

## RMS beta Fabrication of Beta Particles Detector for RMS

150

beta RMS(radiation monitoring system) beta  
beta  
40 mm, 가 1.5 mm .  
mylar RMS  
ULS( ) discriminator counter .  
RMS beta beta ( Sr/ Y - 90)  
45.41 % .

### Abstract

The beta particles detector for RMS(radiation monitoring system) was fabricated to detect charged beta particles. The plastic scintillator was cutted, shaped, polished to make plastic disk for beta particles. The diameter of completed plastic scintillator disk is 40 mm and thickness is 1.5 mm. The mylar film and aluminium foil were used the front of plastic scintillator to intercept light and moisture. The completed plastic detector for RMS consist of the discriminator and counter were made by ULS(Co.). The absolute efficiency of plastic detector was 45.51 % for beta particles(Sr/Y - 90).

1.

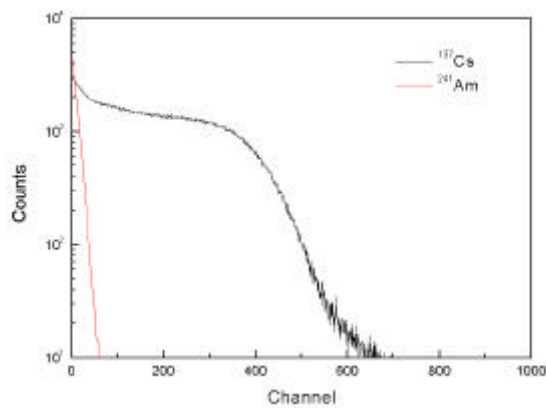
RMS(radiation monitoring system)[1]

RMS

. RMS 가  
 . RMS beta  
 . Beta  
 가  
 PPO(diphenyloxazole), p-terphenyl, stilbene  
 1950  
 Schorr Torney [2]  
 , crystal  
 , photon beam monitor 가  
 [3-5].  
 RMS beta [6,7].  
 polishing beta  
 RMS beta  
 beta beta *Sr/Y - 90* RMS  
 2.  
 2.1.  
 Beta Bicron  
 (BC-408) . 1  
 polyvinyltoluene  
 1.032 g/cc 1.58 . 1 Bicron BC-408  
 Compton  
 Compton  
 RMS beta 1.5 mm, 40  
 mm 가 . 2 , , molding,  
 cutting, polishing . 10 mm  
 45 × 45 mm<sup>2</sup>  
 ( 2 (a)). 40 mm

1. BC-408

	Polyvinyltoluene		1.032 g/cc
	1.58		-60 ° C +60 ° C
Light Output	Anthracene 64 %	Rise Time	0.9 ns
Decay Time	2.1 ns		425 nm



1. BC-408

가 가

가  
가 mm

2 (b)

(SAKAI ML-360)

polishing

가  
가 round가

가  
가

polishing

mounting

cold mounding

50 mm mounting

cold mounting

가

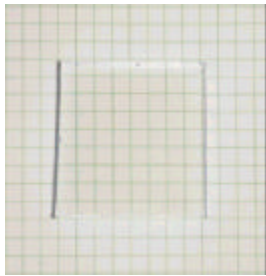
2 (c) cold mounting

. Mounding

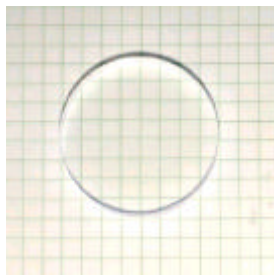
(BUEHLER ISOMET 1000)

2 mm

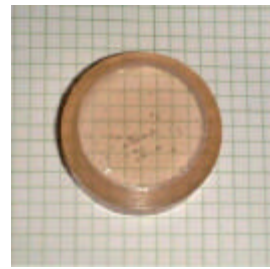
#500 wheel, polishing machine, #1,500  
 1.6 mm, 가, polishing cloth  
 $Al_2O_3$  powder, polishing cloth  
 grade polishing, PMT, optical  
 Polishing, 2 (d), polishing  
 1.5 mm, 2 (e), 40 mm, 가



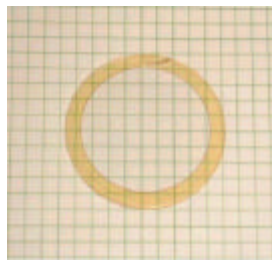
(a)



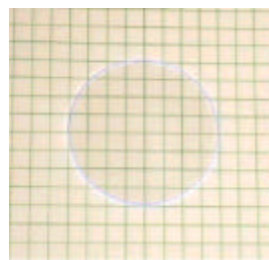
(b)



(c)



(d)



(e)

2. , (a) ,  
 (b) 40 mm , (c) cold mounting ,  
 , (d) polishing ,  
 (e) .

2.2.

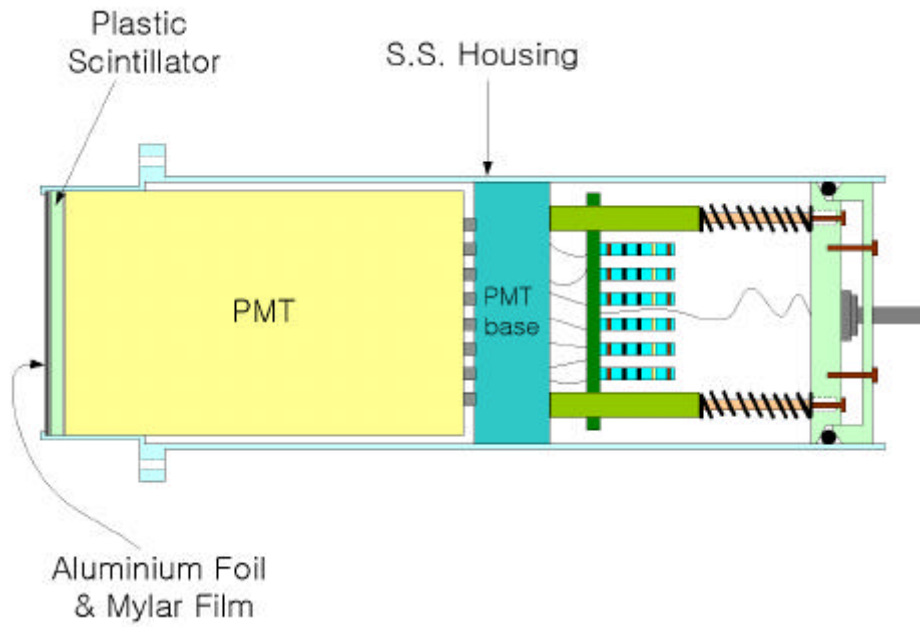
beta 가  
 mylar (mm<sup>2</sup>)  
 (17 μm) PMT alpha  
 , mylar  
 3 RMS beta  
 , PMT base O ring

2.3.

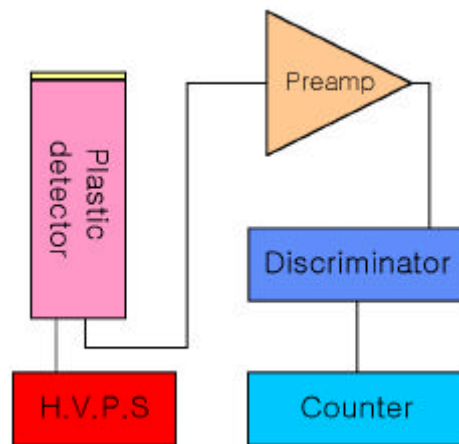
4 5 beta  
 . PMT discriminator  
 1300 V 가  
 . Beta beta Sr/ Y- 90  
 ULS ( ) power supply (ULS0020), discriminator (ULS4020) 4 ch  
 counter/rate meter (ULS3000) beta (Sr/ Y- 90)  
 3860 Bq(4 , 1982 3 26 ) 28.5 .

$$A = A_0 e^{-\lambda t}$$

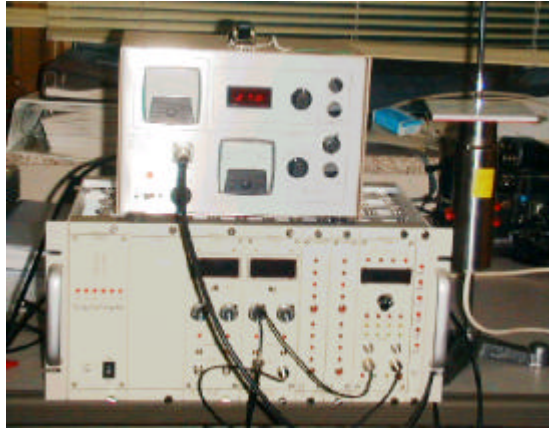
A<sub>0</sub> A t  
 A<sub>0</sub> 3860 Bq  
 t 2335 Bq .  
 2 RMS 1 beta .  
 background 94.10 /m . background  
 PMT dark current .  
 beta 1  
 . beta 4  
 2  
 background beta 1060.40 /s  
 45.41% .



3. Beta



4. RMS beta



5. Beta

2. 1 beta

	1	2	3	4	5	6	7	8	9	10	
Background	97	102	97	87	95	90	89	105	86	93	94.10
New Plastic Scintillator	63083	63820	63816	63683	63516	63501	63404	63717	63926	63780	63624

3.

RMS beta  
 , polishing  
 40 mm, 가 1.5 mm . RMS beta  
 ( Sr/ Y- 90 ) 45.41 %  
 beta beta

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