Caliberation Curve

Name: Athira Sreejith
Roll no: MS18033
email: ms18033@iisermohali.ac.in
Lab session: 26/11/2021

December 9, 2021

Contents

---

1 Aim

To obtain the calibration curve and estimate the energies of the peaks in gamma ray spectrum of Co-60, Cs-137 and Na-22

2 Data taken and Observations

In the previous experiment, the total counts vs LLD data was collected for 3 different sources, namely C0-60,Cs-137 and Mn-54 at the best operating voltage obtained in the previous experiment (650 V). This spectrum is used to find a calibration curve.

2.1 Finding Calibration Curve

The energy for Co-60 peaks are 1.173 and 1.332 respectively for baseline voltages $L_1 = 3.5$ and $L_2 = 3.95$.
Difference in Energy $\Delta E = 1.332 - 1.173 = 0.159$
Difference in baseline, $\Delta L = 0.45$
$1ch = 0.05V = 0.05\frac{\Delta E}{\Delta L} MeV = 0.0177$
Using the value of the peak energies, a linear fit is obtained for Energy vs LLD plot.
The equation of line obtained is y = -0.353x + 0.063.
Without intercept, the slope obtained is 0.338 for co-60 alobne, while the slope is 0.302 including peak of Cs at 662 KeV. The peaks and the estimated energies are as follows:

Co-60	
Peak LLD	Energy
0.25	0.0845
0.75	0.2535
2.65	0.8957
Cs-137	
Peak LLD	Energy
2	0.604
0.1	0.0302
0.6	0.1812
1.4	0.4228
Na-22	
Peak LLD	Energy
1.55	0.4681
0.25	0.0755
0.95	0.2869
3.8	1.1476

3 Result

The Energy-LLD relation was linear, and the energies were estimated accordingly.