

$^{20}\text{Ne}(\alpha, ^8\text{He})$  1978Ke06,1983Wo01

Type	Author	Citation	History	Literature Cutoff Date
Full Evaluation	G. C. Sheu, J. H. Kelley	ENSDF		27-Jan-2020

1977KeZX:  $^{20}\text{Ne}(\alpha, ^8\text{He})$ , E=118 MeV; measured  $\sigma$ .  $^{16}\text{Ne}$  deduced levels, mass excess.

1978Ke06: A beam of  $E_\alpha \approx 177$  MeV ions, from the Lawrence Berkeley Laboratory 88-inch cyclotron, impinged on a  $^{20}\text{Ne}$  gas target that was enriched to >99.5% and had a thickness of 1.2 mg/cm<sup>2</sup> at a pressure of 310 Torr. Reaction products were collimated and magnetically analyzed in a quadrupole-sextupole-dipole (QSD) spectrometer; the time-of-flight through the spectrometer was also measured to aid in particle identification. The  $^{16}\text{Ne}^*(0, 1.69 \text{ MeV } 7)$  states were populated. The  $\Gamma_{\text{c.m.}}$  and the Q value of the  $^{16}\text{Ne}_{\text{g.s.}}$  state, the  $^{16}\text{Ne}$  mass excess, the total decay width and the di-proton branching ratio were deduced. The differential cross section for the ground state at  $\theta_{\text{lab}}=8^\circ$  was also measured.

1982WoZX:  $^{20}\text{Ne}(\alpha, ^8\text{He})$ , E=129 MeV; measured  $\sigma(\text{reaction})$ .  $^{16}\text{Ne}$  deduced mass. Enriched gas target, split-pole spectrograph.

1983Wo01: An alpha beam of 129 MeV, supplied by the Texas A&M University 224 cm cyclotron, impinged on a 99.5% enriched  $^{20}\text{Ne}$  gas target. Reaction products were detected in the focal plane of the spectrograph with a gas proportional counter backed by a Si detector. Particle identification was determined from  $\Delta E$ , E and time-of-flight parameters. The mass measurement was performed at  $\theta_{\text{lab}}=7.5^\circ$ . Coefficients of the isobaric multiplet mass equation (IMME) for the A=16 quintet were deduced.

 $^{16}\text{Ne}$  Levels

T: See (1978Ke06).

E(level) <sup>†</sup>	J <sup>π</sup> <sup>†</sup>	$\Gamma$	Comments
0	0 <sup>+</sup>	122 keV 37	<p>%p=100 T=2 E(<math>^{14}\text{O}+2\text{p}</math>) (MeV): We used 1401 keV 20 from (2017Wa10: AME-2016). See also 1.33 MeV 8 (1978Ke06) and <math>\approx 1.4</math> MeV (1983Wo01). <math>\Gamma</math>: The weighted value of (1983Wo01: 110 keV 40) and (1978Ke06: 200 keV 100). Applying penetrability corrections leads to a total decay width for <math>^{16}\text{Ne}</math> of 20 keV and a diproton branching ratio of 20%. Consideration of the uncertainties in the mass and width leads to the total decay width of 5-100 keV and the di-proton branching ratio is 10-90% (1978Ke06). <math>Q_0 = -60.15</math> MeV 8 (1978Ke06), which corresponds to <math>\Delta M = 23.92</math> MeV 8; see also <math>Q_0 = -60.197</math> MeV 23 and <math>\Delta M = 23.984</math> MeV 24 (1983Wo01). Analysis of the IMME suggests <math>d = 8</math> keV 5 (1978Ke06); see also <math>d = e = 4</math> keV 3 (1983Wo01). T=2 Analysis of the IMME suggests <math>d = 15</math> keV 6 (1978Ke06).</p>
1690 70	2 <sup>+</sup>		

<sup>†</sup> See (1978Ke06).