

Table 2.9

Count rates in the peaks of a background spectrum obtained with a high-purity germanium detector ($\epsilon_r = 25\%$): (a) without shielding; (b) with the whole detector assembly (including dewar) shielded by lead 5-cm thick.

E (keV)	Origin of photons	Count rate (10^{-3} s^{-1})	
		a	b
32.2	Ba x	653	
36.4	Ba x	160	
46.5	^{210}Pb (Ra)	20	
63.3	^{214}Th	13	
72.8/75.0	Pb x	888	26
85/87	^{234}Th	345	13
92.5	^{234}Th	190	19
129.1	^{234}Ac (Th)	65	
185.7	^{235}U		8
186.2	^{226}Ra	160	
209.3	^{228}Ac (Th)	105	
2238.6	^{212}Pb (Th)	1122	10
241.0	^{224}Ra (Th)	100	
241.9	^{214}Pb (Ra)	155	3
270.2	^{228}Ac (Th)	110	
277.4	^{208}Tl (Th)	48	
295.2	^{214}Pb (Ra)	392	5
300.1	^{212}Pb (Th)	85	
327.6	^{228}Ac (Th)	71	
332.4	^{228}Ac (Th)	10	
338.3	^{228}Ac (Th)	250	
351.9	^{214}Pb (Ra)	702	10
409.5	^{228}Ac (Th)	44	
438.8	^{40}K Escape	17	
452.8	^{212}Bi (Th)	15	
463.0	^{228}Ac (Th)	90	
510.8	^{208}Tl (Th)	151	
511.0	Annihilation	111	56
562.3	^{228}Ac (Th)	17	
583.1	^{208}Tl (Th)	530	4
609.3	^{214}Bi (Ra)	678	10
661.7	^{137}Cs	14	
665.5	^{214}Bi (Ra)	20	
727.2	^{212}Bi (Th)	116	
755.2	^{228}Ac (Th)	13	
763.1	^{208}Tl (Th)	8	
768.4	^{214}Bi (Ra)	63	
772.2	^{228}Ac (Th)	19	
785.9	^{214}Pb (Ra)	32	
794.7	^{228}Ac (Th)	71	
806.2	^{214}Bi (Ra)	14	

Experimental setup

Table 2.9 (continued)

E (keV)	Origin of photons	Count rate (10^{-3} s^{-1})	
		a	b
835.5	^{228}Ac (Th)	23	
840.0	^{228}Ac (Th)	19	
860.4	^{208}Tl (Th)	67	
904.5	^{228}Ac (Th)	10	
911.1	^{228}Ac (Th)	389	6
934.1	^{214}Bi (Ra)	40	
949.8	^{40}K Escape	25	
964.6	^{228}Ac (Th)	67	
969.1	^{228}Ac (Th)	223	3
1001.0	^{234}Pa (U)	10	1
1120.3	^{214}Bi (Ra)	179	5
1155.2	^{214}Bi (Ra)	18	
1173.2	^{60}Co		4
1238.1	^{214}Bi (Ra)	66	3
1281.0	^{214}Bi (Ra)	15	
1332.5	^{60}Co		3
1377.7	^{214}Bi (Ra)	45	2
1385.3	^{214}Bi (Ra)	11	
1401.5	^{214}Bi (Ra)	14	
1408.0	^{214}Bi (Ra)	27	
-1460.8	^{40}K	2183	91
1495.8	^{228}Ac (Th)	10	
1509.3	^{214}Bi (Ra)	22	
1583.2	^{214}Bi (Ra)	13	
1588.0	^{228}Ac (Th)	30	1
1592.7	^{208}Tl Escape	46	4
1620.6	^{212}Bi (Th)	19	
1630.4	^{228}Ac (Th)	20	1
1661.3	^{214}Bi (Ra)	11	
1729.6	^{214}Bi (Ra)	30	2
1764.5	^{214}Bi (Ra)	156	
1847.4	^{214}Bi (Ra)	21	1
2103.7	^{208}Tl Escape	54	5
2118.6	^{214}Bi (Ra)	12	1
2204.2	^{214}Bi (Ra)	45	3
2293.4	^{214}Bi (Ra)	4	
2447.9	^{214}Bi (Ra)	13	1
2614.7	^{208}Tl (Th)	352	30

detector or that direct or scattered radiation from a nearby nuclear facility has increased.

Some low-energy peaks may be due to resonance fluorescence in the materials surrounding the crystal. In the above example Pb X rays from the