^{98}Mo(α,α') 1975Bu04,2015Yo04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

1975Bu04: E(α)=32.2 MeV from the variable-energy cyclotron of the CSIR Pretoria. Target was 0.89-1.16 mg/cm^2 98.8% enriched metallic ^{98}Mo. Scattered particles were detected with semiconductor detectors (FWHM=100 keV). Measured $\sigma(\theta)$. Deduced levels, J, π, L-transfers, deformation parameters, transition strengths from DWBA analysis. Uncertainty on cross sections is 20% for strong and 50% for weak states.

2015Yo04 (also 2013Yo07): E(α)=240 MeV from Texas A&M K500 superconducting cyclotron. Target=self−supporting target foils 5-8 mg/cm^2 of >96% enriched ^{98}Mo. Measured Eα, Iα, $\alpha(\theta)$ using multipole-dipole-multipole (MDM) spectrometer. Deduced Isoscalar giant resonances (ISGMR, ISGDR, ISGQR and ISGOR), and E0, E1, E2 and E3 strengths. Comparison with Spherical Hartree-Fock-based random-phase approximation calculations. DWBA analysis of $\sigma(\theta)$ data. 2013Yo07 deals with the study of isoscalar giant monopole resonances (ISGMR).

1972Ma56: E(α)=30.87 MeV from Institute of Physical and Chemical Research in Japan. Scattered particles were detected with a Si(Li) detector (FWHM=100 keV). Measured $\sigma(\theta)$. Deduced deformation parameters, transition strengths for g.s., first 2$^+$ and 3$^-$ states.

Others:

1979Pa21: E(α)=30-50 MeV. Measured $\sigma(\theta)$.

1990Bu25: E(α)=45 MeV. Measured $\sigma(\theta)$.

^{98}Mo Levels

E(level)[†]	J$^\pi$	Γ	L[#]	β_L[#@]	Comments
0					
790			2	0.146	β_L: 0.145 *7* (1972Ma56). 1990Bu25 deduce β_2=0.142 (coupled-channel) and 0.150 from DWBA calculations. B(E2)(W.u.)=21 *6* (1975Bu04), 20.7 *20* (1972Ma56).
1440			(2)	0.033	B(E2)(W.u.)=1.0 *3*.
1530			(4)	0.034	L: the shape of $\sigma(\theta)$ is consistent with L=4 but the phase is in disagreement (1975Bu04). B(E4)(W.u.)=1.6 *5*.
2030			3	0.155	β_L: 0.160 *12* (1972Ma56). B(E3)(W.u.)=27 *8* (1975Bu04), 28 *4* (1972Ma56).
2220			4	0.034	B(E4)(W.u.)=1.6 *5* (1975Bu04).
2360			4	0.071	B(E4)(W.u.)=7.1 *20* (1975Bu04).
2580			4	0.060	B(E4)(W.u.)=5.1 *15* (1975Bu04).
2690			6	0.042	B(E6)(W.u.)=4.8 *14* (1975Bu04).
2870			4	0.034	B(E4)(W.u.)=1.6 *5* (1975Bu04).
3020			4	0.067	B(E4)(W.u.)=6.4 *19* (1975Bu04).
3220			3	0.033	B(E3)(W.u.)=1.2 *4* (1975Bu04).
13.85×10^3[‡] *24*	2$^+$[‡]	4.68[‡] MeV *34*			%E2 EWSR=85 *14* for ISGQR (2015Yo04).
15.7×10^3[‡]	0$^+$[‡]	6.5[‡] MeV			%E0 EWSR=83 for ISGMR (2015Yo04).
16.0×10^3[‡] *3*	1$^-$[‡]	10.9[‡] MeV *11*			%E1 EWSR=26 *3* for ISGDR (2015Yo04).
21.5×10^3[‡] *4*	3$^-$[‡]	4.2[‡] MeV *3*			%E3 EWSR=61 *8* for ISGOR (2015Yo04).
24.2×10^3[‡]	0$^+$[‡]	5.6[‡] MeV			%E0 EWSR=14 for ISGMR (2015Yo04).
27.4×10^3[‡] *7*	1$^-$[‡]	10.8[‡] MeV *30*			%E1 EWSR=49 *8* for ISGDR (2015Yo04).

[†] From 1975Bu04 for levels up to 3220 keV.

[‡] From 2015Yo04. Total Isoscalar E0 EWSR=103% *12*, E1 EWSR=70% *8*, E2 EWSR=85% *14*, and E3 EWSR=61% *8* (2015Yo04).

[#] From DWBA analysis of measured cross sections (1975Bu04).

[@] Deduced (by evaluators) from β_LR values in 1975Bu04 if R=1.4×A$^{1/3}$.