

Au($^{17}\text{Ne}, ^{17}\text{Ne}'\gamma$) 1997Ch09,2002Ch44

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

1997Ch09: A 60 MeV/nucleon ^{17}Ne beam, from the NSCL/A1200, impinged on a 532.7 mg/cm² Au target that was position at the center of an annular NaI γ -ray array covering $55^\circ < \theta < 125^\circ$. Scattered ^{17}Ne ions were detected and identified using a fast-plastic/slow-plastic phoswich detector that was placed at $\theta_{\text{lab}}=4.05^\circ$.

The 1275 keV 22 peak from photons corresponding to decay from the first excited state were analyzed, after Doppler correction of the spectrum, to obtain the Coulomb excitation yield and associated B(E2).

2002Ch44: A 58.7 MeV/nucleon ^{17}Ne beam, from the NSCL/A1200 was purified in a RPMS/Wein filter and delivered to a 112 mg/cm² Au target. Reaction products were detected using a position sensitive telescope that was configured to measure the momenta of ejectiles from Au($^{17}\text{Ne}, ^{17}\text{Ne}'\geq ^{15}\text{O}+2\text{p}$) reactions.

A reconstruction of the $^{15}\text{O}+2\text{p}$ events showed a clear indication of the sequential 2p decay of $^{17}\text{Ne}^*(1900 \text{ keV})$ via $^{16}\text{F}_{\text{g.s.}}$. No evidence for simultaneous 2p emission was found; a limit of $\Gamma_{2\text{p}}/\Gamma(^{17}\text{Ne}^*(1275)) < 0.0077$ was obtained. The article gives a discussion on the $J^\pi=1/2^+$ and $5/2^-$ state positions and highlights the $5/2+(?)$ state was previously reported at $E_x=1764 \text{ keV}$ (**add**). See other discussion in (**2007Be54**).

2010Li33: A 49.92 MeV/nucleon ^{17}Ne was produced by fragmentation of ^{20}Ne on a ^9Be target Lanzhou/RIBLL facility. The $^{15}\text{O}+2\text{p}$ momenta were measured using a position sensitive, multi-layer $\Delta E(\text{silicon})\text{-E}(\text{CsI})$ telescope. The data was analyzed to obtain the ^{17}Ne excitation energies and to search for evidence of ^2He emission from the visible groups. Figure 4 shows the $^{17}\text{Ne}^*$ excitation energies reconstructed from the $^{15}\text{O}+2\text{p}$ events; the peak energies do not appear to be deduced in the present experimental work, but they are compared with the energies deduced in (**1998Gu10**) and are found in reasonable agreement. See also (**2009XuZZ,2011LiZV,2016Li45**).

 ^{17}Ne Levels

E(level)	J^π	Comments
0	$1/2^-$	
1275 ^{†‡}	22 $3/2^-$	B(E2) $\uparrow=0.66 +18-25$ (2002Ch44).
1.76×10^3 [‡]		
1900 ^{†‡}	78 $5/2^-$	$T_{1/2}$: $T_{\text{mean}}=1.1 \text{ ps}$ 2 (2002Ch44). B(E2) $\uparrow=1.24 +18$ (2002Ch44). Decays $\approx 100\%$ via 1p emission to $^{16}\text{F}_{\text{g.s.}}$ (2002Ch44).
2.65×10^3 [‡]		
3.00×10^3 [‡]		
3.55×10^3 [‡]		
4.01×10^3 [‡]		
4.49×10^3 [‡]		
5.14×10^3 [‡]		
5.72×10^3 [‡]		
6.13×10^3 [‡]		
6.37×10^3 [‡]		

[†] Level energy deduced in (**2002Ch44**).

[‡] Peak observed in (**2010Li33**) and related to level reported in (**1998Gu10**).

Au($^{17}\text{Ne},^{17}\text{Ne}'\gamma$) 1997Ch09,2002Ch44 (continued) $\gamma(^{17}\text{Ne})$

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
1275 22	100	1275	$3/2^-$	0	$1/2^-$	$\Gamma_{2p}/\Gamma(^{17}\text{Ne}^*(1275)) < 0.0077$ (2002Ch44).

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