^{9}Be(^{48}K,^{48}Arγ) 2009Ga09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

2009Ga09: Two-step reaction: ^{9}Be(^{48}Ca,^{48}K) followed by ^{9}Be(^{48}K,^{48}Arγ). E=85.7 MeV/nucleon (at midtarget) ^{48}K beam was produced via 140 MeV/nucleon ^{48}Ca primary beam from the coupled-cyclotron facility at NSCL bombarding a 705 mg/cm^2 ^{9}Be production target. Fragments were separated by the A1900 fragment separator. Reaction target was 376 mg/cm^2 ^{9}Be. γ rays were detected with the SeGA array of 32-fold segmented Ge detectors and charged particles were analyzed event-by-event with the focal-plane detection system of the S800 spectrograph, with the energy loss and time-of-flight information used to identify the reaction residues from the reaction target. Measured γ-ray and ^{48}Ar spectra, (particle)γ coin. Deduced excited states in ^{48}Ar. Comparisons with shell-model calculations.

Inclusive measured cross section=0.13 mb *1*.

2009Ga09 give measured population of 39% *8* for the 2^+ state and 34% *5* for the 4^+ state, the remaining is attributed to populate the ground state.

^{48}Ar Levels

E(level)†	J$^\pi$‡	Comments
0	0^+	
1037 *6*	(2^+)	Population=39% *8* from efficiency-corrected peak areas.
2743 *12*	(4^+)	Population=34% *5* from efficiency-corrected peak areas.

† From Eγ data.

‡ Assignments for excited states are proposed by 2009Ga09 from comparisons with shell-model calculations.

γ(^{48}Ar)

E$_\gamma$†	I$_\gamma$‡	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
1037 *6*	100	1037	(2^+)	0	0^+
1706 *10*	47 *8*	2743	(4^+)	1037	(2^+)

† From 2009Ga09.

‡ Deduced from feedings to the 2^+ and 4^+ levels in 2009Ga09. The areas of the peaks of 1706γ and 1037γ in Fig.4 of 2009Ga09 are: 69 *10* for 1706 and 206 *17* for 1037 peak, as communicated to the Dr. B. Singh by A. Gade in an email reply of May 7, 2009. When corrected for efficiency factors, the area of the 1037 peak is about double that of 1706 peak.

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Level Scheme

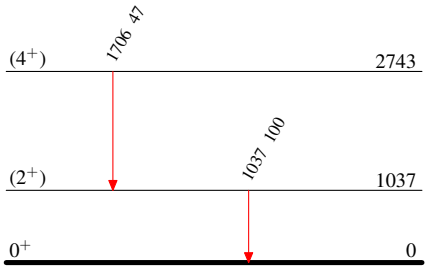
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{48}_{18}Ar_{30}$