

$^2\text{H}(^{72}\text{Zn}, ^3\text{He})$  **2015Mo22**

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 188,1 (2023)	17-Jan-2023

Adapted from compiled dataset for XUNDL database by E.A. McCutchan (NNDC, BNL), March 25, 2016.

**2015Mo22:**  $^{72}\text{Zn}$  beam of  $E=38$  MeV/nucleon from fragmentation of a primary  $^{76}\text{Ge}$  beam on a  $733\text{-}\mu\text{m}$   $^9\text{Be}$  target. Reaction products selected with the LISE spectrometer at GANIL facility. The  $^{72}\text{Zn}$  beam (with purity of 90.6%) then impinged on a deuterated polypropylene target with thickness of  $0.26$  mg/cm<sup>2</sup>. Measured  $^3\text{He}$  spectra and  $\sigma(\theta)$  using four  $20\mu\text{m}$  silicon-strip detectors and four Must2 telescopes, and identified by measurement of time-of-flight and  $\Delta E-E$ , with FWHM=680 keV. Deduced L-transfers and spectroscopic factors by analyzing data using DWBA calculations, and comparison to shell model calculations using *fpgd* valence space.

 $^{71}\text{Cu}$  Levels

E(level)	$J^{\pi\dagger}$	$L^{\ddagger}$	$C^2S^{\#}$	Comments
$11 \times 10^1$ 19	$3/2^- \& 5/2^-$	1+3	0.8,1.4	E(level): assumed to be a doublet consisting of $3/2^-$ ground state and $5/2^-$ , 534 keV state. From energy and L-transfer considerations, known level at 454, $1/2^-$ could also be a part of this composite peak, but <b>2015Mo22</b> provide arguments, based on comparison with much weaker population of 1110, $1/2^-$ level, as compared to $3/2^-$ g.s. in $^{69}\text{Cu}$ in ( $d, ^3\text{He}$ ), that this level is not expected to be populated strongly in the present work. $C^2S$ : 0.8 2 for $L=1$ , $3/2^-$ ( $\pi p_{3/2}$ ); 1.4 6 for $L=3$ , $5/2^-$ ( $\pi f_{5/2}$ ), with the assumption of no contribution from the 454, $1/2^-$ level. Proposed configuration: 60% $\pi p_{3/2} \otimes 0^+$ , 14% $\pi p_{3/2} \otimes 2^+$ for the $3/2^-$ g.s.; 36% $\pi f_{5/2} \otimes 0^+$ , 22% $\pi f_{5/2} \otimes 4^+$ for the $5/2^-$ at 310 keV theoretical level energy.
$1.86 \times 10^3$ 15	$7/2^-$	3	1.4 2	
$3.24 \times 10^3$ 20	$7/2^-$	3	1.5 3	
$4.36 \times 10^3$ 17	$7/2^-$	3	3.7 6	E(level): wide peak which may contain more than one state, however, angular distribution is well fitted with only $L=3$ .
$5.92 \times 10^3$ 18	$1/2^+ \& 3/2^+$	0+2	0.4,3.0	$C^2S$ : 0.4 1 for $L=0$ , $1/2^+$ ; 3.0 5 for $L=2$ , $3/2^+$ . E(level): doublet.

$\dagger$  As assigned by **2015Mo22**.

$\ddagger$  From DWBA fit to  $\sigma(\theta)$  using DWUCK5 code.

$\#$  From comparison to DWBA calculations.