^{12}C(p,α):res

History

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

1969Le18: ^{12}C(p,α) E=9.4-21.5 MeV; measured σ(E,θ) for θ=25° to 165°. Deduced resonance in $\alpha_{0,1}$ at E_p=14.231 MeV *4* with Γ=1.22 keV and Γ_{p0}=0.25 keV. The analysis is coupled with their associated (p,p) data. In (1970Aj04) the full collection of states given in Table 1 of (1969Le18) are associated with the (p,α) reaction; but this seems arbitrary given their θ=60° data shown in Fig 7. Isospin values are discussed. The results shown in Table 1 include ^{13}N states from E_x=13.96 to 19.88 MeV that were studied via phase-shift analysis. The complex of states around E_p=10.5 to 11 MeV were analyzed, but no results could be obtained.

1975Hi07: ^{12}C(p,α), ^{12}C(p,p) E=14.222-14.242 MeV; measured σ(E) at θ=175°. Analyzed $^{13}N^{*}$(14.07) mainly from (p,p). They deduced Γ=1.10 keV *9*, Γ_p=210 eV *11* and Γ_p/Γ=0.191 *17*. Analyzed other level decay properties such as partial widths, but they used branching ratios from (1973Ad02) with their Γ and Γ_p.

See also.

1964Ba29: ^{12}C(p,α) E=12.7-18.3 MeV; studied ^{9}B states.
1965Is05: ^{12}C(p,α), (p,p′) E=13 MeV; measured $\sigma(E_\alpha,\theta)$, $\sigma(E_p,\theta)$.
1967Ac01: ^{12}C(p,α) E=38 MeV; measured $\sigma(E_\alpha,\theta)$.
1967Cr05: ^{12}C(p,α) E=30.5-45.1 MeV, measured $\sigma(E_\alpha,\theta)$ for $\theta\approx$20° to 173°.
1969Ga03: ^{12}C(p,α) E=38 MeV; measured $\sigma(E_\alpha,\theta)$ for $\theta\approx$20° to 180°. PWBA analysis.
1970Gu06, 1971Gu23: ^{12}C(p,α_0) E=25-45 MeV; measured σ(E,θ) θ=20° to 170°. Discussed reaction mechanism.
1970Ko25: ^{12}C(p,α) E=665 MeV; measured σ(E).
1972Ma21: ^{12}C(p,α) E=54.1 MeV; measured $\sigma(E_\alpha,\theta)$ for θ=10° to 60°.
1980Da07: ^{12}C(p,α) E=45.2 MeV; measured $\sigma(E_\alpha,\theta)$ for θ=20° to 50°. Analyzed data via finite range DWBA.
1981Do13: 12C(pol. p,α_0) E=72 MeV; measured $\sigma(\theta)$, $A_y(\theta)$ for θ=20° to 150°. Deduced reaction mechanism.
1983Pe07: ^{12}C(p,α) E=42.77 MeV; measured $\sigma(E_\alpha,\theta)$ for θ=15° to 75°. Deduced optical model parameters.
1989Gu05: ^{12}C(p,α) E=50 MeV; measured $\sigma(\theta)$.

^{13}N Levels

E(level)†‡	J^π‡	Γ‡	E_{res} (keV)	Comments
13962?	3/2$^+$	140 keV	13035	Γ_{p0}=126 keV (1969Le18)
15064 *4*	3/2$^-$	1.10 keV *9*	14231 *4*	Γ_{p0}=210 eV *11* T=3/2 Γ,Γ_{p0}: From (1975Hi07) analysis (p,p) and (p,α) data. E(level): From (1969Le18); see also Γ=1.22 keV and Γ_p=0.24 keV from their analysis of (p,p) and (p,α) data.
15975?	7/2$^+$	100 keV	15220	Γ_{p0}=7.5 keV (1969Le18)
18232	1/2$^-$	300 keV	17670	Γ_{p0}=120 keV (1969Le18)
18352	3/2$^+$	100 keV	17800	Γ_{p0}=25 keV (1969Le18)
18960	(3/2$^-$,7/2$^+$)	15 keV	18459	$\Gamma_{p0}\approx$0.30 keV (1969Le18)
19.83×10^3	5/2$^-$	1 MeV	19.4×10^3	Γ_{p0}=175 keV (1969Le18)
19.88×10^3	3/2$^+$	520 keV	19.46×10^3	Γ_{p0}=208 keV (1969Le18)

† Level energies are deduced using E_p(res) and ^{12}C, p and ^{13}C masses from (2021Wa16: AME-2020). $E_x=S_p+E_{c.m.}$(relativistic).
‡ From phase-shift analysis in (1969Le18).