

${}^4\text{He}(\alpha,\alpha)$ 2004Ti06

Type	Author	History	Citation	Literature Cutoff Date
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- 1968Be02: ${}^4\text{He}(\alpha,\alpha)$ $E_\alpha=182.2-191.5$ keV, measured $\sigma(E_\alpha)$. ${}^8\text{Be}$ deduced Q, Γ -level.
 1972Ba83: ${}^4\text{He}(\alpha,\alpha)$ $E=30-70$ MeV, measured $\sigma(E,\theta)$. Deduced phase shifts. ${}^8\text{Be}$ deduced levels, J, π .
 1974Ch45: ${}^4\text{He}(\alpha,\alpha)$ $E=18.00-29.50$ MeV, measured $\sigma(E,\theta)$. Deduced phase shifts $L=0, 2, 4, 6$.
 1976Fo03: ${}^4\text{He}(\alpha,\alpha)$ $E=650, 850$ MeV, measured $\sigma(\theta)$.
 1976Hi04: ${}^4\text{He}(\alpha,\alpha)$ $E=54.96-55.54$ MeV, measured $\sigma(E,\theta)$. ${}^8\text{Be}$ deduced resonance parameters.
 1978Hi04: ${}^4\text{He}(\alpha,\alpha)$ $E=32.6-35.4$ MeV, measured $\sigma(E,\theta)$. ${}^8\text{Be}$ deduced resonance parameters.
 1978Na16: ${}^4\text{He}(\alpha,\alpha)$ $E=158.2$ MeV, measured $\sigma(\theta)$.
 1980Be14: ${}^4\text{He}(\alpha,\alpha)$ E At 4.32, 5.07 GeV/c, measured $\sigma(\theta)$.
 1980Ma30: ${}^4\text{He}(\alpha,\alpha)$ $E=0.5-70$ MeV, analyzed phase shift data.
 1985Bo35: ${}^4\text{He}(\alpha,\alpha)$ $E=12.3, 29.5$, analyzed phase shift data. Deduced parameter zero position dependent resonance location.
 1992Go21: ${}^4\text{He}(\alpha,\alpha)$ $E_{C.M.}=11.39$ MeV, measured $\sigma(\theta)$.
 1992Wu09: ${}^4\text{He}(\alpha,\alpha)$ $E\approx$ threshold, measured relative yield. Deduced ${}^8\text{Be}$ resonance splitting mechanism.
 1994Co16: ${}^4\text{He}(\alpha,\alpha)$ $E=197$ MeV, measured $\sigma(\theta)$. DWIA analysis.
 1994Mo27: ${}^4\text{He}(\alpha,\alpha)$ $E\approx 7-35$ MeV, analyzed $\sigma(\theta)$. Deduced model potential parameters.
 1995Yi01: ${}^4\text{He}(\alpha,\alpha)$ $E=0-25$ MeV, analyzed phase shifts vs. E . Deduced R-matrix parameters.
 1996Ku08: ${}^4\text{He}(\alpha,\alpha)$ $E=\text{low}$. ${}^8\text{Be}$ level deduced Γ .
 1996St25: ${}^4\text{He}(\alpha,\alpha)$ $E_{C.M.}=158, 200$ MeV, measured $\sigma(\theta)$. DWBA analysis.
 2002Bh03: ${}^4\text{He}(\alpha,\alpha)$ $E\approx 0.4-33$ MeV, analyzed phase shifts. ${}^8\text{Be}$ deduced R-matrix parameters.
 2003Av04: ${}^4\text{He}(\alpha,\alpha)$ $E<35$ MeV, analyzed $\sigma(\theta)$. Deduced density distribution.
 2003De37: ${}^4\text{He}(\alpha,\alpha)$ $E\approx 0-40$ MeV, analyzed σ , phase shifts, rotational band features. Deduced resonance and antiresonance effects.

 ${}^8\text{Be}$ Levels

E(level)	J^π	$T_{1/2}$	L	Comments
0.0		5.57 eV 25		Γ : from (1992Wa09), other value $\Gamma=6.8$ eV 17 (1968Be02).
3.18×10^3	2^+	1.5 MeV	2	
11.5×10^3	$3\ 4^+$	4.0 MeV 4	4	E(level): from 11.4 MeV 3 (1959Br71) and 11.7 MeV 4 (1974Ch45). Γ : from (1974Ch45). Other value ≈ 4.3 MeV (1967Ke10).
16627	$2\ 2^+$	108.1 keV 4	2	$\Gamma\alpha\approx\Gamma$. E(level): from weighted average of 16623 keV 3 and 16630 keV 3. Γ : from weighted average of 107.7 keV 5 and 108.5 keV 5.
16921	$2\ 2^+$	74.0 keV 3	2	$\Gamma\alpha\approx\Gamma$. E(level): from weighted average of 16925 keV 3 and 16918 keV 3. Γ : from weighted average of 74.4 keV 4 and 73.6 keV 4.
19.9×10^3	4^+	<1 MeV	4	$\Gamma\alpha/\Gamma\approx 0.96$
20.1×10^3	2^+		2	
20.2×10^3	0^+	<1 MeV	0	$\Gamma\alpha/\Gamma<0.5$
22.2×10^3	2^+		2	
25.2×10^3	2^+		2	
25.5×10^3	4^+		4	$\Gamma=\text{broad}$.
$28.\times 10^3?$	(6^+)	≈ 20 MeV	6	
$57.\times 10^3?$	(8^+)	≈ 73 MeV		