Amersham International Limited
Amersham UK

Certificate of measurement of alpha-emitting radioactive reference source

A 2744

Description

Principal radionuclide: Americium-241

Product code: AMR.22

Source number: 6392RA

Measurement

Reference time: 1200 GMT on 27 April 1982

Rate of emergence of alpha particles from the front surface: 1.18×10^4 alpha particles per minute

Estimated disintegration rate of the active material: 2.32×10^4 disintegrations per minute

Method of measurement:
The rate of emergence of alpha particles was measured in a proportional counter under conditions of 2-pi geometry.

Accuracy

The overall uncertainty in the rate of emergence of alpha particles quoted above was: ± 2 %

The limits of overall uncertainty were taken as the arithmetic sum of the uncertainty due to random variations, calculated at the 99.7% confidence level, and the estimated systematic uncertainties in the measurement.

Physical Data

Radionuclide	Recommended half-life	Important alpha particle energies MeV
Americium-241	433 years	5.442(12.5%), 5.484(85.2%)
Curium-244	17.8 years	5.763(23.6%), 5.806(76.4%)
Plutonium-239	24,100 years	5.103(11%), 5.142(15%), 5.155(73%)

Remarks

The ratio of the disintegration rate to the rate of emergence of alpha particles was estimated to be 1.96. This ratio includes the conversion from 2-pi to 4-pi geometry and the backscatter in the source. It assumes that there is no self-absorption in the active material.

The disintegration rate so derived does not include the disintegration rate of any traces of active material that may be present in the source other than on the front face. (Such activity is normally less than 5% of the total activity.)

A gold surface barrier alpha spectrometer was used to show that the measured alpha resolution (full width at half maximum height) was less than 20keV.

Approved

Physics Department

For Managing Director

Amersham

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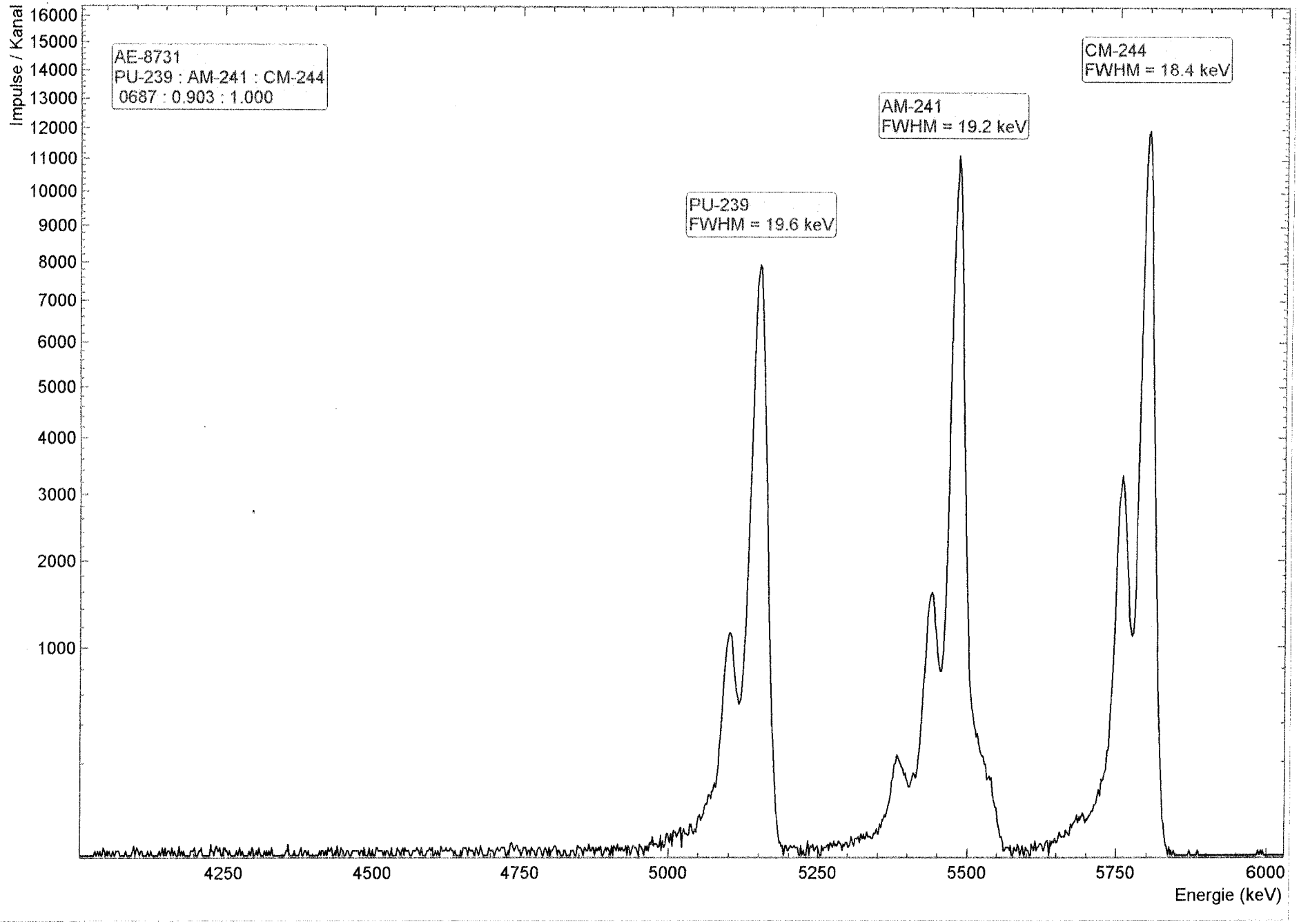

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21 March 2001

CERTIFICATE

No. CO 36176 – HL 229

for Unsealed Radioactive Source/s

Source Type: Checking Source/s

Product code	AMR14
Drawing	VZ-1679
Quantity	2 off
Source no/s.	HL 229, [redacted]
Nuclide/s	Americium-241

Measurement Data

Nominal activity	each 40 kBq
Reference date	5 March 2001
Traceability*	Not applicable

Contamination Test

Test method*	I
Test passed on	16 March 2001

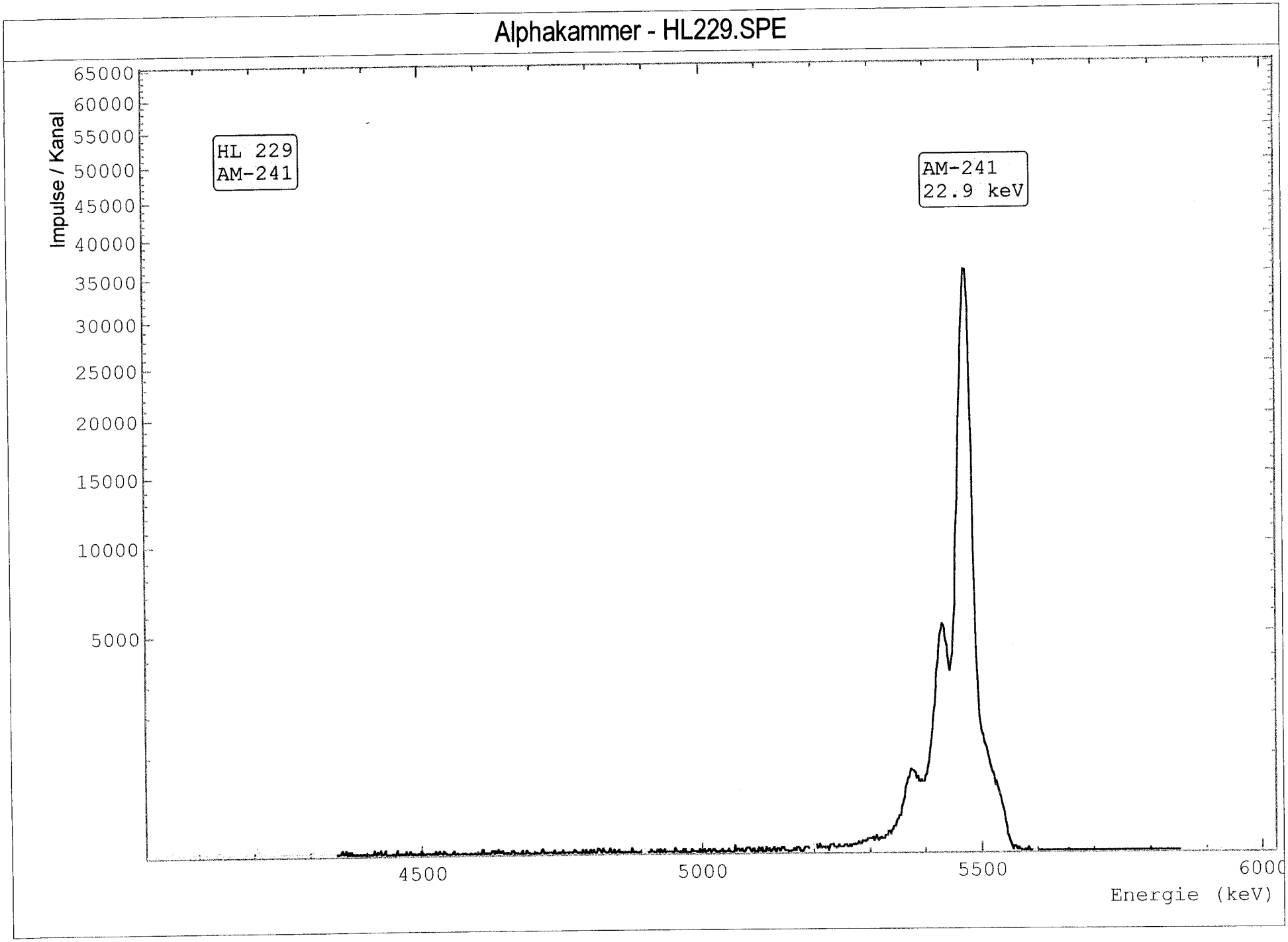
Additional Information

Remark ---

* see page 2 for explanation

AEA Technology QSA GmbH

i. A. [signature]
(Production Manager)


Alphakammer - HL229.SPE
HL 229
AM-241
AM-241
22.9 keV
Impulse / Kanal
65000
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
4500
5000
5500
6000
Energie (keV)