

$^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$

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

[1969Be90](#): $^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$ E=20 MeV; measured $\sigma(\theta_{\text{c.m.}})$ for $\theta \approx 40^\circ - 110^\circ$. Deduced Optical Model parameters.
[1972Ba52](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=28 MeV; measured $\sigma(\theta)$ for $\theta \approx 15^\circ - 90^\circ$. Deduced Optical Model parameters.
[1973Sc26](#): $^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$ E=34, 36 MeV; measured elastic and inelastic scattering for $\sigma(\theta)$ and $\theta \approx 15^\circ$ to 80° .
 Finite-range DWBA analysis.
[1976Po02](#): $^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$ E=4-13 MeV; measured $\sigma(\theta)$ for $\theta \approx 15^\circ - 90^\circ$, optical model analysis.
[1978Dr07](#): $^{13}\text{C}(\text{pol. } ^6\text{Li},^6\text{Li}),(\text{pol. } ^7\text{Li},^7\text{Li})$ E=9 MeV; E=28 MeV; measured $\sigma(\theta)$ for $\theta \approx 20^\circ - 100^\circ$.
[1979Ze01](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=40 MeV; measured $\sigma(\theta)$ for $\theta \approx 10^\circ - 70^\circ$.
[1987Co02](#), [1987Co16](#): $^{13}\text{C}(^7\text{Li},^7\text{Li}),(^7\text{Li},^7\text{Li}')$ E=34 MeV; measured $\sigma(\theta)$ for $\theta \approx 10^\circ - 170^\circ$. Folding model analysis.
[1988DeZT](#), [1992DeZQ](#), [1994De43](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=93 MeV; measured $\sigma(\theta)$ for $\theta = 14^\circ$ to 163° , analyzed rainbow effects.
[1989De34](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=93 MeV; measured $\sigma(\theta)$ for $\theta \approx 10^\circ - 120^\circ$ also studied $(^6\text{Li},^6\text{He})$. DWBA analysis.
[2000Tr01](#): $^{13}\text{C}(^7\text{Li},^7\text{Li})$ E=63, 130 MeV; measured elastic $\sigma(\theta)$ for $\theta_{\text{c.m.}} \approx 5^\circ$ to 70° . Also measured $^{13}\text{C}(^{14}\text{N},^{14}\text{N})$ for E=162 MeV, and several other reactions. Optical model analysis. Deduced global optical model parameters and applied results to $(^7\text{Be},^8\text{B})$ transfer reactions and the $^7\text{Be}(p,\gamma)$ problem.
[2004Ca46](#), [2004CaZZ](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=54 MeV, $^{13}\text{C}(^7\text{Li},^7\text{Li})$ E=63, 130 MeV; measured elastic scattering $\sigma(\theta)$ for $\theta = 10^\circ$ to 80° . Also measured $^{13}\text{C}(^7\text{Li},^8\text{Li})$ transfer reaction. Analyzed refractive scattering via optical model analysis.
[2012Li14](#): $^{13}\text{C}(^7\text{Li},^7\text{Li})$ E=34 MeV; measured elastic scattering $\sigma(\theta)$ for $\theta_{\text{c.m.}} = 10^\circ$ to 45° . DWBA analysis.
[1976St22](#): $^{13}\text{C}(^6\text{Li},d\alpha)$; calculated $d+\alpha$ angular correlations.
[1991Bo48](#): $^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$; analyzed utility of lithium beam studies for Rutherford backscattering analysis of materials.
[2018Xu01](#): $^{13}\text{C}(^7\text{Li},^7\text{Li})$; developed a global optical potential model for ^7Li scattering up to 200 MeV.
[2020Ch17](#): $^{13}\text{C}(^7\text{Li},^7\text{Li})$; developed a microscopic optical potential model for ^7Li scattering up to 450 MeV.
[2022Mi16](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=38 MeV; analyzed refractive scattering for lithium beams in a laser polarizing field.
[2022Xu14](#): $^{13}\text{C}(^6\text{Li},^6\text{Li})$ E=4-210 MeV; developed a global optical potential model for ^6Li scattering on $1p$ -shell nuclei.
[2023Ma02](#): $^{13}\text{C}(^6\text{Li},^6\text{Li}),(^7\text{Li},^7\text{Li})$; analyzed mass asymmetry and charge asymmetry effects in elastic scattering of light nuclei.
[2024Xu04](#): $^{13}\text{C}(^7\text{Li},^7\text{Li})$; developed a global optical potential model for ^7Li scattering on p -shell nuclei for E=4.5 to 132 MeV.

 ^{13}C Levels

E(level)	J^π [†]	Comments
0	$1/2^-$	E(level): Angular distributions analyzed in $(^6\text{Li},^6\text{Li})$ and $(^7\text{Li},^7\text{Li})$.
3.09×10^3 [‡]		L: L=1 $(^6\text{Li},^6\text{Li})$ (1973Sc26).
3.68×10^3 [‡]	$3/2^-$	$\delta_2 = -1.30$ (1987Co02).
7.55×10^3 [‡]	$5/2^-$	$\delta_2 = -1.00$ (1987Co02).

[†] From folding model analysis of ([1987Co02](#), [1987Co16](#)).

[‡] Angular distributions analyzed in coupled-channels $(^7\text{Li},^7\text{Li})$ analysis of ([1987Co02](#)).