

$^2\text{H}(^{24}\text{O},^{25}\text{O})$  [2017Jo12](#)

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty	NDS 205,1 (2025)	31-May-2025

Adopted/Edited the XUNDL dataset compiled by Jun Chen (NSCL/MSU), December 1, 2017.

[2017Jo12](#): E=83.4 MeV/nucleon  $^{24}\text{O}$  beam was produced by fragmentation of  $^{48}\text{Ca}$  beam on a  $^9\text{Be}$  target at NSCL facility.

Fragments were separated using A1900 fragment separator. The secondary target was the Ursinus College Liquid Hydrogen Target filled with liquid deuterium. Reacted  $^{24}\text{O}$  was detected by a position and energy sensitive charged particle detector and separated and identified based on energy loss and time-of-flight. Emitted neutrons from  $^{25}\text{O}$  decay were detected by the MoNA-LISA neutron detector array. Measured decay energy spectrum. Deduced neutron-unbound levels, width, limit of relative cross section of a possible  $1/2^+$  excited state with respect to ground state. Comparisons with theoretical calculations.

 $^{25}\text{O}$  Levels

E(level)	$J^\pi$	$\Gamma$	L	Comments
0	$3/2^+$		2	E(level),L: neutron-unbound state with neutron-decay resonant energy=830 keV <i>170</i> from a best-fit to the measured decay-energy spectrum ( <a href="#">2017Jo12</a> ). $J^\pi$ : From L(n)=2 and theoretical predictions.
$\approx 2500?$	$(1/2^+)$	1 keV		E(level): from resonance energy of this state at 3.3 MeV ( <a href="#">2017Jo12</a> ) and g.s. resonance at 754 keV. $J^\pi, \Gamma$ : measured data of resonance energy=3.3 MeV, width=1 keV, and a relative cross section of $\sigma(1/2^+)/\sigma(\text{g.s.})=0.25 +100-0.25$ are consistent with the inclusion of a $1/2^+$ state predicted by theoretical calculations, but are insufficient to confirm the observation of this state and proposed tentative $1/2^+$ ( <a href="#">2017Jo12</a> - ( $^{24}\text{O},^{25}\text{O}$ )). Relative cross section: $\sigma_{1/2^+}/\sigma_{\text{g.s.}}=0.25 +100-25$ ( <a href="#">2017Jo12</a> ).