



# CERTIFIED REFERENCE MATERIAL BCR<sup>®</sup> – 481

## CERTIFICATE OF ANALYSIS

INDUSTRIAL SOIL				
IUPAC Code		Mass fraction based on dry mass		Number of accepted sets of data p
		Certified value <sup>1)</sup> [mg/kg]	Uncertainty <sup>2)</sup> [mg/kg]	
PCB 101	2,2',4,5,5' Pentachlorobiphenyl	37	3	18
PCB 118	2,3',4,4',5 Pentachlorobiphenyl	9.4	0.7	15
PCB 128	2,2',3,3',4,4' Hexachlorobiphenyl	9.1	0.8	7
PCB 149	2,2',3,4',5,6 Hexachlorobiphenyl	97	7	11
PCB 153	2,2',4,4',5,5' Hexachlorobiphenyl	137	7	18
PCB 156	2,3,3',4,4',5 Hexachlorobiphenyl	7.0	0.5	14
PCB 170	2,2',3,3',4,4',5 Heptachlorobiphenyl	52	4	12
PCB 180	2,2',3,4,4',5,5' Heptachlorobiphenyl	124	6	17

1) Unweighted mean value of the means of p accepted sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The value is traceable to the International System of Units (SI).  
2) The uncertainty is taken as the half-width of the 95 % confidence interval of the mean given in <sup>1)</sup>.

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 200 mg.

### 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, December 1994

Revised: November 2007

Signed: 

Prof. Dr. Hendrik Emons  
Unit for Reference Materials  
EC-JRC-IRMM  
Retieseweg 111  
2440 Geel, Belgium

## DESCRIPTION OF THE SAMPLE

The sample consists of approximately 25 g of industrial soil in brown glass bottles with a polyethene insert. Additional information on the presence of chlorobiphenyls other than those tabulated is given in the report.

## ANALYTICAL METHOD USED FOR CERTIFICATION

Calibration was done with solutions of BCR-CRM's (291, 293-298) or from compounds of verified purity and stoichiometry (PCB 128, 149, 156 and 170). The samples were extracted with a mixture of hexane and acetone, pentane and dichloromethane, or by pentane, ethyl acetate or by CO<sub>2</sub> supercritical fluid extraction with methanol as modifier. Eventual clean-up was carried out by sulphuric acid and/or column chromatography (on alumina, silica or florisil) or high performance liquid chromatography. Capillary gas chromatography with electron capture detection or mass-spectrometry was performed using different injection systems, different columns including multidimensional GC and different temperature programmes.

## PARTICIPANTS

Agricultural Research Center, Jokionen ( F)I  
Bureau de Recherche Géologique et Minière (BRGM), Orléans (FR)  
CEC, Joint Research Centre, Environment Institute, Ispra (IT)  
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Vlaamse Instelling voor Technologisch Onderzoek (VITO), Mol (BE)

## SAFETY INFORMATION

The usual laboratory safety precautions apply.

## INSTRUCTIONS FOR USE

The material is intended for quality control purposes, verification or validation of an analytical procedure. The material is not intended for use as a calibrant.

The results of the certification measurements were corrected for the water content which was determined by heating of aliquot (about 1 g) of soil at 105 °C until constant mass. The water content ranged from 1.2 to 3 % (mass fraction).

## STORAGE

Storage should take place at 18 °C.

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<sup>®</sup>-481 is available on the internet (<http://www.irmm.jrc.be>). A paper copy can be obtained from IRMM on request.