

$^{64}\text{Zn}(d,^2\text{He})$  2008Gr10

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 178, 41 (2021).	12-Nov-2021

2008Gr10 (also 2006Gr08): E(d)=183 MeV beam provided by the Groningen-Orsay (AGOR) accelerator facility at KVI. The two protons in the  $^1\text{S}_0$  state were detected and momentum analyzed with the Big-Bite magnetic spectrometer (BBS) and its position-sensitive detector. FWHM=115 keV. The nuclear matrix elements for  $\beta\beta$  (double- positron) decay mode of  $^{64}\text{Zn}$  were evaluated using present data from (d, $^2\text{He}$ ) reaction and  $^{64}\text{Ni}(^3\text{He,t})^{64}\text{Cu}$  data from literature. DWBA analysis of angular distributions.

The uncertainties in B(GT $^+$ ) values are statistical only. Systematic uncertainty is 14% for levels below 4 MeV and 20% for higher levels.

 $^{64}\text{Cu}$  Levels

Summed B(GT $^+$ ) strength=1.60 5 (2008Gr10).

E(level)	J $^\pi$	B(GT $^+$ )	Comments
0	1 $^+$	0.059 8	$d\sigma/d\Omega=0.056$ mb/sr 8.
$4.0\times 10^2$ 20	1 $^+$	0.182 34	E(level): broad peak at 200-600 keV consists of several unresolved levels including the 344, 1 $^+$ level. $d\sigma/d\Omega=0.17$ mb/sr 3.
730 $^\dagger$	1 $^+$	0.023 5	$d\sigma/d\Omega=0.022$ mb/sr 5.
950	1 $^+$	0.140 12	$d\sigma/d\Omega=0.131$ mb/sr 11.
1520	1 $^+,2^-$	0.033 6	$d\sigma/d\Omega=0.032$ mb/sr 5.
1700	2 $^-$		
2290 $^\dagger$	2 $^-$		
2660 60	1 $^+,2^-$ $^\ddagger$	0.193 20	$d\sigma/d\Omega=0.189$ mb/sr 15.
2780 60	1 $^+,2^-$ $^\ddagger$	0.095 13	$d\sigma/d\Omega=0.093$ mb/sr 11.
3190	1 $^+$	0.512 21	$d\sigma/d\Omega=0.476$ mb/sr 20.
4010		0.036 10	J $^\pi$ : weak cross section did not allow J $^\pi$ assignment, angular distribution shows contribution from 2 $^-$ . $d\sigma/d\Omega=0.044$ mb/sr 6.
4190	1 $^+$	0.090 8	$d\sigma/d\Omega=0.084$ mb/sr 8.
4390	1 $^+$	0.087 8	$d\sigma/d\Omega=0.081$ mb/sr 8.
4670	1 $^+,2^-$	0.067 11	$d\sigma/d\Omega=0.069$ mb/sr 7.
4760	1 $^+$	0.089 8	$d\sigma/d\Omega=0.082$ mb/sr 8.
5060 $^\dagger$	2 $^-$		

$^\dagger$  Weakly populated level.

$^\ddagger$  1 $^+,2^-$  from DWBA analysis of combined (2660+2780) peak at 2.7 MeV 1.