^{167}Er(γ,γ'),(e,γ) 1970Jo16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 191,1 (2023)	22-Aug-2023

1970Jo16: bremsstrahlung and electrons from National Bureau of Standards (now NIST) 4-MeV electron Van de Graaff accelerator. Natural erbium targets with thickness of ≈5 g/cm^2 for (γ,γ') and ≈18 mg/cm^2 for electroexcitation. Measured excitation functions by incrementing the bombarding energy and measuring the subsequent isomeric decays with NaI(Tl) scintillators. Deduced radiative widths and multipolarities of electromagnetic transitions from ratios of electron-to-photon cross sections.

1996Sc11: (γ,γ'), E(end-point)=3.5, 4.6 and 5.8 MeV bremsstrahlung. Measurement of B(M1)↑=3.1 *11* between ≈1.9 MeV and 4.3 MeV. For excitation energy above 3.9 MeV, appreciable Ml strength is found indicating a spreading of the scissors mode for an interval of ≈2 MeV.

Other:

1997En05: analyzed experimental information on the scissors mode and B(M1) strength distributions in heavy odd-mass nuclei, including previous experimental results available for ^{167}Er, using a statistical model approach, with the conclusion that scissors mode present in deformed, heavy odd-mass nuclei with the strength expected from systematics, but a significant part can escape detection in the (γ,γ') NRF experiments because of the strong fragmentation, and other experimental arrangements.

^{167}Er Levels

E(level)	J^π[†]	$T_{1/2}$	$g\Gamma_0\Gamma_{\gamma1}/\Gamma$ (eV)[‡]	Comments
0	7/2$^+$			
207.801 *5*	1/2$^-$	2.28 s *3*		$T_{1/2}$: from 1970Jo16. $T_{1/2}$=2.269 s *6* in the Adopted Levels.
2320 *15*				Measured σ(e,γ)=0.039 μb *16*.
2530 *15*	+		0.013 *3*	Measured σ(e,γ)=0.043 μb *17*.
2725 *15*	+		0.026 *7*	Measured σ(e,γ)=0.056 μb *23*.
2950 *15*	+		0.040 *10*	Measured σ(e,γ)=0.065 μb *26*.
3080 *15*	+		0.073 *18*	Measured σ(e,γ)=0.16 μb *6*.
3255 *15*	+		0.054 *14*	Measured σ(e,γ)=0.10 μb *4*.
3355 *15*	+		0.076 *19*	Measured σ(e,γ)=0.19 μb *8*.
3475 *15*				

[†] For excited states above 208 keV, parity assignments are from multipolarities of electromagnetic transitions, which are deduced from ratios of electron-to-photon cross sections, where photon absolute cross sections were obtained by measuring the NaI(Tl) spectra with corrections for detection efficiencies, and computing the number of isomer decays observed per count using decay-scheme data for the isomer. Spins can range from 3/2 to 11/2. For the g.s. and the the 207.8-keV isomer, J^π assignments are from the Adopted Levels.

[‡] g is the statistical weight factor, $\Gamma_{\gamma1}$ is the partial width for decay to the 207.8 isomer.