

$^{12}\text{C}(\alpha, ^3\text{He})$

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

- [1969Ga11](#): $^{12}\text{C}(\alpha, ^3\text{He}_0)$ E=56 MeV; measured $\sigma(\theta)$ for $\theta_{\text{c.m.}}=15^\circ$ to 60° ; deduced relative S for $(\alpha, ^3\text{He})$.
- [1972Ha08](#): $^{12}\text{C}(\alpha, ^3\text{He}_0)$ E=104 MeV; measured $\sigma(\theta)$ for $\theta_{\text{c.m.}}\approx 11^\circ$ to 70° ; deduced normalization factors, absolute S.
- [1973Sm03](#): $^{12}\text{C}(\alpha, ^3\text{He})$ E=139 MeV; measured $\sigma(E\alpha, \theta)$, $\sigma(E(^3\text{He}), \theta)$ for $\theta_{\text{c.m.}}\approx 5^\circ$ to 60° . Deduced spectroscopic strengths of $S(\text{g.s.})=0.69 \pm 15\%$ and $S(3.85)=0.40 \pm 15\%$.
- [1994Da32](#): $^{12}\text{C}(\alpha, ^3\text{He})$ E=90 MeV; measured $\sigma(\theta)$ for $\theta_{\text{c.m.}}=10^\circ$ to 90° ; deduced far-side component role, rainbow effect evidence.
- [1995Da08](#): $^{12}\text{C}(\alpha, ^3\text{He})^{13}\text{C}_{\text{g.s.}}$, E=90 MeV; measured $\sigma(\theta)$; deduced nuclear rainbow effect evidence, model parameters. Fuller's model, near/far-side formalism.
- [2021Ki07](#): $\text{C}(\alpha, ^{13}\text{C}\gamma)$ E=50-90 MeV; measured $\sigma(E_\alpha, E_\gamma)$ for $E_\gamma=3685, 3854$ keV.

Theory:

- [1974Ha32](#): $^{12}\text{C}(\alpha, ^3\text{He})$ E=139 MeV; calculated $\sigma(\theta)$, recoil effects.

 ^{13}C Levels

E(level)	J^π	L	S	Comments
0	$1/2^-$	1	1.38	E(level): See (1969Ga11 , 1972Ha08 , 1973Sm03 , 1994Da32 , 1995Da08). J^π, L, S : From DWBA analysis in (1972Ha08). See also $S=1.15-1.4$ in (1969Ga11).
3090				E(level): Reported in (1994Da32).
3685				E(level): Reported in (1994Da32).
3850				E(level): See (1983Sm03 , 1994Da32).