EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

CERTIFIED REFERENCE MATERIAL
BCR® – 614
Solution S7

CERTIFICATE OF ANALYSIS

POLYCHLORODIBENZO-*P*-DIOXINS (PCDDs) AND POLYCHLORODIBENZOFURANS (PCDFs) IN N-NONANE		
Congener	Mass fraction	
	Certified value [1] [µg/kg]	Uncertainty [2] [µg/kg]
^{13}C-2,3,7,8-T_4CDD	139.5	0.6
^{13}C-1,2,3,7,8-P_5CDD	139	4
^{13}C-1,2,3,4,7,8-HCDD	139.8	0.7
^{13}C-1,2,3,6,7,8-HCDD	139.3	2.4
^{13}C-1,2,3,4,6,7,8-HCDD	279	6
^{13}C-1,2,3,4,6,7,8,9-O_8CDD	278.7	1.6
^{13}C-2,3,7,8-T_4CDF	139.5	0.9
^{13}C-2,3,4,7,8-P_5CDF	139.2	0.6
^{13}C-1,2,3,4,7,8-HCDF	138.9	0.6
^{13}C-1,2,3,6,7,8-HCDF	139.4	1.1
^{13}C-2,3,4,6,7,8-HCDF	139.4	0.8
^{13}C-1,2,3,4,6,7,8-HCDF	278.7	2.0
^{13}C-1,2,3,4,6,7,8,9-O_8CDF	278.7	2.5

1) The certified mass fraction has been calculated from the purity of the individual PCDD/F compounds as assessed in a comprehensive study and the gravimetric preparation of the solution. The value is traceable to the International System of Units (SI).

2) The certified uncertainties have been calculated by combining contributions from the purity study and the gravimetric preparation and are expanded uncertainties with a coverage factor k = 2, corresponding to a level of confidence of about 95 %.

This certificate is valid for one year after purchase.

Sales date:

The minimum sample intake is not critical. The sample can be considered as homogeneous.

NOTE

This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, November 2001
Revised: June 2007

Signed:

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Indicative Values		
Congener	Mass fraction expressed in concentration units [1)] [µg/L]	Uncertainty expressed in concentration units [1)] [µg/L]
^{13}C-2,3,7,8-T_4CDD	100.1	0.4
^{13}C-1,2,3,7,8-P_5CDD	99.9	2.4
^{13}C-1,2,3,4,7,8-HCDD	100.3	0.5
^{13}C-1,2,3,6,7,8-HCDD	100.0	1.7
^{13}C-1,2,3,4,6,7,8-HCDD	200	4
^{13}C-1,2,3,4,6,7,8,9-O_8CDD	200.0	1.1
^{13}C-2,3,7,8-T_4CDF	100.1	0.6
^{13}C-2,3,4,7,8-P_5CDF	99.9	0.4
^{13}C-1,2,3,4,7,8-HCDF	99.7	0.5
^{13}C-1,2,3,6,7,8-HCDF	100.0	0.8
^{13}C-2,3,4,6,7,8-HCDF	100.0	0.6
^{13}C-1,2,3,4,6,7,8-HCDF	200.0	1.4
^{13}C-1,2,3,4,6,7,8,9-O_8CDF	200.0	1.8

[1)] For the conversion to concentration units (µg/L) a density value for n-nonane at 20 °C of 0.7176 g/mL was used. It is stressed that these values are not certified.

DESCRIPTION OF THE SAMPLE

The solution of natural and labelled PCDD and PCDF congeners in n-nonane is presented in brown glass ampoules sealed under helium gas. The ampoule contains about 1 mL solution.

ANALYTICAL METHOD USED FOR CERTIFICATION

The identity of the individual congeners was assessed by ^{1}H-NMR, the purity of the crystals was verified by HRGC with FID, ECD and HRMS as final detection, HPLC with diode array detection and ICP-MS for inorganic impurities. The solutions were prepared in n-nonane of verified purity on calibrated analytical balances.

PARTICIPANTS

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- European Commission, Joint Research Centre, Institute for Reference Materials and Measurements, Geel (BE)
- University of Amsterdam, Amsterdam (NL)
- Vlaamse Instelling voor Technologisch Onderzoek, VITO, Mol (BE)

SAFETY INFORMATION

To avoid injury to persons or contamination of laboratories, the ampoule should be handled only by trained staff. National regulations regarding storage, use, disposal, and relocation of such materials may apply and should be strictly adhered to.

INSTRUCTIONS FOR USE

The solution BCR-614 S7 is intended as GC-HRMS calibration solution and is ready for use. Before attempting any sampling, the solution should be allowed to attain room temperature and should be re-homogenised thoroughly, e.g. by sonication. Before use, it is recommended to weigh each ampoule, to check for solvent evaporation losses, on a calibrated analytical balance and verify the mass indicated on the acrylic glass tube used for packing each individual ampoule.
Please note that an additional solution (BCR-614 S9) may be used to check the instrumental performance, particularly with regard to the chromatographic separation of the 2,3,7,8-Cl substituted congeners from potential interfering compounds. With the current technology, the separation of all analytes from interfering isomers in environmental samples requires the analysis to be performed on at least two capillary columns with different polarity. More details are given in the certification report of BCR-614 in the chapter on instructions for use.

Special laboratory safety precautions should be observed when opening the glass ampoule. Opening must be performed in a fume hood situated in a restricted access area, wearing the appropriate protective clothing and gloves. After opening the content should be transferred to a vial suitable for storage of standard solutions. Throughout the use it is recommended to check for solvent evaporation losses by controlling the mass of the vial each time before and after sampling.

STORAGE

Upon receipt the unopened containers should be stored at a maximum temperature of 4 ºC in the dark.
However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

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NOTE

A technical report on the production of BCR-614 Solution S7 is available on the internet (http://www.irmm.jrc.be). A paper copy can be obtained from IRMM on request.

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