$^{1}H(^{14}O,t)$ 2016Su05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, J. E. Purcell and C. G. Sheu	NP A968, 71 (2017)	1-Jan-2017

2016Su05: XUNDL dataset compiled by TUNL, 2016.

The authors studied the low-lying structure of ^{12}O using the $^{1}H(^{14}O,t)$ reaction. A beam of 51 MeV/nucleon ^{14}O, produced by fragmenting a ^{16}O beam in a beryllium target, was ray-traced onto a cryogenic 7.1 mg/cm^2 hydrogen target that was held within a set of mylar foils. Tritons produced in the reactions were detected using a set of four position sensitive ΔE-E telescopes from the MUST2 array. At very forward angles (θ<1.6°) particles were detected using a Si-Si-Plastic (ΔE-ΔE-E) telescope.

Excitation energies were constructed from the missing mass, which was deduced from the triton energy and angular distributions, ΔE_x=±100 keV(syst) was achieved. Four peaks in the excitation spectrum were deduced at E_x=0, 1.62, 4.2 and 7.0 MeV. A DWBA analysis was used to analyze the data and to constrain the J^π values.

2009Su14: XUNDL dataset compiled by TUNL, 2009.

The authors measured ^{14}O(p,t) at E(^{14}O)=51 MeV/nucleon using a gas hydrogen target mounted in the SPEG/GANIL target chamber and using the MUST2 array to detect the triton recoils. The energy and angular distributions of tritons were measured, in coincidence with ^{10}C recoils following decay of the unbound ^{12}O ejectiles. A distorted wave analysis of the angular distributions is given, as well as, discussion on the breakdown of Z=8 shell closure.

These early results E_x=0±0.3 and 1.8±0.4 MeV and Γ=0.6±0.5 and 1.2±0.6 MeV, respectively, were found in agreement with the later results of (2016Su05).

^{12}O Levels

E(level)‡	J^π	Γ	L†	Comments
0.0	0^+	<72 keV	0	Γ: From (2012Ja11).
1.62×10^3 *11*	0^+	1.2 MeV *7*	0	E(level): From E=1.62 MeV *3*(stat) *10*(syst). Γ: From Γ=1.2 MeV *1*(stat) *+3−7*(syst). Discussion is given that considers any evidence that this state may be a doublet. No evidence as such is found in the present results.
4.2×10^3	1^-	2.2 MeV	1	
7.0×10^3		2.2 MeV	0,1,2	

† From DWBA analysis.

‡ From (2016Su05).