

$^1\text{H}(^{17}\text{Ne},^{15}\text{O}2\text{p})$  2018Wa07

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, G. C. Sheu	ENSDF	16-Jan-2018

2018Wa07: XUNDL dataset compiled by TUNL, 2018. Includes  $^1\text{H}, ^{12}\text{C}, ^{208}\text{Pb}(^{17}\text{Ne}, ^{15}\text{O}+2\text{p})$ .

A beam of 500 MeV/nucleon  $^{17}\text{Ne}$  ions, produced by fragmentation of a  $^{20}\text{Ne}$  beam at GSI facility, impinged on either a 213 mg/cm<sup>2</sup> polyethylene (CH<sub>2</sub>), 370 mg/cm<sup>2</sup> carbon or 199 mg/cm<sup>2</sup> lead target that was placed at the ALADIN-R3B setup target position. The complete kinematics of breakup protons and  $^{14,15}\text{O}$  reaction products was determined using a series of Si strip detectors, the ALADIN dipole magnet and two other  $\Delta E$ -E arrays centered at  $\theta=16.7^\circ$  and  $\theta=31^\circ$  with respect to the analyzing magnet exit, to detect  $^{14,15}\text{O}$  and proton reaction products, respectively.

Events with one or two protons detected in coincidence with oxygen isotopes were analyzed; the  $^{15}\text{O}+2\text{p}$  relative energy spectra were deduced for each target along with the 2p correlations. Considering the 1p and 2p separation energies are  $S_{1p}=1470$  keV and  $S_{2p}=933$  keV, the correlations are important for disentangling the reaction mechanism.

The aim of the analysis focused on understanding the dynamics of nuclear breakup and Coulomb dissociation of  $^{17}\text{Ne}$  for  $^{17}\text{Ne}\rightarrow^{15}\text{O}+2\text{p}$  reaction on  $^1\text{H}$ , C and Pb targets. The decay mechanism was analyzed for broad regions of excitation. The evaluator deduced excitation energies of states visible in figures 7a, 7b and 7c. Some discussion refers to previously reported states at  $E_{\text{res}}=0.83, 1.76$  and  $2.48$  MeV from analysis of the same data set reported in (2016Ma42).

The momentum distributions for the  $^{14}\text{O}$  and  $^{15}\text{O}$  recoils were also analyzed, for events with one or two coincident protons.

 $^{17}\text{Ne}$  Levels

E(level)	$J^\pi$	Comments
1764 <sup>†‡#@</sup> 12	$5/2^-$ <sup>†</sup>	From $E_{\text{res}}\approx 0.83$ MeV.
2692 <sup>†‡#@</sup> 21	$(3/2^-)$ <sup>†</sup>	From $E_{\text{res}}\approx 1.76$ MeV.
3415 <sup>†‡#</sup> 38	$(5/2^-)$ <sup>†</sup>	From $E_{\text{res}}\approx 2.48$ MeV.
$5.3\times 10^3$ <sup>‡#@</sup>		From $E_{\text{res}}\approx 4.4$ MeV.
$9.9\times 10^3$ <sup>‡#</sup>		From $E_{\text{res}}\approx 9.0$ MeV.

<sup>†</sup> From (2016Ma42).

<sup>‡</sup> Populated in  $^1\text{H}+^{17}\text{Ne}\rightarrow^{15}\text{O}+2\text{p}$ .

<sup>#</sup> Populated in  $^{12}\text{C}+^{17}\text{Ne}\rightarrow^{15}\text{O}+2\text{p}$ .

<sup>@</sup> Populated in  $^{208}\text{Pb}+^{17}\text{Ne}\rightarrow^{15}\text{O}+2\text{p}$ .