^{40}Ca(α,γ):resonances 2012Ro13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 190,1 (2023)	20-Jun-2023

2012Ro13: E=3.0-4.6 MeV alpha beams were produced from the 4-MV Dynamitron tandem accelerator at the RUBION Laboratory of the University of Bochum. Targets were metallic ^{40}Ca (99.5% pure) on Cu backings. γ rays were detected with a 12-in. by 12-in. single-crystal NaI(Tl) detector. Measured γ-ray yields using 4π summing technique. Deduced levels, resonance energies, strengths. Calculated astrophysical reaction-rates. Comparison with previous works.

Others: see also (α,γ):E=res for resonances up to E(level)=15950 based on measured γ transitions.

^{44}Ti Levels

E(level)[†]	$\omega\gamma$ (eV)[‡]	Comments
8036.0 *27*	0.47 *7*	E_{res}(c.m.)=2910.0 *27*.
8072.0 *23*	0.090 *14*	E_{res}(c.m.)=2945.0 *23*.
8123 *7*	0.109 *18*	E_{res}(c.m.)=2995 *7*.
8134.0 *23*	0.157 *25*	E_{res}(c.m.)=3007.0 *23*.
8195 *3*	0.40 *6*	E_{res}(c.m.)=3068 *3*.
8237 *4*	0.050 *8*	E_{res}(c.m.)=3110 *4*.
8254.0 *18*	0.119 *18*	E_{res}(c.m.)=3127.0 *18*.
8320.0 *20*	0.19 *3*	E_{res}(c.m.)=3193.0 *20*.
8382 *3*	0.47 *8*	E_{res}(c.m.)=3255 *3*.
8419.0 *25*	0.67 *10*	E_{res}(c.m.)=3293.0 *25*.
8465.0 *23*	0.50 *8*	E_{res}(c.m.)=3338.0 *23*.
8524 *3*	0.64 *10*	E_{res}(c.m.)=3396 *3*.
8569 *3*	0.79 *12*	E_{res}(c.m.)=3442 *3*.
8639.0 *17*	1.77 *24*	E_{res}(c.m.)=3512.0 *17*.
8695 *3*	0.19 *3*	E_{res}(c.m.)=3568 *3*.
8728 *4*	0.30 *5*	E_{res}(c.m.)=3601 *4*.
8763.0 *13*	1.22 *20*	E_{res}(c.m.)=3636.0 *13*.
8838.0 *19*	0.69 *11*	E_{res}(c.m.)=3711.0 *19*.
8895.0 *26*	1.35 *21*	E_{res}(c.m.)=3768.0 *26*.
8964.0 *21*	2.1 *3*	E_{res}(c.m.)=3836.0 *21*.
8999.0 *14*	1.57 *25*	E_{res}(c.m.)=3871.0 *14*.
9046 *6*	0.80 *12*	E_{res}(c.m.)=3920 *6*.
9076.0 *25*	2.1 *3*	E_{res}(c.m.)=3948.0 *25*.
9118 *5*	0.81 *13*	E_{res}(c.m.)=3991 *5*.
9155.0 *17*	3.7 *7*	E_{res}(c.m.)=4028.0 *17*.
9243.0 *14*	9.0 *12*	E_{res}(c.m.)=4116.0 *14*.

[†] From S(α)(^{44}Ti)+E_{res}(c.m.), where S(α)=5127.1 *7* (2021Wa16) and E_{res}(c.m.) converted from E_α on resonance.

[‡] Resonance strength extracted from measured excitation functions, determined relative to the strength of the 1.84 MeV resonance in the reaction ^{40}Ca(p,γ) (2012Ro13).