3/4/82

More on HET window A end

RAM — 1 mil mylar ≈ 18.61 μm Si using protons — comparing dE/dx
3/4 mil = 2.4 mg/cm² from a measurement — using α particles & Lunte R-E table

Now try comparing for ^{16}O : @ 10 MeV/nuc

We have 2 3/4 mil mylar × 1.026 = 71.7 μm = .00717 cm × 1.26 g/cm³
= 9.03 mg/cm² mylar

Northcliffe Schilling

@ 10 MeV/nuc ^{16}O dE/dx = 2.670 MeV/mg/cm² in mylar
= 2.112 " " in Al } ratio = 1.264

@ 11 MeV/nuc ^{16}O dE/dx = 2.474 " " in mylar
= 1.962 " " " Al } 1.261

@ 12 MeV/nuc ^{16}O dE/dx = 2.306 " " in mylar
= 1.833 " " " Al } 1.258

I know has Al, Si comparison for protons

@ 10 MeV/nuc $\left(dE/dx\right)_{Al} / \left(dE/dx\right)_{Si} = \frac{33.965}{34.794} = 0.976$

∴ $\frac{\text{mylar}}{Al} = 1.26$ $\frac{Al}{Si} = 0.976$ ⇒ $\frac{\text{mylar}}{Si} = 1.291$

∴ 9.03 mg/cm² mylar equivalent to 11.658 mg/cm² Si = 50.03 μm Si

use 50 μm equivalent Si for HET A end window

For B end have 3½ mil mylar ≈ 64 μm Si

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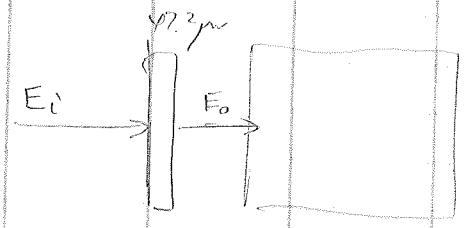
HET window correction

window is assumed to be 47.2 μm equivalent Si



Oxygen

E_o/m	R_o	$R_o + 47.2$	E_i mev/m	E_i round	R_i	$R_i - 47.2$	E_o	$E_o \times m$ mev
9.7	179.31	226.51	11.17	11.2	227.64	180.44	9.74	155.80
12.7	277.50	324.70	13.99	14.0	324.98	277.78	12.71	203.33
23.0	775.86	823.06	23.79	24.0	835.61	788.41	23.21	371.40
42.0	2239.63	2286.83	42.50	42.0	2239.63	2192.43	41.50	663.97
66.0	4989.17	5036.37	66.35	66.0	4989.17	4941.97	65.65	1050.34
94.0	9319.17	9366.37	94.27	94.0	9319.17	9271.97	93.73	1499.67
124.0	15152.61	15199.81	124.22	124.0	15152.61	15105.41	123.78	1980.47

Carbon

8.3	178.13	225.33	9.56	9.6	227.04	179.84	8.35	100.18
10.9	281.65	328.85	11.93	12.0	332.00	284.80	10.97	131.65
19.0	734.10	781.30	19.69	20.0	802.71	849.91	20.66	247.93
36.0	2265.48	2312.68	36.42	36.0	2265.48	2218.28	35.58	426.90
61.0	5778.15	5825.35	61.28	61.0	5776.15	5730.95	60.72	728.62
85.0	10397.50	10444.70	85.22	85.0	10397.50	10350.30	84.78	1017.37
105.0	15086.44	15133.64	105.19	105.0	15086.44	15039.24	104.81	1257.75

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HET window A and

Window 1/4 mil Al mylar

Thermal blanket sheldahl black coated Kapton .002" } 1.25 g/cm³
Al mylar .0005" } ⇒ .0079 g/cm²

Total ≃ 2 3/4 mil "mylar"

RAPA "3/4 mil mylar ≃ 12-13 μSi equivalent"

⇒ 2 3/4 ≃ 44 – 48 μm Si

use 46 μm @ 13° ⇒ 47.2 μm Si

2 3/4 mil mylar = .0070 cm mylar = 70 μm × 1.0263 (sec 13°) = 71.8 μm mylar