

Title	Year	Journal Name, Vol(), pages	Author	Summary
Gamma rays following muon capture Label: <b>HJEvan1973</b>	1973	Nuclear Physics A (207) 379- 400	H.J.Evans	<p><u>Introduction/ Theory:</u></p> <p>The energy and intensity of <math>\gamma</math>-rays following capture of muons by Si, Ti, Mn, Fe, Co, Ni, Y, Ag and Au were measured.</p> <p>MuCAP on Fe &amp; Ni =&gt; mode of de-excitation by the emission of neutron and proton</p> <p>MuCAP on Ti =&gt; <math>\gamma</math>-rays mode alone</p> <p>if <math>\mu</math> and p are at rest (<math>BE_p \sim</math> negligible) leads to neutron KE <math>\sim 5.2</math> MeV</p> <p>Prompt gamma (gate =15 ns)</p> <p>Delayed gamma (gate =100 ns)</p> <p>Gamma absolute intensities:</p> <p>Lyman Series =&gt; corresponds to each muon stopped</p> <p>Balmer series =&gt; total 2p-1s transition</p> <p><u>Aims:</u></p> <p><u>Method:</u></p>

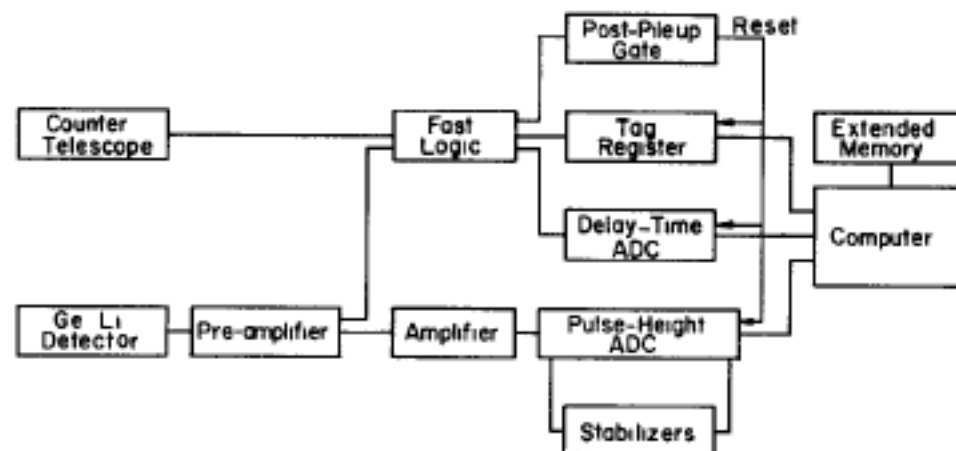


Fig. 1. A block diagram of the experimental set-up.

Isotopic distribution of elements used as targets

Target element	Isotopic mass	Relative abundance (%)	Target element	Isotopic mass	Relative abundance (%)
Si	28	92.2	Co	59	100
	29	4.7		Ni	58
	30	3.1	60		26.2
Ti	46	8.0	61		1.3
	47	7.3	62	3.7	
	48	74.0	64	1.2	
	49	5.5	Y	89	100
	50	5.2		Ag	107
Mn	55	100	109		48.65
	Fe	54	5.8	Au	197
56		91.7			
57		2.2			
58		0.3			

The values in this table were taken from ref. 21).

## Results:

Nuclei	Neutron	$\gamma$ -rays (keV)	Probability (%)
<sup>28</sup> Si	0n	-	-
	1n	844.0, 1014.0	17.0
	2n	-	-
<sup>48</sup> Ti	0n	121.4, 130.9, 370.3, 520.3, 780.1	11.1
	1n	583.1, 807.8	13.0
	2n	146.9, 216.6, 227.9	8.1
	3n	364.2, 719.9	5.2
<sup>55</sup> Mn	0n	-	-
	1n	834.8, 989.0	49.0
	2n	1006.0	4.0
<sup>56</sup> Fe	0n	314.8	1.3
	1n	858.0, 1528.2	14.2
	2n	377.5	1.6
	1n + 1p	836.4	2.9
<sup>59</sup> Co	0n	-	-
	1n	459.6, 810.6, 864.1, 1265.1, 1323.3	51
	2n	692.0	3.2
	3n	847.1	6.3
<sup>58</sup> Ni	0n	-	-
	1n	1223.2, 1377.4	9.0
	2n	846.9	9.3
<sup>89</sup> Y	0n	-	-

	1n	897.9, 1799.0	37.0
	2n	355.8, 485.0	5.7
<sup>109</sup> Ag	0n	-	-
	1n	433.9, 497.4, 614.7	20.0
	2n	-	-
	3n	717.4, 614.7	6.4
	4n	-	-
	5n	555.6	5.7
<sup>197</sup> Au	0n	-	-
	1n	333.1, 355.8, 393.4, 521.2, 1091.2	36.0
	2n	-	-
	3n	483.2, 603.6	3.2