Coulomb excitation 2014We13

History							
Туре	Author	Citation	Literature Cutoff Date				
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024				

Adapted from a dataset in the XUNDL database compiled from 2014We13 by E.A. McCutchan (NNDC, BNL), November 18, 2014. 2014We13: E=145 MeV/nucleon ³³Ar beam was produced in fragmentation of a primary ³⁶Ar beam at E=450 MeV/nucleon from the heavy-ion synchrotron SIS at GSI, on a 4 g/cm² thick ⁹Be target. ³³Ar products were selected in flight on an event-by-event basis using the Fragment Separator (FRS) in achromatic mode. Reaction target was 386 mg/cm² thick ¹⁹⁷Au. γ rays were detected with a subset of the RISING detectors consisting of fourteen HPGe EUROBALL cluster detectors and the HECTOR array of eight BaF₂ detectors. Scattered ³³Ar nuclei were tracked and identified using the Lund-York-Cologne Calorimeter (LYCCA) consisting of twelve Si-CsI(Tl) detectors used as a Δ E-E telescope and placed 3.4 m downstream of the Au target. Additional tracking and particle identification performed with position-sensitive time projections chambers placed in front of the Au target and a position-sensitive double-sided Si detector located close behind the Au target. Measured E γ , I γ , particle- γ -coin. Deduced yields and B(E2) strengths for the 1360-keV, (3/2⁺) level and the 1804-keV, (5/2⁺) level. Comparison with shell-model calculations using a modified USD interaction. Analyzed systematics of B(E2) values in even-even T_z=±1, ±2 sd shell nuclei.

³³Ar Levels

B(E2) \uparrow values under comments are deduced by the evaluators from B(E2)(W.u.) of de-exciting γ transitions as deduced by 2014We13 from measured cross section.

E(level) [†]	$J^{\pi \ddagger}$	Comments	
0 1360 <i>3</i> 1804 <i>6</i>	$ \frac{1/2^+}{(3/2^+)} \\ (5/2^+) $	3(E2)↑=0.0081 <i>19</i> 3(E2)↑=0.0109 <i>30</i>	

[†] From $E\gamma$ data.

[‡] From the Adopted Levels.

$\gamma(^{33}\text{Ar})$

B(E2)(W.u.) values under comments are deduced by 2014We13 from measured total Coulomb cross section and using the DWEIKO code to translate cross section into a B(E2) value. For 1804γ, a small branching ratio of 2.34% 40 for 1804 to 1360 transition measured by 2004Cl02 has been taken into account by 2014We13. Quoted values are normalized to B(E2)(W.u.)=8.5 8 for the 1970-keV, 2⁺ level to g.s. transition in ³⁶Ar, as taken by 2014We13 from the Adopted Levels of ³⁶Ar in ENSDF database (2012 update). However, the value listed in ENSDF database (2012 update) is actually 8.2 5 for that transition.

E_{γ}^{\dagger}	E _i (level)	\mathbf{J}_i^{π}	\mathbf{E}_{f}	\mathbf{J}_f^{π}	Mult.	Comments
1360 <i>3</i>	1360	(3/2 ⁺)	0	$\frac{1/2^+}{1/2^+}$	[M1+E2]	B(E2)(W.u.)=6.4 <i>15</i> (2014We13)
1804 6	1804	(5/2 ⁺)	0		[E2]	B(E2)(W.u.)=5.8 <i>16</i> (2014We13)

[†] From 2014We13.

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Level Scheme

