^{12}C(^{7}Li,^{6}Li),(^{8}Li,^{7}Li)

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

1973Sc26: ^{12}C(^{7}Li,^{6}Li) E=34,36 MeV; measured $\sigma(\theta)$ for $\theta_{c.m.}$=15° to 70°. FRDWBA, deduced optical model parameters.
1979Ze01: ^{12}C(^{7}Li,^{6}Li) E=48 MeV; measured $\sigma(\theta)$ for $\theta_{c.m.}$=5° to 90°; deduced optical-model parameters. ^{13}N, ^{13}C deduced S-factors. Enriched targets, finite range DWBA analysis.
1982Ta23: ^{12}C(^{7}Li,^{6}Li) E=36,32,28 MeV; measured yield vs particle energy, $\sigma(\theta)$ for θ=7.5° to 50°, fusion σ, breakup σ vs E; deduced reaction mechanism.
1984Mo06: ^{12}C(pol. ^{7}Li,^{6}Li) E=21.1 MeV; measured $\sigma(\theta)$, $T_{20}(\theta)$, $T_{21}(\theta)$, $T_{22}(\theta)$ for $\theta\approx$30° to 110°. Optical model analysis.
1986Co02: ^{12}C(^{7}Li,^{6}Li) E=34 MeV; measured particle spectra, $\sigma(\theta)$ for θ=20° to 120°; deduced potential parameters. ^{13}C levels deduced S-factors.
1989Be28: ^{12}C(^{8}Li,^{7}Li) E=13 MeV; measured $\sigma(\theta)$, σ(E(^{7}Li)); deduced astrophysical abundance implications.
1989BeZY: ^{12}C(^{8}Li,^{7}Li) E=14.3 MeV; measured $\sigma(\theta)$. Radioactive beams.
1993Be22: ^{12}C(^{8}Li,^{7}Li) E≈13-20 MeV; measured $\sigma(\theta)$.

Theory:
1973DuZP: ^{12}C(^{7}Li,^{6}Li) E=36 MeV; calculated σ(E,θ), σ(E(^{6}Li),θ).
1973Ku12: ^{12}C(^{7}Li,^{6}Li) E=36 MeV; calculated $\sigma(\theta)$, cluster model DWBA analysis.
1976Ku06: ^{12}C(^{7}Li,^{6}Li) E=36 MeV; analyzed anomalous $\sigma(\theta)$.
1988Ke07: ^{12}C(^{7}Li,^{6}Li) E=34 MeV; analyzed $\sigma(\theta)$; deduced reaction mechanism.
2002Ke04: ^{12}C(pol. ^{7}Li,^{6}Li) E=34 MeV; measured σ(E,θ), analyzing powers. Coupled channels analysis.
2002Ke11: ^{12}C(^{7}Li,^{6}Li) E=34 MeV; analyzed $\sigma(\theta)$. ^{13}C deduced neutron binding potential radius, possible core deformation.

^{13}C Levels

E(level)	J^{π}[‡]	L[#]	S[‡]	Comments
0[†]	1/2^{-}	0,1,2	0.65 *6*	S: See also 0.80 (1979Ze01,1993Be22).
3090[†]	1/2^{+}	1	0.75 *8*	S: See also 0.9 (1973Sc26: estimated), and 0.44 (1979Ze01).
3680	3/2^{-}		0.17	E(level),J^{π},S: From (1979Ze01).
3850[†]	5/2^{+}	1,2,3	0.68 *10*	S: See also 1.0 (1973Sc26: estimated), 0.74 (1979Ze01), 1.1 (1993Be22).
6.86×10^{3}				
7600				E(level): Unresolved multiplet.
9.5×10^{3}				

[†] Angular distributions to these states were studied; some higher-energy states were also observed (1973Sc26,1979Ze01,1986Co02).
[‡] From DWBA analysis of spectroscopic factors in (1986Co02), except where noted. In (1993Be22) S are deduced from normalization to FRDWBA calculations assuming (^{8}Li,^{7}Li$_{g.s.}$) is the dominant transfer mode. We assume ^{8}Li$_{g.s.}\rightarrow{}^{7}$Li$_{g.s.}$+n has S=1.0.
[#] From (1973Sc26).