^{1}H(^{24}O,^{23}O) 2014Ts04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171, 1 (2021)	1-Jun-2020

Other: 2015Jo14 – ^{2}H(^{24}O,2n^{22}O), E=83.4 MeV/nucleon – sequential neutron decay through intermediate state of ^{23}O.

Based on XUNDL: Compiled by B. Singh (McMaster), Oct 28, 2014.

Target: Liquid hydrogen H_2; ^{24}O beam, E=62 MeV/nucleon, was produced by fragmentation of ^{40}Ar primary beam, E=95 MeV/nucleon, bombarding a ^{9}Be target at RIKEN facility. The reaction products were analyzed by fragment separator RIPS, energy loss and TOF methods. The ^{24}O beam was tracked using two multiwire drift chambers. γ rays were detected by an array of 48 NaI(Tl) detectors. The mass and charge of the fragments following the ^{1}H+^{24}O reaction were analyzed using Bρ-TOF-ΔE technique, by using two multiwire drift chambers for Bρ, plastic scintillator charged particle hodoscope for TOF and energy-loss information. Neutrons were detected using a plastic scintillator placed at a distance of 4.7 m from the target. Measured (^{22}O)n coincidence. The decay energy spectrum was reconstructed from the measured four momenta of ^{22}O fragment and emitted neutron. A resonance was observed at a decay energy of 50 keV, which corresponded to the first excited state of ^{23}O decaying by neutrons. Shell-model calculations.

^{23}O Levels

E(level)	J^π	L	C^2S	Comments
0.0	$1/2^+$			J^π: From Adopted Levels.
2.78×10^3 *13*	$5/2^+$	2	4.1 *4*	E(level): deduced from measured E(resonance)=50 keV *3* (2014Ts04), and S(n)(^{23}O)=2730 keV *130* (2017Wa10). L,J^π: from longitudinal momentum distribution. σ_{1n}(expt)=61 mb *6* (2014Ts04). C^2S: deduced from experimental σ and single-particle σ calculated using distorted wave impulse approximation (DWIA) and eikonal approximation.