE2000 spectrometer. The Bρ-ΔE-tof technique used to identify the fragments.

2010Da06: ^{75}Cu was produced following the fragmentation of ^{86}Kr (60.5 MeV/nucleon) beam on natural Ni (thickness 100 μm) at GANIL, using LISE spectrometer. Also 1999DaZQ thesis related to the same study. The Bρ-ΔE-tof technique used to identify the fragments.

Level scheme is based on observation of the two gamma rays, 61.7(4) and 66.2(4) keV, observed in both experiments with similar decay times. Although 2010Da06 claims that 66.5-61.8 $\gamma\gamma$ represents a cascade, the later experiment of the same group (2013Pe03) shows that they are not coincident. From Shell Model arguments, it is considered that the two levels at 61.7 keV and 66.2 keV are $1/2^-$ and $3/2^-$ spins but the authors of 2013Pe03 cannot decide on the correspondence energy-spin. The $1/2^-$ –> $5/2^-$ transition is E2, the $3/2^-$ –> $1/2^-$ (or $1/2^-$ –> $3/2^-$) unobserved transition between the two excited levels is M1 and the $3/2^-$ –> $5/2^-$ transition is M1+E2.

^{75}Cu Levels

E(level)	J$^\pi$	T$_{1/2}$[†]	Comments
0.0	$5/2^{(-)}$		J$^\pi$: from Adopted Levels.
61.7 *4*	$(1/2^-,3/2^-)$[‡]	310 ns *8*	T$_{1/2}$: from 2013Pe03. 2010Da06 gives T$_{1/2}$=370 ns *40*.
66.2 *4*	$(1/2^-,3/2^-)$[‡]	149 ns *6*	T$_{1/2}$: from 2013Pe03. 2010Da06 gives T$_{1/2}$=170 ns *15*.

[†] From time difference between the implantation of the heavy ions in Si detectors and the delayed γ rays detected with four HPGe detectors.

[‡] From comparison with Shell Model calculations. No preference between the two possibilities, one excited level being $1/2^-$ and the other $3/2^-$.

γ(^{75}Cu)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[†]	Comments
(4.5 *6*)		66.2	$(1/2^-,3/2^-)$	61.7	$(1/2^-,3/2^-)$	[M1]	54 *20*	E$_\gamma$: γ not observed directly. Its existence is assumed based on the decay and population time pattern of the two observed gammas, 61.7 and 66.2 (Figure 2 from 2013Pe03): the 61.7 γ seems to appear later, showing that the 61.7 level is populated through the decay of the 66.2 level.
61.7 *4*	100	61.7	$(1/2^-,3/2^-)$	0.0	$5/2^{(-)}$	[M1,E2]	2.0 *18*	E$_\gamma$: 61.8 5 (2010Da06).
66.2 *4*		66.2	$(1/2^-,3/2^-)$	0.0	$5/2^{(-)}$	[M1,E2]	1.5 *13*	E$_\gamma$: 66.5 5 (2010Da06).

[†] Additional information 1.

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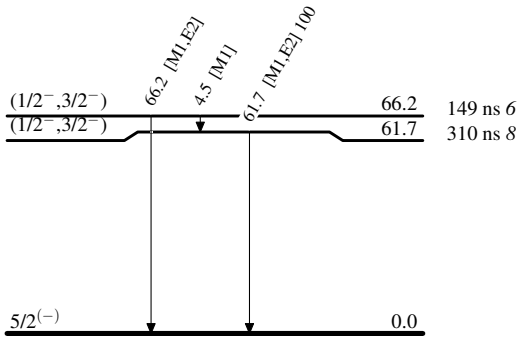
Legend

Level Scheme

Intensities: Relative I_γ

γ Decay (Uncertain)



$^{75}_{29}Cu_{46}$