

$^2\text{H}(^{24}\text{O},2\text{n}^{22}\text{O})$ [2015Jo14](#)

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty		NDS 186, 2 (2022)	31-Mar-2022

Adapted from XUNDL dataset compiled by J. Chen (NSCL, MSU), December 3, 2015.

^{24}O secondary beam, $E=83.4$ MeV/nucleon, of 30% purity, produced by fragmentation of ^{48}Ca primary beam, $E=140$ MeV/nucleon, bombarding a ^9Be target (thickness 1363 mg/cm²) at NSCL. The ^{24}O ions were separated by the A1900 fragment separator and impinged upon the Ursinus College Liquid Hydrogen Target filled with liquid deuterium (LD_2). Resulting charged particles were detected with a series of position-sensitive and energy-sensitive detectors and identified based on energy loss and time of flight (tof) information; emitted neutrons were detected with the Modular Neutron Array (MoNA) and the Large-area multi-Institutional Scintillator Array (LISA) with each array consisting of 144 $200\times 10\times 10$ cm³ bars of plastic scintillator. Measured $E(n)$, three-body decay energy and angular correlations. Deduced evidence for two-neutron sequential decay from a resonant state in ^{24}O .

 ^{24}O Levels

E(level)	Γ	L	Comments
7.65×10^3 20	<2 MeV	2	E(level): From observed resonance at 715 keV <i>110</i> (stat) <i>45</i> (sys) and known $S(2n)=6.93$ MeV <i>17</i> in AME-2020 (2021Wa16). Γ,L : The resonance energy, width and L-transfer were extracted from the best fit to the three-body decay energy spectrum based on Monte-Carlo simulations. Decays by a two-neutron sequential cascade to ^{22}O g.s. via an intermediate state in ^{23}O at 45 keV, based on measured energy and angular correlations. Each decay proceeds by emission of an L=2 neutron. Neither a di-neutron nor phase-space models were able to reproduce these correlations (2015Jo14).