

**Pb( $^{36}\text{Mg}, ^{36}\text{Mg}'\gamma$ ) 2016Do03**

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	21-May-2021

**2016Do03:** measurement of B(E2) and deformation lengths for the first  $2^+$  state by Coulomb excitation and nuclear inelastic scattering, respectively. Beam= $^{36}\text{Mg}$  at 223 MeV/nucleon for lead target and 218 MeV/nucleon for carbon target produced at RIBF-RIKEN in  $^9\text{Be}(^{48}\text{Ca},\text{X}),E=345$  MeV/nucleon primary reaction, followed by separation of ions of interest using BigRIPS fragment separator and ZeroDegree spectrometer for the analysis of events in terms of atomic number (Z) and mass-to-charge (A/Q) ratio based on  $B\rho\text{-}\Delta E\text{-tof}$  method. Beam purity was  $\approx 16\%$ . The gamma rays were detected by DALI2 array of 186 NaI(Tl) scintillation detectors covering angles of  $18^\circ$  to  $146^\circ$ . Measured  $E_\gamma$ ,  $I_\gamma$ ,  $^{36}\text{Mg}\text{-}\gamma\text{-coin}$ , cross section. Deduced B(E2) from data for Pb target (dominated by Coulomb excitation) and deformation length from data for carbon target (dominated by nuclear inelastic scattering) by comparing the measured cross sections to those calculated by ECIS97 coupled-channel code using the rotational model. Comparison with shell-model calculations.

 $^{36}\text{Mg}$  Levels

E(level)	$J^\pi$	$T_{1/2}$	Comments
0	$0^+$		
666 5	$2^+$	41 ps +12-8	B(E2) $\uparrow=0.053$ 12 (2016Do03) $\sigma=15.1$ mb 16 for the carbon target and 72 8 for the lead target (2016Do03). Assumed feeding of 6% 6 from the higher possible levels was subtracted by authors. Deformation length $\delta_N=1.93$ fm 11 (2016Do03) from data with carbon target, which implies deformation parameter $\beta_N=0.49$ 3, assuming $R=1.2\alpha^{1/3}$ fm. Deformation length $\delta_C=2.03$ fm 22 (2016Do03) from data with lead target, which implies $\beta_C=0.51$ 6 and B(E2) $\uparrow=0.0528$ 121, using $\beta_C=\delta_C/R$ , and. $T_{1/2}$ : deduced by evaluator from B(E2) $\uparrow$ .

 $\gamma(^{36}\text{Mg})$ 

$E_\gamma$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.	Comments
666 5	666	$2^+$	0	$0^+$	[E2]	B(E2)(W.u.)=15.0 35 $E_\gamma$ : average of 666 5 for the carbon target and 665 5 for the lead target.

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Level Scheme

