EXP1904: Reference reaction - Analyzing #458

Analyzing # 436 (Открыта): Reference reaction: Data analysis

Fixation of parameters related to experimental setup

04/23/2020 12:05 AM - Vratislav Chudoba

Status:	Открыта	**Start date:**	04/22/2020
Priority:	Нормальный	**Due date:**	
Assignee:	Ivan Muzalevsky	**% Done:**	100%
Category:		**Estimated time:**	0.00 hour
Target version:			

Description

Provide essential parameters related to experimental setup basing on results obtained in task 397 (and its subtasks).

The parameters should be provided in the form of the table in separate comment.

History

#1 - 04/27/2020 04:39 PM - Ivan Muzalevsky

- % Done changed from 0 to 100

The initial parameters:

number	parameter	value	unit
1	beam energy	beamDet thickness: 630 micron of Si	
2*	thin SSD calibration parameters	pars for 2 thin detector (ssd_20u_2.cal) from issue 284 pars for 1 3 and 4 detectors from issue 391 (SSD_20u_1_cal.txt, SSD_20u_3_cal.txt SSD_20u_4_cal.txt)	
3	thick SSD calibration parameters	issue 391	
4	central DSD calibration parameters	issue 391	
5	thin detector front dead layer	not used	mcm
6	thin detector rear dead layer	not used	mcm
7	thick SSD front dead layer	issue 391	mcm
8	thin detector position	issue 293 with offset (0.5,-1.3,-3)	mm
9	thick detector position	issue 293 with offset (0.5,-1.3,-3)	mm
10	central DSD position	(0,**0**,323)	mm
11	target density (same pressure as for ^{7}H)	0.0020646	g.cm^{-3}
12	target density, low	0.001005	g.cm^{-3}
13**	full target thickness	6	mm
14	target mylar window thickness	3.5	mcm
15	target stainless steel window thickness	6	mcm
16***	CsI calibration parameters	not used	

17	map of thickness for thin SSD	issue 392	
18	target selection	circle of **9 mm radius** with center in (0.4673,0.0262) mm at the target plane	
19	MWPC positions	MWPC1 (-0.9,-3,-815) MWPC2 (0.3,-1.55,-270)	mm

Summed spectrum from all 4 telescopes for thin target

Green lines - coincidence with 9Li

mm_thin.png

The position of the g.s. is **0.1 MeV** which was estimated as a mean value of the main peak of the black histogram

Separated spectra from 4 telescopes for thick target

Red lines - ground state selection

mm_diff.png

Ground state positions (means of red histograms):

-0.094 MeV (360 events)
0.178 MeV (336 events)
-0.059 MeV (339 events)
0.178 MeV (362 events)

Summed spectrum from all 4 telescopes for thick target

Green lines - coincidence with 9Li

mm_thick.png

From the summed spectrum the g.s. position was calculated as a statistical average from 4 values:
position = (-0.094*360+0.178*336+-0.059*339+0.178*362)/1397 = **0.05MeV**

Without time-amplitude cuts for the central telescope

Summed spectrum from all 4 telescopes for thin target

Green lines - coincidence with 9Li and time-amp cuts for CT

mm_thin.png

Separated spectra from 4 telescopes for thick target

mm_diff.png

Ground state positions (means of red histograms):

-0.126 MeV (776 events)
0.151 MeV (634 events)
-0.108 MeV (712 events)
0.154 MeV (711 events)

Summed spectrum from all 4 telescopes for thick target

Green lines - coincidence with 9Li and time-amp cuts for CT

mm_thick.png

From the summed spectrum the g.s. position was calculated as a statistical average from 4 values:
position = (-0.126*776+0.151*634-0.108*712+0.154*711)/2833 = **0.01MeV**