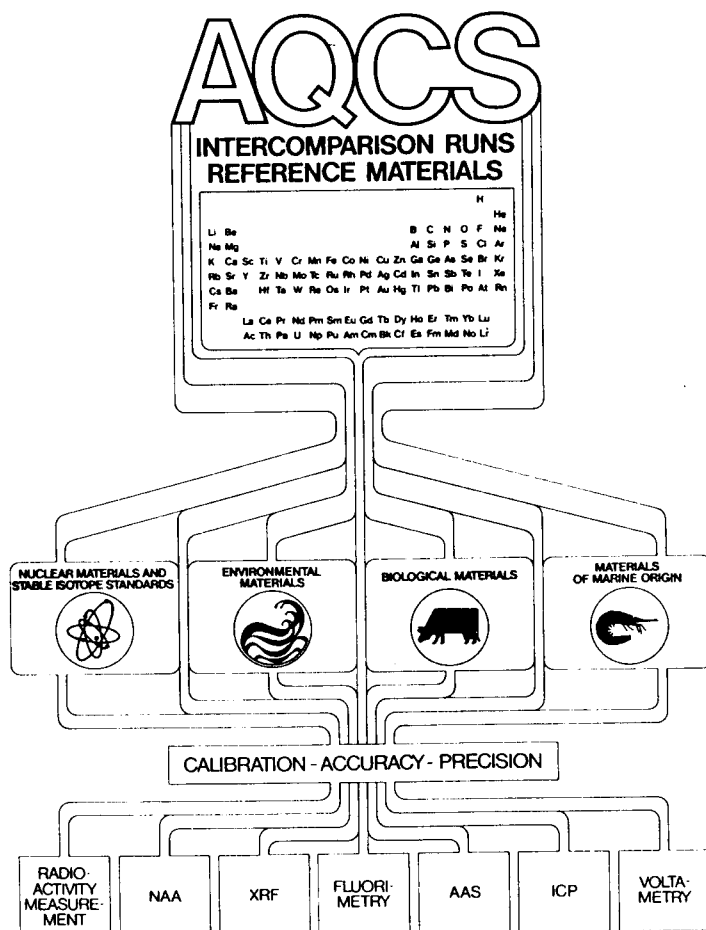


REFERENCE SHEET

IAEA-308

RADIONUCLIDES IN SEAWEED MIXTURE



ANALYTICAL QUALITY CONTROL SERVICES

INTERNATIONAL ATOMIC ENERGY AGENCY, P.O. BOX 100, A-1400 VIENNA, AUSTRIA





INTERNATIONAL ATOMIC ENERGY AGENCY
AGENCE INTERNATIONALE DE L'ENERGIE ATOMIQUE
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1989-10-01

REFERENCE SHEET

REFERENCE MATERIAL

IAEA-308 MIXTURE OF SEaweEDS

Reference date : 1 January 1988

Reference activity values :

Radionuclide	Recommended value ¹ Bq kg ⁻¹	Confidence interval ² Bq kg ⁻¹
Potassium-40	1381	1320-1456
Ruthenium-106	23	22-25
Silver-110m	2.0	1.2-2.7
Caesium-134	1.6	1.5-1.8
Caesium-137	5.6	5.3-6.0
Lead-210	73	66-75
Thorium-228	2.5	2.2-3.6
Plutonium-238	0.017	0.016-0.023
Plutonium-239+240	0.50	0.46-0.52
Americium-241	0.17	0.16-0.25

1. Activities are expressed on dry-weight basis (constant weight at 80°C).
2. The confidence intervals are given for the significance level of $\alpha=0.05$.
3. The ²⁴¹Am activity changes with time due to the decay of ²⁴¹Pu present in the sample.

Designation

This sample is intended as a reference material for the measurements of man-made and natural radionuclides in environmental marine samples. It can also be used for checking analytical techniques and for educational purposes.

Description of the material

The mixture of seaweeds was collected along the shore of the Principality of Monaco in October 1986. The material was roughly cleaned, dried in the open air, ground, sieved and homogenized; then it was dispensed into polyethylene bottles. Moisture content determined by drying aliquots of the material at 80°C to constant weight (1-2 days) was found to be 3.9%.

Homogeneity test

The homogeneity test was made on samples selected at random by measuring ^{40}K , ^{106}Ru , $^{110\text{m}}\text{Ag}$, ^{134}Cs , ^{137}Cs , $^{239+240}\text{Pu}$ and ^{241}Am . It was found that the results did not differ significantly and that the material could be considered as being homogeneous.

Establishing of reference values

The reference values given in the certificate were established on the basis of results submitted by 67 laboratories participating in the world-wide intercomparison exercise organized by the IAEA-ILMR during the period 1988-1989. They represent overall median values calculated from the results that have passed the statistical tests for outliers. The confidence intervals were calculated using statistical tables for distribution-free sample population and represent symmetrical two-sided intervals at a significance level of 0.05. A number of quality criteria were demanded in order for the values to be recommended.

More details concerning the intercomparison sample IAEA-308 can be found in the Report "Intercomparison of radionuclide measurements in mixed seaweeds sample IAEA-308", Report No.43, International Laboratory of Marine Radioactivity, IAEA, Monaco, December 1989. This report is available upon request.

Note : These reference values are the best estimates of the true activity concentrations available at present. They may undergo future revisions as new data become available. The users of this reference material are therefore kindly invited to report any meaningful results that may help improve any resulting re-evaluation.

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