

$^{16}\text{O}(\text{p},\alpha)$

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	J. H. Kelley, C. G. Sheu and J. E. Purcell		NDS 198,1 (2024)	1-Aug-2024

- 1960Wh03: $^{16}\text{O}(\text{p},\alpha)$ E=8.59 MeV; measured reaction Q-value=-5206 keV 10.
- 1960Pa14: $^{16}\text{O}(\text{p},\alpha)$ E=362 MeV; studied ^{13}N production.
- 1961Ma15: $^{16}\text{O}(\text{p},\alpha)$ E=13.5-18.1 MeV at the Princeton cyclotron; measured $\sigma(\theta)$ for $\theta=15^\circ$ to 170° . Deduced $E(J^\pi)=0(1/2^-)$, 2.37 MeV($1/2^+$), 3.51 MeV ($3/2^-$) and 3.56 MeV ($5/2^+$).
- 1964Da02: $^{16}\text{O}(\text{p},\alpha_0)$ E=7.9 to 10.2 MeV; measured $\sigma(\theta)$ for $\theta=33^\circ$ to 166° .
- 1967Ac01: $^{16}\text{O}(\text{p},\alpha)$ E=38 MeV; measured $\sigma(\theta)$.
- 1967Ch41: E=13 MeV; measured σ to $^{13}\text{N}^*(0,2.36, 3.51+3.56 \text{ MeV})$.
- 1969Ga03: $^{16}\text{O}(\text{p},\alpha_0)$ E_p=38 MeV; measured $\sigma(\theta)$ for $\theta=15^\circ$ to 170° . Deduced integrated $\sigma=760 \mu\text{b}$ 30. PWBA analysis.
- 1970Gu06: $^{16}\text{O}(\text{p},\alpha_0)$ E=25-38 MeV; measured $\sigma(\theta)$ for $\theta=20^\circ$ to 170° .
- 1970Ko25: $^{16}\text{O}(\text{p},\alpha)$ E=665 MeV; measured $\sigma(E_\alpha)$.
- 1971Bu05: $^{16}\text{O}(\text{p},\alpha)$ E=21.3-38.5 MeV from the UCLA sector-focused cyclotron; measured $\sigma(\theta)$ for $\theta=70^\circ$.
- 1971Gu23: $^{16}\text{O}(\text{p},\alpha)$ E=19-45 MeV; measured $\sigma(E,\theta)$. Deduced reaction mechanism. $\alpha_{0,1,2+3,4}$.
- 1972Ma21: $^{16}\text{O}(\text{p},\alpha)$ E=54, 43.7, 50.5 MeV; measured $\sigma(E_\alpha,\theta)$ for $\theta\approx 15^\circ$ to 80° . Deduced level energies, L, J^π .
- 1973Mc12: $^{16}\text{O}(\text{p},\alpha)$ E=threshold=-7.7 MeV; measured $\sigma(E)$ via activation technique.
- 1973Ne12: $^{16}\text{O}(\text{p},\alpha_0)$ E(c.m.)=5.4-9.9 MeV; measured $\sigma(E)$. Deduced table of $\sigma(E)$ values, and deduced astrophysical rates.
- 1974Sk02: $^{16}\text{O}(\text{p},\alpha)$ E=9.0-20.4 MeV; measured $\sigma(E,\theta)$ for $\theta=25^\circ$ to 165° . Deduced ^{17}F levels.
- 1976Hi09: $^{16}\text{O}(\text{p},\alpha_{0,1})$ E=11.2-14.6 MeV; deduced ^{17}F states.
- 1977Gr17: $^{16}\text{O}(\text{p},\alpha)$ E=6.7-9.2 MeV; measured $\sigma(E)$ via activation technique. Deduced astrophysical reaction rates.
- 1985Ku13: $^{16}\text{O}(\text{p},\alpha)$ E=9.1 MeV; measured thick target γ -ray yields.
- 1985Va14: $^{16}\text{O}(\text{p},\alpha)$ E=21 MeV; measured thick target yields.
- 1986Ai04: $^{16}\text{O}(\text{p},\alpha)$ E<14.7 MeV; measured residual yields.
- 1986Sa33: $^{16}\text{O}(\text{p},\alpha)$ E=6.5-16.5 MeV; measured thick target yields. deduced $\sigma(E)$.
- 1989Wa16: $^{16}\text{O}(\text{p},\alpha)$ E=15-30 MeV; measured thick target yields via activation techniques. Evaluated radiopharmaceutical production.
- 1972Ga10: Develop pre-equilibrium emission model to explain the energy dependence of excitation functions.
- 1972Wo05: Computed astrophysically important reaction rates.
- 1999Ch50: $^{16}\text{O}(\text{p},\alpha)$ E \leq 250 MeV; calculated $\sigma(E)$, compared with data.
- 2003Ta17: $^{16}\text{O}(\text{p},\alpha)$ E \approx 6.5-19 MeV. IAEA report on ^{13}N production cross sections. Deduced $\sigma(E)$.
- 2021He14: $^{16}\text{O}(\text{p},\alpha)$. IAEA analysis of cross sections for PET/SPECT isotopes.

 ^{13}N Levels

E(level) [†]	J ^π [†]	T _{1/2} [†]	L [†]	Comments
0	1/2 ⁻		1	
2.36×10 ³	1/2 ⁺			E(level): (1967Ch41).
3.50×10 ³	(3/2 ⁻)			E(level): Doublet (1967Ch41).
6.38×10 ³	5/2 ⁺			E(level): From (1971Gu23).
7.39×10 ³	5/2 ⁻		3	
8.92×10 ³	1/2 ⁻			
9.52×10 ³	3/2 ⁻			
10.35×10 ³	(5/2 ⁻ , 7/2 ⁻)			
11.5×10 ³				
12.13×10 ³ 6	7/2 ⁻	≈300 keV	3	
12.75×10 ³ ? 6				E(level): Probably unresolved 12.6+12.9 MeV states.
13.48×10 ³ ?				Γ: Broad: few hundred keV.

[†] From (1972Ma21), where a J dependence is found in the angular distributions, except where noted.