

Environmental Analysis

Standard Materials and More



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Environmental Analysis

Environmental pollution and climate change are amongst the biggest global challenges of our time. So that we can combat these issues in the right locations, we need a precise analysis of the current situation and the measures to be taken to protect our planet. In doing so, the range and the degree of specialisation of the methods and techniques to be applied in particular are a significant challenge for modern laboratories.

Whether on a small scale for local projects, across regions or at international level – Carl ROTH has the right products for your environmental analysis applications, from sampling through to analysis.



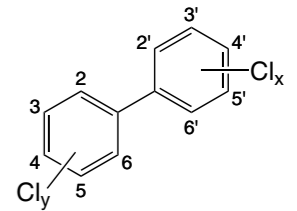
Standard Reference Substances

PCB Standards ROTI®Star

Polychlorinated biphenyls (PCBs) belong to the class of substances known as chlorinated hydrocarbons and are harmful substances with low biodegradability. Carl ROTH offers you various compounds (congeners) for your environmental analysis.

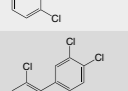
PCB neats are produced according to **ISO 17034** in an accredited environment. They come with certificates of analysis and an GC chromatogram.

PCB standards are available both as pure substance (neat) and as solution (in isooctane).



Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isooctane)	Art. No.	Pack Qty. (solution)
	PCB 1	2-PCB, 2-Chlorobiphenyl	1TPC.1	50 mg	100 µg/ml 500 µg/ml	1X0A.1 1X0C.1	1 ml
	PCB 2	3-PCB, 3-Chlorobiphenyl	1TP9.1 1TP9.2	10 mg 50 mg	100 µg/ml 500 µg/ml	1X0E.1 1X0H.1	1 ml
	PCB 3	4-PCB, 4-Chlorobiphenyl	1TP8.1	50 mg	100 µg/ml 500 µg/ml	1X0K.1 1X0L.1	1 ml
	PCB 4	2,2'-PCB, 2,2'-Dichlorobiphenyl	1TP7.1	25 mg	100 µg/ml 500 µg/ml	1X0N.1 1X0P.1	1 ml
	PCB 5	2,3-PCB, 2,3-Dichlorobiphenyl	1TPA.1	50 mg	100 µg/ml 500 µg/ml	1X0T.1 1X0X.1	1 ml
	PCB 6	2,3'-PCB, 2,3'-Dichlorobiphenyl	1TP6.1	10 mg	100 µg/ml 500 µg/ml	1X0Y.1 1X10.1	1 ml
	PCB 7	2,4-PCB, 2,4-Dichlorobiphenyl	1TP5.1	25 mg	100 µg/ml 500 µg/ml	1X11.1 1X12.1	1 ml
	PCB 8	2,4'-PCB, 2,4'-Dichlorobiphenyl	1TP4.1	25 mg	100 µg/ml 500 µg/ml	1X1T.1 1X1P.1	1 ml
	PCB 9	2,5-PCB, 2,5-Dichlorobiphenyl	1X02.1	50 mg	100 µg/ml 500 µg/ml	1X1N.1 1X1L.1	1 ml
	PCB 10	2,6-PCB, 2,6-Dichlorobiphenyl	1TP3.1	25 mg	100 µg/ml 500 µg/ml	1X1K.1 1X1H.1	1 ml
	PCB 11	3,3'-PCB, 3,3'-Dichlorobiphenyl	1X03.1	10 mg	100 µg/ml 500 µg/ml	1X1E.1 1X1C.1	1 ml
	PCB 12	3,4-PCB, 3,4-Dichlorobiphenyl	1TP2.1	50 mg	100 µg/ml 500 µg/ml	1X1A.1 1X19.1	1 ml
	PCB 13	3,4'-PCB, 3,4'-Dichlorobiphenyl	1X04.1	5 mg	100 µg/ml 500 µg/ml	1X18.1 1X17.1	1 ml
	PCB 14	3,5-PCB, 3,5-Dichlorobiphenyl	1TP0.1	50 mg	100 µg/ml 500 µg/ml	1X16.1 1X15.1	1 ml
	PCB 15	4,4'-PCB, 4,4'-Dichlorobiphenyl	1TNY.1	10 mg	100 µg/ml 500 µg/ml	1X14.1 1X13.1	1 ml
	PCB 16	2,2',3-PCB, 2,2',3-Trichlorobiphenyl	1TNX.1	10 mg	100 µg/ml 500 µg/ml	1X36.1 1X35.1	1 ml
	PCB 17	2,2',4-PCB, 2,2',4-Trichlorobiphenyl	1TP1.1	10 mg	100 µg/ml 500 µg/ml	1X34.1 1X33.1	1 ml
	PCB 18	2,2',5-PCB, 2,2',5-Trichlorobiphenyl	1TNT.1	25 mg	100 µg/ml 500 µg/ml	1X32.1 1X31.1	1 ml
	PCB 19	2,2',6-PCB, 2,2',6-Trichlorobiphenyl	1TNN.1	10 mg	100 µg/ml 500 µg/ml	1X30.1 1X2Y.1	1 ml

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 20	2,3,3'-PCB, 2,3,3'-Trichlorobiphenyl	1TNL.1	10 mg	100 µg/ml 500 µg/ml	1X2X.1 1X2T.1	1 ml
	PCB 21	2,3,4-PCB, 2,3,4-Trichlorobiphenyl	1TNK.1	10 mg	100 µg/ml 500 µg/ml	1X2P.1 1X2N.1	1 ml
	PCB 22	2,3,4'-PCB, 2,3,4'-Trichlorobiphenyl	1TNP.1	10 mg	100 µg/ml 500 µg/ml	1X2L.1 1X2K.1	1 ml
	PCB 23	2,3,5-PCB, 2,3,5-Trichlorobiphenyl	1TNH.1	10 mg	100 µg/ml 500 µg/ml	1X2H.1 1X2E.1	1 ml
	PCB 24	2,3,6-PCB, 2,3,6-Trichlorobiphenyl	1TNE.1	10 mg	100 µg/ml 500 µg/ml	1X2C.1 1X2A.1	1 ml
	PCB 25	2,3',4-PCB, 2,3',4-Trichlorobiphenyl	1TNC.1	10 mg	100 µg/ml 500 µg/ml	1X29.1 1X28.1	1 ml
	PCB 26	2,3',5-PCB, 2,3',5-Trichlorobiphenyl	1TNA.1	25 mg	100 µg/ml 500 µg/ml	1X27.1 1X26.1	1 ml
	PCB 27	2,3',6-PCB, 2,3',6-Trichlorobiphenyl	1TN9.1	10 mg	100 µg/ml 500 µg/ml	1X25.1 1X24.1	1 ml
	PCB 28	2,4,4'-PCB, 2,4,4'-Trichlorobiphenyl	1X05.1	10 mg	100 µg/ml 500 µg/ml	1X23.1 1X22.1	1 ml
	PCB 29	2,4,5-PCB, 2,4,5-Trichlorobiphenyl	1TN8.1	10 mg	100 µg/ml 500 µg/ml	1X21.1 1X20.1	1 ml
	PCB 30	2,4,6-PCB, 2,4,6-Trichlorobiphenyl	1TN7.1	25 mg	100 µg/ml 500 µg/ml	1X1Y.1 1X1X.1	1 ml
	PCB 31	2,4',5-PCB, 2,4',5-Trichlorobiphenyl	1TN6.1	25 mg	100 µg/ml 500 µg/ml	1X53.1 1X52.1	1 ml
	PCB 32	2,4',6-PCB, 2,4',6-Trichlorobiphenyl	1TN5.1	10 mg	100 µg/ml 500 µg/ml	1X51.1 1XP1.1	1 ml
	PCB 33	2,3',4'-PCB, 2,3',4'-Trichlorobiphenyl	1TN4.1	10 mg	100 µg/ml 500 µg/ml	1X50.1 1X4X.1	1 ml
	PCB 34	2',3,5-PCB, 2',3,5-Trichlorobiphenyl	1TN3.1	5 mg	100 µg/ml 500 µg/ml	1X4T.1 1X4P.1	1 ml
	PCB 35	3,3',4-PCB, 3,3',4-Trichlorobiphenyl	1TN2.1	5 mg	100 µg/ml 500 µg/ml	1X4Y.1 1X4N.1	1 ml
	PCB 36	3,3',5-PCB, 3,3',5-Trichlorobiphenyl	1TN1.1	10 mg	100 µg/ml 500 µg/ml	1X4K.1 1X4H.1	1 ml
	PCB 37	3,4,4'-PCB, 3,4,4'-Trichlorobiphenyl	1TN0.1	5 mg	100 µg/ml 500 µg/ml	1X4E.1 1X4L.1	1 ml
	PCB 38	3,4,5-PCB, 3,4,5-Trichlorobiphenyl	1TLY.1	10 mg	100 µg/ml 500 µg/ml	1X4C.1 1X49.1	1 ml
	PCB 39	3,4',5-PCB, 3,4',5-Trichlorobiphenyl	1TLX.1	10 mg	100 µg/ml 500 µg/ml	1X48.1 1X47.1	1 ml

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 40	2,2',3,3'-PCB, 2,2',3,3'-Tetrachlorobiphenyl	1TLT.1	25 mg	100 µg/ml 500 µg/ml	1X46.1 1X4A.1	1 ml
	PCB 41	2,2',3,4-PCB, 2,2',3,4-Tetrachlorobiphenyl	1TLP.1	5 mg	100 µg/ml 500 µg/ml	1X45.1 1X44.1	1 ml
	PCB 42	2,2',3,4'-PCB, 2,2',3,4'-Tetrachlorobiphenyl	1TLN.1	10 mg	100 µg/ml 500 µg/ml	1X43.1 1X42.1	1 ml
	PCB 43	2,2',3,5-PCB, 2,2',3,5-Tetrachlorobiphenyl	1TLL.1	10 mg	100 µg/ml 500 µg/ml	1X41.1 1X40.1	1 ml
	PCB 44	2,2',3,5'-PCB, 2,2',3,5'-Tetrachlorobiphenyl	1TLK.1	25 mg	100 µg/ml 500 µg/ml	1X3Y.1 1X3X.1	1 ml
	PCB 45	2,2',3,6-PCB, 2,2',3,6-Tetrachlorobiphenyl	1TLH.1	5 mg	100 µg/ml 500 µg/ml	1X3T.1 1X3P.1	1 ml
	PCB 46	2,2',3,6'-PCB, 2,2',3,6'-Tetrachlorobiphenyl	1TLE.1	5 mg	100 µg/ml 500 µg/ml	1X3N.1 1X3L.1	1 ml
	PCB 47	2,2',4,4'-PCB, 2,2',4,4'-Tetrachlorobiphenyl	1TLC.1	25 mg	100 µg/ml 500 µg/ml	1X3K.1 1X3H.1	1 ml
	PCB 48	2,2',4,5-PCB, 2,2',4,5-Tetrachlorobiphenyl	1TLA.1	5 mg	100 µg/ml 500 µg/ml	1X3E.1 1X3C.1	1 ml
	PCB 49	2,2',4,5'-PCB, 2,2',4,5'-Tetrachlorobiphenyl	1TL9.1	20 mg	100 µg/ml 500 µg/ml	1X3A.1 1X39.1	1 ml
	PCB 50	2,2',4,6-PCB, 2,2',4,6-Tetrachlorobiphenyl	1TL8.1	5 mg	100 µg/ml 500 µg/ml	1X38.1 1X37.1	1 ml
	PCB 51	2,2',4,6'-PCB, 2,2',4,6'-Tetrachlorobiphenyl	1TL7.1	10 mg	100 µg/ml 500 µg/ml	1X9E.1 1X9C.1	1 ml
	PCB 52	2,2',5,5'-PCB, 2,2',5,5'-Tetrachlorobiphenyl	1TL6.1	10 mg	100 µg/ml 500 µg/ml	1X9A.1 1X99.1	1 ml
	PCB 53	2,2',5,6'-PCB, 2,2',5,6'-Tetrachlorobiphenyl	1TL5.1	25 mg	100 µg/ml 500 µg/ml	1X9H.1 1XP4.1	1 ml
	PCB 55	2,3,3',4-PCB, 2,3,3',4-Tetrachlorobiphenyl	1TL4.1	10 mg	100 µg/ml 500 µg/ml	1X97.1 1X96.1	1 ml
	PCB 56	2,3,3',4'-PCB, 2,3,3',4'-Tetrachlorobiphenyl	1TL3.1	5 mg	100 µg/ml 500 µg/ml	1X95.1 1X94.1	1 ml
	PCB 57	2,3,3',5-PCB, 2,3,3',5-Tetrachlorobiphenyl	1TL2.1	5 mg	100 µg/ml 500 µg/ml	1X98.1 1X93.1	1 ml
	PCB 58	2,3,3',5'-PCB, 2,3,3',5'-Tetrachlorobiphenyl	1TL1.1	10 mg	100 µg/ml 500 µg/ml	1X91.1 1X90.1	1 ml
	PCB 59	2,3,3',6-PCB, 2,3,3',6-Tetrachlorobiphenyl	1TL0.1	10 mg	100 µg/ml 500 µg/ml	1X8Y.1 1X8X.1	1 ml
	PCB 60	2,3,4,4'-PCB, 2,3,4,4'-Tetrachlorobiphenyl	1TKY.1	10 mg	100 µg/ml 500 µg/ml	1X92.1 1X8T.1	1 ml
	PCB 61	2,3,4,5-PCB, 2,3,4,5-Tetrachlorobiphenyl	1TKX.1	10 mg	100 µg/ml 500 µg/ml	1X8N.1 1X8L.1	1 ml

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 62	2,3,4,6-PCB, 2,3,4,6-Tetrachlorobiphenyl	1TKT.1	5 mg	100 µg/ml 500 µg/ml	1X8K.1 1X8H.1	1 ml
	PCB 63	2,3,4,5-PCB, 2,3,4,5-Tetrachlorobiphenyl	1TKP.1	10 mg	100 µg/ml 500 µg/ml	1X8E.1 1X8P.1	1 ml
	PCB 64	2,3,4',6-PCB, 2,3,4',6-Tetrachlorobiphenyl	1TKN.1	10 mg	100 µg/ml 500 µg/ml	1XNP.1 1X8A.1	1 ml
	PCB 65	2,3,5,6-PCB, 2,3,5,6-Tetrachlorobiphenyl	1TKL.1	25 mg	100 µg/ml 500 µg/ml	1X89.1 1X88.1	1 ml
	PCB 66	2,3',4,4'-PCB, 2,3',4,4'-Tetrachlorobiphenyl	1TKK.1	20 mg	100 µg/ml 500 µg/ml	1X87.1 1X8C.1	1 ml
	PCB 67	2,3',4,5-PCB, 2,3',4,5-Tetrachlorobiphenyl	1TKH.1	10 mg	100 µg/ml 500 µg/ml	1X86.1 1X84.1	1 ml
	PCB 68	2,3',4,5'-PCB, 2,3',4,5'-Tetrachlorobiphenyl	1TKE.1	10 mg	100 µg/ml 500 µg/ml	1X83.1 1X82.1	1 ml
	PCB 69	2,3',4,6-PCB, 2,3',4,6-Tetrachlorobiphenyl	1TKC.1	10 mg	100 µg/ml 500 µg/ml	1X81.1 1X80.1	1 ml
	PCB 70	2,3',4',5-PCB, 2,3',4',5-Tetrachlorobiphenyl	1TKA.1	10 mg	100 µg/ml 500 µg/ml	1X85.1 1XNX.1	1 ml
	PCB 71	2,3',4',6-PCB, 2,3',4',6-Tetrachlorobiphenyl	1TK9.1	10 mg	100 µg/ml 500 µg/ml	1X7X.1 1X7T.1	1 ml
	PCB 72	2,3',5,5'-PCB, 2,3',5,5'-Tetrachlorobiphenyl	1TK8.1	10 mg	100 µg/ml 500 µg/ml	1X7P.1 1X7N.1	1 ml
	PCB 73	2,3',5',6-PCB, 2,3',5',6-Tetrachlorobiphenyl	1TK7.1	5 mg	100 µg/ml 500 µg/ml	1X7Y.1 1X7L.1	1 ml
	PCB 74	2,4,4',5-PCB, 2,4,4',5-Tetrachlorobiphenyl	1TK6.1	10 mg	100 µg/ml 500 µg/ml	1X7H.1 1X7E.1	1 ml
	PCB 75	2,4,4',6-PCB, 2,4,4',6-Tetrachlorobiphenyl	1TK5.1	5 mg	100 µg/ml 500 µg/ml	1X7C.1 1X7A.1	1 ml
	PCB 76	2,3',4',5'-PCB, 2,3',4',5'-Tetrachlorobiphenyl	1TK4.1	10 mg	100 µg/ml 500 µg/ml	1X7K.1 1X79.1	1 ml
	PCB 77	3,3',4,4'-PCB, 3,3',4,4'-Tetrachlorobiphenyl	1TK3.1	20 mg	100 µg/ml 500 µg/ml	1X77.1 1X76.1	1 ml
	PCB 78	3,3',4,5-PCB, 3,3',4,5-Tetrachlorobiphenyl	1TK2.1	10 mg	100 µg/ml 500 µg/ml	1X75.1 1X74.1	1 ml
	PCB 79	3,3',4,5'-PCB, 3,3',4,5'-Tetrachlorobiphenyl	1TK1.1	10 mg	100 µg/ml 500 µg/ml	1X78.1 1X73.1	1 ml

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 80	3,3',5,5'-PCB, 3,3',5,5'-Tetrachlorobiphenyl	1TK0.1	10 mg	100 µg/ml 500 µg/ml	1X71.1 1X70.1	1 ml
	PCB 81	3,4,4',5-PCB, 3,4,4',5-Tetrachlorobiphenyl	1THY.1	10 mg	100 µg/ml 500 µg/ml	1X6Y.1 1X6X.1	1 ml
	PCB 82	2,2',3,3',4-PCB, 2,2',3,3',4-Pentachlorobiphenyl	1THX.1	5 mg	100 µg/ml 500 µg/ml	1X6T.1 1X72.1	1 ml
	PCB 83	2,2',3,3',5-PCB, 2,2',3,3',5-Pentachlorobiphenyl	1THT.1	5 mg	100 µg/ml 500 µg/ml	1X6P.1 1X6N.1	1 ml
	PCB 84	2,2',3,3',6-PCB, 2,2',3,3',6-Pentachlorobiphenyl	1THP.1	10 mg	100 µg/ml 500 µg/ml	1X6L.1 1X6K.1	1 ml
	PCB 85	2,2',3,4,4'-PCB, 2,2',3,4,4'-Pentachlorobiphenyl	1THN.1	10 mg	100 µg/ml 500 µg/ml	1X6H.1 1XP5.1	1 ml
	PCB 86	2,2',3,4,5-PCB, 2,2',3,4,5-Pentachlorobiphenyl	1THL.1	10 mg	100 µg/ml 500 µg/ml	1X6E.1 1X6A.1	1 ml
	PCB 87	2,2',3,4,5'-PCB, 2,2',3,4,5'-Pentachlorobiphenyl	1THK.1	10 mg	100 µg/ml 500 µg/ml	1X69.1 1X68.1	1 ml
	PCB 88	2,2',3,4,6-PCB, 2,2',3,4,6-Pentachlorobiphenyl	1THH.1	5 mg	100 µg/ml 500 µg/ml	1X67.1 1X6C.1	1 ml
	PCB 89	2,2',3,4,6'-PCB, 2,2',3,4,6'-Pentachlorobiphenyl	1THE.1	5 mg	100 µg/ml 500 µg/ml	1X66.1 1XNN.1	1 ml
	PCB 90	2,2',3,4',5-PCB, 2,2',3,4',5-Pentachlorobiphenyl	1THC.1	10 mg	100 µg/ml 500 µg/ml	1X64.1 1X63.1	1 ml
	PCB 91	2,2',3,4',6-PCB, 2,2',3,4',6-Pentachlorobiphenyl	1THA.1	5 mg	100 µg/ml 500 µg/ml	1X62.1 1X65.1	1 ml
	PCB 92	2,2',3,5,5'-PCB, 2,2',3,5,5'-Pentachlorobiphenyl	1TH9.1	10 mg	100 µg/ml 500 µg/ml	1X61.1 1X5Y.1	1 ml
	PCB 93	2,2',3,5,6-PCB, 2,2',3,5,6-Pentachlorobiphenyl	1TH8.1	5 mg	100 µg/ml 500 µg/ml	1X5X.1 1X5T.1	1 ml
	PCB 94	2,2',3,5,6'-PCB, 2,2',3,5,6'-Pentachlorobiphenyl	1TH7.1	5 mg	100 µg/ml 500 µg/ml	1X60.1 1X5P.1	1 ml
	PCB 95	2,2',3,5',6-PCB, 2,2',3,5',6-Pentachlorobiphenyl	1TH6.1	5 mg	100 µg/ml 500 µg/ml	1X5L.1 1X5K.1	1 ml
	PCB 97	2,2',3,4',5'-PCB, 2,2',3,4',5'-Pentachlorobiphenyl	1TH5.1	10 mg	100 µg/ml 500 µg/ml	1X5H.1 1X5N.1	1 ml
	PCB 98	2,2',3,4',6-PCB, 2,2',3,4',6-Pentachlorobiphenyl	1TH4.1	5 mg	100 µg/ml 500 µg/ml	1X5E.1 1X5C.1	1 ml
	PCB 99	2,2',4,4',5-PCB, 2,2',4,4',5-Pentachlorobiphenyl	1TH3.1	5 mg	100 µg/ml 500 µg/ml	1X5A.1 1X59.1	1 ml
	PCB 100	2,2',4,4',6-PCB, 2,2',4,4',6-Pentachlorobiphenyl	1TH2.1	5 mg	100 µg/ml 500 µg/ml	1XP6.1 1X58.1	1 ml

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 101	2,2',4,5,5'-PCB, 2,2',4,5,5'-Pentachlorobiphenyl	1TH1.1	10 mg	100 µg/ml	1X56.1	1 ml
					500 µg/ml	1X55.1	
	PCB 102	2,2',4,5,6'-PCB, 2,2',4,5,6'-Pentachlorobiphenyl	1TH0.1	5 mg	100 µg/ml	1X54.1	1 ml
					500 µg/ml	1X57.1	
	PCB 103	2,2',4,5,6-PCB, 2,2',4,5,6-Pentachlorobiphenyl	1TEY.1	10 mg	100 µg/ml	1XK1.1	1 ml
					500 µg/ml	1XK0.1	
	PCB 105	2,3,3',4,4'-PCB, 2,3,3',4,4'-Pentachlorobiphenyl	1X00.1	5 mg	100 µg/ml	1XH1.1	1 ml
					500 µg/ml	1XP3.1	
	PCB 106	2,3,3',4,5-PCB, 2,3,3',4,5-Pentachlorobiphenyl	1X01.1	5 mg	100 µg/ml	1XHX.1	1 ml
					500 µg/ml	1XP0.1	
	PCB 107	2,3,3',4,5-PCB, 2,3,3',4,5-Pentachlorobiphenyl	1TY1.1	10 mg	100 µg/ml	1XHP.1	1 ml
					500 µg/ml	1XHN.1	
	PCB 108	2,3,3',4,5'-PCB, 2,3,3',4,5'-Pentachlorobiphenyl	1TYT.1	5 mg	100 µg/ml	1XHL.1	1 ml
					500 µg/ml	1XHT.1	
	PCB 109	2,3,3',4,6-PCB, 2,3,3',4,6-Pentachlorobiphenyl	1TYP.1	5 mg	100 µg/ml	1XHK.1	1 ml
					500 µg/ml	1XHH.1	
	PCB 110	2,3,3',4,6-PCB, 2,3,3',4,6-Pentachlorobiphenyl	1TYN.1	5 mg	100 µg/ml	1XHE.1	1 ml
					500 µg/ml	1XHC.1	
	PCB 111	2,3,3',5,5'-PCB, 2,3,3',5,5'-Pentachlorobiphenyl	1TYX.1	10 mg	100 µg/ml	1XHA.1	1 ml
					500 µg/ml	1XH9.1	
	PCB 112	2,3,3',5,6-PCB, 2,3,3',5,6-Pentachlorobiphenyl	1TYL.1	5 mg	100 µg/ml	1XH8.1	1 ml
					500 µg/ml	1XH7.1	
	PCB 113	2,3,3',5,6-PCB, 2,3,3',5,6-Pentachlorobiphenyl	1TYK.1	10 mg	100 µg/ml	1XH6.1	1 ml
					500 µg/ml	1XH5.1	
	PCB 114	2,3,4,5,4'-PCB, 2,3,4,5,4'-Pentachlorobiphenyl	1TYH.1	5 mg	100 µg/ml	1XH4.1	1 ml
					500 µg/ml	1XH3.1	
	PCB 115	2,3,4,4',6-PCB, 2,3,4,4',6-Pentachlorobiphenyl	1TYE.1	5 mg	100 µg/ml	1XH2.1	1 ml
					500 µg/ml	1XH1.1	
	PCB 116	2,3,4,5,6-PCB, 2,3,4,5,6-Pentachlorobiphenyl	1TYC.1	10 mg	100 µg/ml	1XP8.1	1 ml
					500 µg/ml	1XEY.1	
	PCB 117	2,3,4',5,6-PCB, 2,3,4',5,6-Pentachlorobiphenyl	1X06.1	5 mg	100 µg/ml	1XH0.1	1 ml
					500 µg/ml	1XEX.1	
	PCB 118	2,3',4,4',5-PCB, 2,3',4,4',5-Pentachlorobiphenyl	1TYA.1	10 mg	100 µg/ml	1XEP.1	1 ml
					500 µg/ml	1XEN.1	
	PCB 119	2,3',4,4',6-PCB, 2,3',4,4',6-Pentachlorobiphenyl	1TY8.1	10 mg	100 µg/ml	1XEL.1	1 ml
					500 µg/ml	1XET.1	

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 120	2,3',4,5,5'-PCB, 2,3',4,5,5'-Pentachlorobiphenyl	1TY7.1	10 mg	100 µg/ml	1XEK.1	1 ml
					500 µg/ml	1XEH.1	
	PCB 121	2,3',4,5,6-PCB, 2,3',4,5,6-Pentachlorobiphenyl	1TY6.1	5 mg	100 µg/ml	1XEE.1	1 ml
					500 µg/ml	1XEC.1	
	PCB 122	2,3,3',4',5'-PCB, 2,3,3',4',5'-Pentachlorobiphenyl	1TY9.1	5 mg	100 µg/ml	1XEA.1	1 ml
					500 µg/ml	1XNT.1	
	PCB 123	2,3',4,4',5'-PCB, 2,3',4,4',5'-Pentachlorobiphenyl	1TY5.1	5 mg	100 µg/ml	1XE9.1	1 ml
					500 µg/ml	1XE7.1	
	PCB 124	2,3',4',5,5'-PCB, 2,3',4',5,5'-Pentachlorobiphenyl	1TY3.1	5 mg	100 µg/ml	1XE6.1	1 ml
					500 µg/ml	1XE5.1	
	PCB 125	2,3',4',5,6-PCB, 2,3',4',5,6-Pentachlorobiphenyl	1TY2.1	5 mg	100 µg/ml	1XE4.1	1 ml
					500 µg/ml	1XE8.1	
	PCB 126	3,3',4,4',5-PCB, 3,3',4,4',5-Pentachlorobiphenyl	1TY1.1	10 mg	100 µg/ml	1XE3.1	1 ml
					500 µg/ml	1XE1.1	
	PCB 127	3,3',4,5,5'-PCB, 3,3',4,5,5'-Pentachlorobiphenyl	1TY0.1	5 mg	100 µg/ml	1XE0.1	1 ml
					500 µg/ml	1XCY.1	
	PCB 128	2,3,4,2',3',4'-PCB, 2,3,4,2',3',4'-Hexachlorobiphenyl	1TY4.1	25 mg	100 µg/ml	1XCX.1	1 ml
					500 µg/ml	1XE2.1	
	PCB 129	2,2',3,3',4,5-PCB, 2,2',3,3',4,5-Hexachlorobiphenyl	1X07.1	5 mg	100 µg/ml	1XCT.1	1 ml
					500 µg/ml	1XCN.1	
	PCB 130	2,2',3,3',4,5'-PCB, 2,2',3,3',4,5'-Hexachlorobiphenyl	1TX1.1	5 mg	100 µg/ml	1XCL.1	1 ml
					500 µg/ml	1XCK.1	
	PCB 131	2,2',3,3',4,6-PCB, 2,2',3,3',4,6-Hexachlorobiphenyl	1TX1.1	5 mg	100 µg/ml	1XCH.1	1 ml
					500 µg/ml	1XCP.1	
	PCB 132	2,2',3,3',4,6'-PCB, 2,2',3,3',4,6'-Hexachlorobiphenyl	1TXP.1	5 mg	100 µg/ml	1XCE.1	1 ml
					500 µg/ml	1XCA.1	
	PCB 133	2,2',3,3',5,5'-PCB, 2,2',3,3',5,5'-Hexachlorobiphenyl	1TX1.1	5 mg	100 µg/ml	1XC9.1	1 ml
					500 µg/ml	1XC8.1	
	PCB 134	2,2',3,3',5,6-PCB, 2,2',3,3',5,6-Hexachlorobiphenyl	1TXN.1	5 mg	100 µg/ml	1XC7.1	1 ml
					500 µg/ml	1XCC.1	
	PCB 135	2,2',3,3',5,6'-PCB, 2,2',3,3',5,6'-Hexachlorobiphenyl	1TXK.1	5 mg	100 µg/ml	1XC6.1	1 ml
					500 µg/ml	1XC4.1	
	PCB 136	2,2',3,3',6,6'-PCB, 2,2',3,3',6,6'-Hexachlorobiphenyl	1TXH.1	20 mg	100 µg/ml	1XC3.1	1 ml
					500 µg/ml	1XC2.1	

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isooctane)	Art. No.	Pack Qty. (solution)
	PCB 137	2,2',3,4,4',5'-PCB, 2,2',3,4,4',5'-Hexachlorobiphenyl	1TXE.1	5 mg	100 µg/ml	1XC1.1	1 ml
					500 µg/ml	1XC5.1	
	PCB 138	2,2',3,4,4',5'-PCB, 2,2',3,4,4',5'-Hexachlorobiphenyl	1TXC.1	10 mg	100 µg/ml	1XC0.1	1 ml
					500 µg/ml	1XAX.1	
	PCB 140	2,2',3,4,4',6'-PCB, 2,2',3,4,4',6'-Hexachlorobiphenyl	1TXL.1	5 mg	100 µg/ml	1XAT.1	1 ml
					500 µg/ml	1XAP.1	
	PCB 141	2,2',3,4,5,5'-PCB, 2,2',3,4,5,5'-Hexachlorobiphenyl	1TXA.1	5 mg	100 µg/ml	1XAN.1	1 ml
					500 µg/ml	1XAY.1	
	PCB 142	2,2',3,4,5,6-PCB, 2,2',3,4,5,6-Hexachlorobiphenyl	1TX8.1	5 mg	100 µg/ml	1XAL.1	1 ml
					500 µg/ml	1XAK.1	
	PCB 144	2,2',3,4,5',6-PCB, 2,2',3,4,5',6-Hexachlorobiphenyl	1TX7.1	5 mg	100 µg/ml	1XAH.1	1 ml
					500 µg/ml	1XAE.1	
	PCB 146	2,2',3,4',5,5'-PCB, 2,2',3,4',5,5'-Hexachlorobiphenyl	1TX6.1	5 mg	100 µg/ml	1XAC.1	1 ml
					500 µg/ml	1XNL.1	
	PCB 147	2,2',3,4',5,6-PCB, 2,2',3,4',5,6-Hexachlorobiphenyl	1TX5.1	5 mg	100 µg/ml	1XAA.1	1 ml
					500 µg/ml	1XA8.1	
	PCB 148	2,2',3,4',5,6'-PCB, 2,2',3,4',5,6'-Hexachlorobiphenyl	1TX9.1	5 mg	100 µg/ml	1XA7.1	1 ml
					500 µg/ml	1XA6.1	
	PCB 149	2,2',3,4',5',6-PCB, 2,2',3,4',5',6-Hexachlorobiphenyl	1X08.1	5 mg	100 µg/ml	1XA5.1	1 ml
					500 µg/ml	1XA9.1	
	PCB 151	2,2',3,5,5',6'-PCB, 2,2',3,5,5',6'-Hexachlorobiphenyl	1TX3.1	5 mg	100 µg/ml	1XA4.1	1 ml
					500 µg/ml	1XA2.1	
	PCB 153	2,2',4,4',5,5'-PCB, 2,2',4,4',5,5'-Hexachlorobiphenyl	1TX2.1	10 mg	100 µg/ml	1XA1.1	1 ml
					500 µg/ml	1XA0.1	
	PCB 154	2,2',4,4',5',6-PCB, 2,2',4,4',5',6-Hexachlorobiphenyl	1TX1.1	5 mg	100 µg/ml	1X9Y.1	1 ml
					500 µg/ml	1XA3.1	
	PCB 155	2,2',4,4',6,6'-PCB, 2,2',4,4',6,6'-Hexachlorobiphenyl	1TX4.1	10 mg	100 µg/ml	1X9X.1	1 ml
					500 µg/ml	1X9T.1	
	PCB 156	2,3,3',4,4',5-PCB, 2,3,3',4,4',5-Hexachlorobiphenyl	1TX0.1	10 mg	100 µg/ml	1X9P.1	1 ml
					500 µg/ml	1X9N.1	
	PCB 157	2,3,3',4,4',5'-PCB, 2,3,3',4,4',5'-Hexachlorobiphenyl	1TTY.1	10 mg	100 µg/ml	1X9L.1	1 ml
					500 µg/ml	1X9K.1	
	PCB 158	2,3,3',4,4',6-PCB, 2,3,3',4,4',6-Hexachlorobiphenyl	1TTX.1	10 mg	100 µg/ml	1XNK.1	1 ml
					500 µg/ml	1XP2.1	
	PCB 159	2,3,3',4,5,5'-PCB, 2,3,3',4,5,5'-Hexachlorobiphenyl	1TTT.1	5 mg	100 µg/ml	1XNH.1	1 ml
					500 µg/ml	1XNE.1	
	PCB 160	2,3,3',4,5,6-PCB, 2,3,3',4,5,6-Hexachlorobiphenyl	1TTP.1	10 mg	100 µg/ml	1XNC.1	1 ml
					500 µg/ml	1XNA.1	

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isooctane)	Art. No.	Pack Qty. (solution)
	PCB 161	2,3,3',4,5',6-PCB, 2,3,3',4,5',6-Hexachlorobiphenyl	1TTN.1	5 mg	100 µg/ml	1XN9.1	1 ml
					500 µg/ml	1XN8.1	
	PCB 162	2,3,3',4',5,5'-PCB, 2,3,3',4',5,5'-Hexachlorobiphenyl	1TTL.1	10 mg	100 µg/ml	1XN7.1	1 ml
					500 µg/ml	1XN6.1	
	PCB 163	2,3,3',4',5,6-PCB, 2,3,3',4',5,6-Hexachlorobiphenyl	1TTK.1	10 mg	100 µg/ml	1XN5.1	1 ml
					500 µg/ml	1XN4.1	
	PCB 164	2,3,3',4',5',6-PCB, 2,3,3',4',5',6-Hexachlorobiphenyl	1TTH.1	5 mg	100 µg/ml	1XN3.1	1 ml
					500 µg/ml	1XN2.1	
	PCB 165	2,3,3',5,5',6-PCB, 2,3,3',5,5',6-Hexachlorobiphenyl	1TTE.1	5 mg	100 µg/ml	1XN1.1	1 ml
					500 µg/ml	1XN0.1	
	PCB 166	2,3,4,4',5,6-PCB, 2,3,4,4',5,6-Hexachlorobiphenyl	1TTC.1	5 mg	100 µg/ml	1XLY.1	1 ml
					500 µg/ml	1XLX.1	
	PCB 167	2,3',4,4',5,5'-PCB, 2,3',4,4',5,5'-Hexachlorobiphenyl	1TTA.1	10 mg	100 µg/ml	1XLT.1	1 ml
					500 µg/ml	1XLP.1	
	PCB 168	2,3',4,4',5',6-PCB, 2,3',4,4',5',6-Hexachlorobiphenyl	1TT9.1	5 mg	100 µg/ml	1XLN.1	1 ml
					500 µg/ml	1XLL.1	
	PCB 169	3,4,5,3',4',5'-PCB, 3,4,5,3',4',5'-Hexachlorobiphenyl	1TT8.1	5 mg	100 µg/ml	1XLK.1	1 ml
					500 µg/ml	1XLH.1	
	PCB 170	2,2',3,3',4,4',5-PCB, 2,2',3,3',4,4',5-Heptachlorobiphenyl	1TT7.1	5 mg	100 µg/ml	1XLE.1	1 ml
					500 µg/ml	1XLC.1	
	PCB 171	2,2',3,3',4,4',6-PCB, 2,2',3,3',4,4',6-Heptachlorobiphenyl	1TT6.1	5 mg	100 µg/ml	1XLA.1	1 ml
					500 µg/ml	1XL9.1	
	PCB 173	2,2',3,3',4,5,6-PCB, 2,2',3,3',4,5,6-Heptachlorobiphenyl	1TT5.1	5 mg	100 µg/ml	1XL8.1	1 ml
					500 µg/ml	1XL7.1	
	PCB 175	2,2',3,3',4,5',6-PCB, 2,2',3,3',4,5',6-Heptachlorobiphenyl	1TT4.1	5 mg	100 µg/ml	1XL6.1	1 ml
					500 µg/ml	1XL5.1	
	PCB 177	2,2',3,3',4,5',6'-PCB, 2,2',3,3',4,5',6'-Heptachlorobiphenyl	1TT3.1	5 mg	100 µg/ml	1XP7.1	1 ml
					500 µg/ml	1XL4.1	
	PCB 180	2,2',3,4,4',5,5'-PCB, 2,2',3,4,4',5,5'-Heptachlorobiphenyl	1TT2.1	5 mg	100 µg/ml	1XL3.1	1 ml
					500 µg/ml	1XL2.1	
	PCB 181	2,2',3,4,4',5,6-PCB, 2,2',3,4,4',5,6-Heptachlorobiphenyl	1TT1.1	5 mg	100 µg/ml	1XL1.1	1 ml
					500 µg/ml	1XL0.1	

Standard Reference Substances

Structural formula	Product	Synonym	Art. No.	Pack Qty. (neat)	Conc. (in isoctane)	Art. No.	Pack Qty. (solution)
	PCB 185	2,2',3,4,5,5',6-PCB, 2,2',3,4,5,5',6-Heptachlorobiphenyl	1TT0.1	5 mg	100 µg/ml	1XKY.1	1 ml
					500 µg/ml	1XNY.1	
	PCB 189	2,3,3',4,4',5,5'-PCB, 2,3,3',4,4',5,5'-Heptachlorobiphenyl	1TPY.1	5 mg	100 µg/ml	1XKX.1	1 ml
					500 µg/ml	1XKP.1	
	PCB 190	2,3,3',4,4',5,6-PCB, 2,3,3',4,4',5,6-Heptachlorobiphenyl	1TPX.1	5 mg	100 µg/ml	1XKN.1	1 ml
					500 µg/ml	1XKL.1	
	PCB 191	2,3,3',4,4',5,6-PCB, 2,3,3',4,4',5,6-Heptachlorobiphenyl	1TPT.1	5 mg	100 µg/ml	1XKK.1	1 ml
					500 µg/ml	1XKT.1	
	PCB 192	2,3,3',4,5,5',6-PCB, 2,3,3',4,5,5',6-Heptachlorobiphenyl	1TPP.1	5 mg	100 µg/ml	1XKH.1	1 ml
					500 µg/ml	1XKC.1	
	PCB 193	2,3,3',4,5,5',6-PCB, 2,3,3',4,5,5',6-Heptachlorobiphenyl	1TPN.1	5 mg	100 µg/ml	1XKA.1	1 ml
					500 µg/ml	1XK9.1	
	PCB 194	2,2',3,3',4,4',5,5'-PCB, 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	1TPL.1	5 mg	100 µg/ml	1XKE.1	1 ml
					500 µg/ml	1XK8.1	
	PCB 195	2,2',3,3',4,4',5,6-PCB, 2,2',3,3',4,4',5,6-Octachlorobiphenyl	1TPK.1	5 mg	100 µg/ml	1XK6.1	1 ml
					500 µg/ml	1XK5.1	
	PCB 197	2,2',3,3',4,4',6,6'-PCB, 2,2',3,3',4,4',6,6'-Octachlorobiphenyl	1TPH.1	5 mg	100 µg/ml	1XK4.1	1 ml
					500 µg/ml	1XK3.1	
	PCB 205	2,3,3',4,4',5,5',6-PCB, 2,3,3',4,4',5,5',6-Octachlorobiphenyl	1TPE.1	5 mg	100 µg/ml	1XK7.1	1 ml
					500 µg/ml	1XK2.1	

For safety information and additional data, see our current catalogue or at www.carlroth.com



Standard Reference Substances

PCB Mix Solutions

ROTI®Star

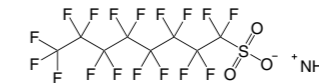
Carl ROTH also offers ready-to-use PCB mixtures for many applications, e.g. for PCB determination according to AltöIV, TrinkwV (BRD) and Regulation (EC) No. 1881/2006 for food.

Polychlorinated biphenyls

Purity	Composition	Art. No.	Pack Qty.
6 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 52, PCB 101, PCB 138, PCB 153, PCB 180	1YXP.1	1 ml
		1YXP.2	10 ml
7 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 52, PCB 101, PCB 138, PCB 153, PCB 180, PCB 209	1YXT.1	1 ml
		1YXX.1	1 ml
		1YXX.2	10 ml
7 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180	1YXY.1	1 ml
		1YXY.2	10 ml
8 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 31, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180	1YY0.1	1 ml
8 PCBs in cyclohexanectane – 10 µg/ml	PCB 28, PCB 31, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180	1YY0.1	1 ml
8 PCBs in <i>n</i> -hexane – 100 µg/ml	PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180, PCB 194	1YY2.1	1 ml
8 PCBs in <i>n</i> -hexane – 1 µg/ml	PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180, PCB 194	1YY1.1	5 ml
12 PCBs in isoctane – 10 µg/ml	PCB 77, PCB 81, PCB 105, PCB 114, PCB 118, PCB 123, PCB 126, PCB 156, PCB 157, PCB 167, PCB 169, PCB 189	1YY3.1	1 ml
14 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 31, PCB 52, PCB 77, PCB 101, PCB 105, PCB 118, PCB 126, PCB 128, PCB 138, PCB 153, PCB 156, PCB 169, PCB 170	1YY4.1	1 ml
18 PCBs in isoctane – 10 µg/ml	PCB 28, PCB 52, PCB 95, PCB 99, PCB 101, PCB 105, PCB 110, PCB 118, PCB 138, PCB 146, PCB 149, PCB 151, PCB 153, PCB 170, PCB 177, PCB 180, PCB 183, PCB 187	1YY5.1	1 ml
32 PCBs in isoctane – 10 µg/ml	PCB 18, PCB 28, PCB 31, PCB 44, PCB 52, PCB 77, PCB 81, PCB 95, PCB 99, PCB 101, PCB 105, PCB 110, PCB 114, PCB 118, PCB 123, PCB 126, PCB 128, PCB 138, PCB 146, PCB 149, PCB 151, PCB 153, PCB 156, PCB 157, PCB 167, PCB 169, PCB 170, PCB 177, PCB 180, PCB 183, PCB 187, PCB 189	1YY6.1	1 ml

For safety information and additional data, see our current catalogue or at www.carlroth.com

PFAS-Standards



ROTI®Star

Per- and polyfluorinated alkyl substances (PFAS) are molecules whose alkyl chains contain a great amount of fluorine substituents, making them water- and grease-repellent. These substances cannot be dissolved in aqueous or organic solvents and do not degrade in nature, which can be considered their ecological weak point. They are also often referred to as eternal chemicals. Science and chemical analysis are now facing great challenges.

Carl ROTH intends to play its part in tackling these challenges by providing a range of high-quality reference standards of common perfluorinated and polyfluorinated alkyl substances for your analytical laboratory.

Per- and Polyfluorinated Alkyl Compounds

Product name	Art. No.	Pack Qty.
Ammonium heptadecafluoro-1-octanesulfonate	20NL.1	10 mg
Decafluorotriphenylphosphine	20T7.1	10 mg
7H-Dodecafluoroheptanoic Acid	20NN.1	100 mg
<i>N</i> -Ethyl- <i>N</i> -(2-hydroxyethyl)perfluorooctylsulphonamide	20NP.1	100 mg
Heptadecafluorooctanesulfonic acid tetraethylammonium salt	20PN.1	100 mg
Pentadecafluorooctanoic acid ammonium salt	20T8.1	100 mg
1H,1H,2H,2H-Perfluoro-1-decanol	20NT.1	100 mg
2-(Perfluorohexyl)ethane-1-sulfonic Acid	20PK.1	10 mg
2-(Perfluorodecyl)ethanol	20NX.1	100 mg
Perfluoro(3,7-dimethyloctanoic acid)	20NY.1	100 mg
(Perfluorohexyl)ethyl Acrylate	20P0.1	100 mg
Perfluorooctane sulfonic acid	20TA.1	100 mg
Perfluorooctanesulphonamide	20T9.1	100 mg
Perfluorooctanoic acid sodium salt	20P2.1	100 mg
1H,1H,2H,2H-Perfluoro-1-octanol	20P1.1	100 mg
(Perfluorooctyl)ethyl Acrylate	20P3.1	100 mg
Perfluorotetradecanoic acid	20TC.1	100 mg
Perfluorotridecanoic acid	20PH.1	100 mg
2H,2H,3H,3H-Perfluoroundecanoic acid	20PP.1	50 mg
Perfluoroundecanoic acid	20TE.1	100 mg
2H,2H,3H,3H-Perfluoroundecanoic acid	20PL.1	100 mg
Tricosafuorododecanoic acid	20TH.1	100 mg

For safety information and additional data, see our current catalogue or at www.carlroth.com



Standard Reference Substances

Pesticides

ROTICHROM® Pestilyse®

Pesticides are chemical or biological substances used specifically to prevent, repel or eliminate pests such as insects, rodents, weeds, bacteria, molluscs, nematodes, moulds, fungi and pathogens affecting plants as well as all microbes. Residues of these substances will get into the air, the soil or the water and thus can also get into our food. Carl ROTH offers a wide range of pesticides as standard reference substances for testing the quality of soil, water and other samples in accordance with national and international regulations.

Pesticide Standards

Product name	Art. No.	Pack Qty.
Acephate	21HC.1	100 mg
Diethyltoluamide (DEET)	22TT.1	1 ml
Bromacil	22N9.1	10 mg
Carfentrazone-ethyl	22NT.1	10 mg
Chloridazon-desphenyl	22P0.1	10 mg
Clopyralid methyl ester	22PA.1	10 mg
Cyantraniliprole	22PK.1	10 mg
Cyproconazole	22T1.1	10 mg
Cythioate	22T4.1	10 mg
Dieldrin	22TN.1	10 mg
Endrin aldehyde	22X9.1	10 mg
Endrin ketone	22XA.1	10 mg
Etoxazole	22XP.1	10 mg
Fensulfotion-sulfone	22Y1.1	10 mg
Heptachlor-exo-epoxide	22YH.1	10 mg
Isopyrazam	230E.1	10 mg
Leptophos	230P.1	10 mg
Monocrotophos	232A.1	10 mg
Parathion	233C.1	10 mg
cis-Permethrine	233K.1	10 mg
Prallethrin	233Y.1	10 mg
Pyrimidifen	234Y.1	10 mg
Tetraconazole	236E.1	10 mg
Flonicamid	22Y5.1	25 mg
Sulfotep	235X.1	25 mg
Fosthiazate	22YC.1	30 mg
Bifenazate	22N7.1	50 mg
Coumachlor	22PH.1	50 mg
Cyhalofop-butyl	22PP.1	50 mg
Dazomet	22T6.1	50 mg
2,4'-DDE	22T7.1	50 mg
Dinotefuran	22X3.1	50 mg
Etoxazole	22XP.2	50 mg
Methiocarb-sulfone	231H.1	50 mg
Omethoate	232P.1	50 mg
Propineb	234K.1	50 mg
Quinoclamine	235C.1	50 mg
Tetradifon	236K.1	50 mg
Tetraethyl thionopyrophosphate (O,S-TEPP)	236L.1	50 mg
Triflumizole	237Y.1	50 mg
Uniconazole	238A.1	50 mg
Warfarin	238E.1	50 mg
Acetochlor	22LY.1	100 mg
N-Allylthiourea	22N0.1	100 mg
trans-4-(Aminomethyl)-cyclohexanecarboxylic acid (AMCA, TXA)	22N1.1	100 mg
Aroclor 5460	22N3.1	100 mg
Azoxystrobin	22N4.1	100 mg
Benomyl	22N5.1	100 mg
Bifonazole	22N8.1	100 mg
(4-Bromophenyl)urea	22NA.1	100 mg
Carbamazepin	22NE.1	100 mg
Carbamide	22NH.1	100 mg

Product name	Art. No.	Pack Qty.
Carbazole	22NL.1	100 mg
Carbofuran	22NP.1	100 mg
Chlorfenapyr	22NX.1	100 mg
Chlorimuron-ethyl	22P1.1	100 mg
Chlorpropham	22P4.1	100 mg
Chlorpyrifos	22P5.1	100 mg
Chlorothalonil	22P6.1	100 mg
Climbazole	22P7.1	100 mg
Clodinafop-propargyl ester	22P8.1	100 mg
Clomazone	22P9.1	100 mg
Clothianidin	22PC.1	100 mg
Clotrimazole	22PE.1	100 mg
Cyazofamid	22PL.1	100 mg
Cyflumetofen	22PN.1	100 mg
Cyhalothrin	22PT.1	100 mg
Cymoxanil	22PY.1	100 mg
Cypermethrin	22T0.1	100 mg
Cyprodinil	22T2.1	100 mg
Daminozide	22T5.1	100 mg
Deltamethrin	22T8.1	100 mg
Diazinon	22T9.1	100 mg
Dichlormid	22TH.1	100 mg
Diclofenac sodium	22TL.1	100 mg
Diethofencarb	22TP.1	100 mg
Diffufenican	22TY.1	100 mg
Dimethoate	22X0.1	100 mg
Dimethomorph	22X1.1	100 mg
N-(2,4-Dimethylphenyl)formamide	22X2.1	100 mg
Econazole	22X6.1	100 mg
Emamectin benzoate	22X7.1	100 mg
Endrin	22X8.1	100 mg
Epoxiconazole	22XC.1	100 mg
Ethephon	22XE.1	100 mg
Ethoprophos	22XH.1	100 mg
N-Ethylurea	22XK.1	100 mg
Etofenprox	22XN.1	100 mg
Famoxadone	22XT.1	100 mg
Fenhexamid	22XY.1	100 mg
Fenpyroximate	22Y0.1	100 mg
Fenthion	22Y2.1	100 mg
Fenvalerate	22Y4.1	100 mg
Fluazinam	22Y6.1	100 mg
Fluconazole	22Y7.1	100 mg
Flumetralin	22Y8.1	100 mg
Flutriafol	22Y9.1	100 mg
Forchlorfenuron	22YA.1	100 mg
Glyphosate	22YE.1	100 mg
Hexamethylindanopyran (HHCB)	22YK.1	100 mg
Hymexazol	22YL.1	100 mg
Imazalil	22YN.1	100 mg
Imazamox	22YP.1	100 mg
Imidacloprid	22YT.1	100 mg

Standard Reference Substances



Product name	Art. No.	Pack Qty.
Indoxacarb	22YX.1	100 mg
Irgarol® 1051	22YY.1	100 mg
Isoprocarb	230A.1	100 mg
Isoproturon	230C.1	100 mg
Iodosulfuron-methyl-sodium	230K.1	100 mg
Ketoconazole	230L.1	100 mg
Kresoxim-methyl	230N.1	100 mg
Malathion	230X.1	100 mg
Mebendazole	230Y.1	100 mg
Mesosulfuron-methyl	2311.1	100 mg
Metaxyl	231A.1	100 mg
Metamitron	231C.1	100 mg
Methiocarb	231E.1	100 mg
Methomyl	231K.1	100 mg
Methoxychlor (DMTD)	231L.1	100 mg
Methoxyfenozide	231N.1	100 mg
6-Methyl-2-thiouracil	231P.1	100 mg
Metolachlor	231T.1	100 mg
Miconazole	231X.1	100 mg
Mitotane (2,4'-DDD)	231Y.1	100 mg
Monolinuron	232C.1	100 mg
Myclobutanil	232E.1	100 mg
Nicosulfuron	232H.1	100 mg
Nitenpyram	232K.1	100 mg
Nitrofen	232L.1	100 mg
Oxamyl	232T.1	100 mg
Oxyfluorfen	232X.1	100 mg
Pacllobutrazol	232Y.1	100 mg
Paraquat dichloride	233A.1	100 mg
Pentylentetrazole	233H.1	100 mg
Permethrin	233L.1	100 mg
Phosalone	233N.1	100 mg
Phthalimide	233P.1	100 mg
Picardin	233T.1	100 mg
Primidone	234A.1	100 mg
Pristane	234C.1	100 mg
Propargite	234H.1	100 mg
Pyraclostrobin	234N.1	100 mg
Pyrazine	234P.1	100 mg
Pyrimethamine	234T.1	100 mg
Pyrimethanil	234X.1	100 mg
Quinclorac	235A.1	100 mg
Quinoxifen	235E.1	100 mg
Quizalofop-P-ethyl	235K.1	100 mg
Spiroxamine	235N.1	100 mg
Tebufenozide	236A.1	100 mg
Tebufenpyrad	236C.1	100 mg
Tetracycline	236H.1	100 mg
Thiamethoxam	236P.1	100 mg
Thiourea	236T.1	100 mg
Tolfenpyrad	237C.1	100 mg
Toluol-2,6-diisocyanat (2,6-TDI)	237E.1	100 mg

Product name	Art. No.	Pack Qty.
Tolytriazole	237H.1	100 mg
Triadimenol	237L.1	100 mg
Tribenuron-methyl	237P.1	100 mg
Trifloxystrobin	237X.1	100 mg
Amitrole	22N2.1	250 mg
Captan	22NC.1	250 mg
Carbaryl	22NK.1	250 mg
Carbendazim	22NN.1	250 mg
Chloridazon	22NY.1	250 mg
Chlormequat chloride	22P2.1	250 mg
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	22P3.1	250 mg
Cyromazine	22T3.1	250 mg
Dicamba	22TA.1	250 mg
Dichlobenil	22TC.1	250 mg
Dichlone	22TE.1	250 mg
Dichlorprop	22TK.1	250 mg
Difenoconazole	22TX.1	250 mg
N,N'-Diphenylurea	22X4.1	250 mg
Diuron	22X5.1	250 mg
Fenazox	22XX.1	250 mg
Fentin-oxide	22Y3.1	250 mg
Ivermectine	230H.1	250 mg
Lindane (γ-HCH, γ-BHC)	230T.1	250 mg
Nitrofurazone	232N.1	250 mg
Pendimethalin	233E.2	250 mg
Piperazine	233X.1	250 mg
Prochloraz	234E.1	250 mg
Propyzamide	234L.1	250 mg
Quintozene	235H.1	250 mg
Simazine	235L.1	250 mg
Tartrazine	235Y.1	250 mg
1,2,3,6-Tetrahydrophthalimide	236N.1	250 mg
Thiophanate-methyl	236X.1	250 mg
2-Thiouracil	236Y.1	250 mg
Thiram	237A.1	250 mg
Triadimefon	237K.1	250 mg
1,2,4-Triazole	237N.1	250 mg
Tributylchlorotin (TBTC)	237T.1	250 mg
Benzanthrone	22N6.1	500 mg
Uracil	238C.1	500 mg
4-Ethylmorpholine	22XL.1	1,000 mg
Pendimethalin	233E.1	1,000 mg
Squalane	235P.1	1,000 mg
Sulfolan	235T.1	1,000 mg
λ-Cyhalothrin	22PX.1	100 mg

For safety information and additional data, see our current catalogue or at www.carlroth.com

SPE Phases for Environmental Analysis



SPE polypropylene column CHROMABOND® PFAS

Macherey-Nagel.

Special phase for PFAS analysis.

For SPE enrichment of PFAS from water, textiles and sediments (contaminated soils). Polymeric combination phase with weak anion exchanger, highly porous, spherical particles.

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	300	6 x 5 units	1P9H.1	30 unit(s)

SPE polypropylene column CHROMABOND® HR-P AOX

Macherey-Nagel.

Extraction of AOX from water containing high salt loads (DIN 38409 – H22)

Special polystyrene/divinylbenzene phase

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	200	6 x 5 units	1YLT.1	30 unit(s)
6	500	6 x 5 units	CN43.1	30 unit(s)

SPE polypropylene column CHROMABOND® SA/SiOH

Macherey-Nagel.

Extraction of PCBs from waste oil

Special combination phase:

- **SA:** strongly acidic cation exchanger based on silica with benzenesulphonic acid modification
- **SiOH:** unmodified silica for removal of polar compounds

Similar phases: Bakerbond™ PCB-N

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
3	500/500	10 x 5 units	CN42.1	50 unit(s)
3	500/500	5 x 50 units	CN42.2	250 unit(s)

SPE polypropylene column CHROMABOND® NAN

Macherey-Nagel.

Enrichment of PCBs from sludge

Special combination phase:

- **N:** sodium sulphate for removal of trace water
- **A:** SiOH/AgNO₃ phase for removal of sulphur, sulphur-containing and polar compounds

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
3	400/1400/400	10 x 5 units	4786.1	50 unit(s)
6	700/2000/700	6 x 5 units	4789.1	30 unit(s)
6	700/2000/700	5 x 50 units	4789.2	250 unit(s)

SPE polypropylene column CHROMABOND® C18 PAH

Macherey-Nagel.

Enrichment of PAHs from water

Special octadecyl modified silica, not endcapped

Similar phases: Bakerbond™ Octadecyl Lightload

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	2000	6 x 5 units	4713.1	30 unit(s)

SPE polypropylene column CHROMABOND® NH₂/C₁₈

Macherey-Nagel.

Enrichment of PAHs from water containing humic acid

Special combination phase:

- **NH₂:** aminopropyl phase for removal of interfering humic acids
- **C₁₈:** octadecyl phase for enrichment of PAHs

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	500/500	6 x 5 units	4783.1	30 unit(s)
6	500/1000	6 x 5 units	4785.1	30 unit(s)

SPE polypropylene column CHROMABOND® CN/SiOH

Macherey-Nagel.

Enrichment of PAHs from soil

Special combination phase:

- **CN:** Cyanopropyl phase for selective adsorption of polycyclic aromatics via π-π interactions
- **SiOH:** Unmodified silica phase for removal of polar components

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	500/1000	6 x 5 units	2995.1	30 unit(s)
6	500/1000	5 x 50 units	2995.2	250 unit(s)

SPE polypropylene column CHROMABOND® Combi-Kit PCB

Macherey-Nagel.

Extraction of PCBs from oil with reference to DIN 51527, part 1

Components

CHROMABOND® SiOH-H₂SO₄/SA and CHROMABOND® SiOH (25 pieces each)

- **SiOH-H₂SO₄:** H₂SO₄-impregnated silica phase for oxidation of accompanying compounds to ionic and/or polar compounds
- **SA:** strongly acidic cation exchanger based on silica with benzenesulphonic acid modification for removal of ionic and sulphur containing compounds
- **SiOH:** Unmodified, slightly acidic silica gel

Storage temperature: +4 °C . Danger H314

Column vol. (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
3	SiOH-H ₂ SO ₄ /SA: 500/500 mg + SiOH: 500	25x SiOH-H ₂ SO ₄ /SA, 25x SiOH	4793.1	1 kit

Solvents for Residue Analysis

ROTISOLV® Pestilyse® Solvents

for residue and environmental analysis

Field of application: 'Pesticide Residue Analysis' (via ECD, PND detection) in sectors environment, foodstuff, water, etc. ROTISOLV® Pestilyse® solvents are ideal as extraction agents and for sample preparation.

Properties:

- Highest purity
- Quality control via ECD and PND
- Non-volatile parts: 5 ppm or less
- Specially purified for application in pesticide residue analysis

Product name	Brand	Purity	Art. No.	Pack Qty.			
Acetic acid ethyl ester	ROTISOLV® Pestilyse®	≥99,8 %	T164.2	1 l			
			T164.1	2.5 l			
			T164.3	4 l			
Acetone	ROTISOLV® Pestilyse®	≥99,8 %	T161.2	1 l			
			T161.1	2.5 l			
			T161.3	4 l			
Acetonitrile	ROTISOLV® Pestilyse®	≥99,9 %	T168.1	2.5 l			
			T168.3	4 l			
			T163.2	1 l			
Cyclohexane	ROTISOLV® Pestilyse®	≥99,5 %	T163.1	2.5 l			
			T163.3	4 l			
			T162.2	1 l			
Dichloromethane	ROTISOLV® Pestilyse®	≥99,8 %	T162.1	2.5 l			
			T162.3	4 l			
			T162.2	1 l			
Diethyl ether	ROTISOLV® Pestilyse®	≥99,8 %, stabilised	T900.1	2.5 l			
			n-Heptane	ROTISOLV® Pestilyse®	≥99 %	X878.1	2.5 l
						T861.2	1 l
n-Hexane	ROTISOLV® Pestilyse®	≥99 %	T861.1	2.5 l			
			ROTISOLV® Pestilyse®	≥97,5 %	T165.2	1 l	
					T165.1	2.5 l	
Isohexane	ROTISOLV® Pestilyse®	≥99 %	T165.3	4 l			
			Isooctane	ROTISOLV® Pestilyse®	≥99,5 %	T904.1	2.5 l
						T167.1	2.5 l
Methanol	ROTISOLV® Pestilyse®	≥99,9 %	T169.2	1 l			
			T169.1	2.5 l			
			T169.3	4 l			
n-Pentane	ROTISOLV® Pestilyse®	≥99 %	T903.2	1 l			
			T903.1	2.5 l			
			T170.2	1 l			
Petroleum ether 40–60 °C	ROTISOLV® Pestilyse®		T170.1	2.5 l			
			T170.3	4 l			
			T170.3	4 l			
2-Propanol	ROTISOLV® Pestilyse®	≥99,8 %	T902.1	2.5 l			
			T166.2	1 l			
			T166.1	2.5 l			
Toluene	ROTISOLV® Pestilyse®	≥99,8 %	T166.3	4 l			
			T166.1	2.5 l			
			T166.3	4 l			
Trichloromethane/Chloroform	ROTISOLV® Pestilyse®	≥99,8 %	T901.1	2.5 l			
Water	ROTISOLV® Pestilyse®		T905.1	2.5 l			

For safety information and additional data, see our current catalogue or at www.carlroth.com

ROTISOLV® Pestilyse® plus Solvents

for determination of dioxines, furanes, PCBs, pesticides, hydrocarbons and further pollutants

Carl ROTH created this product line (ROTISOLV® Pestilyse® plus) especially to address the growing requirements in residue analysis. Several relevant parameters are specified for these solvents which allow the use in various applications. With this product line, Carl ROTH sets the benchmark for residue analysis solvents in terms of purity and quality.

Properties:

- Highest purity
- Controlled by FID, ECD and NP
- PAH tested
- Tested for hydrocarbons C₁₄-C₄₀
- Tested for fluorescence
- Volatile impurities: max. 5 ppm
- Non-volatile impurities: max. 5 ppm

Product name	Brand/Purity	Art. No.	Pack Qty.
Acetic acid ethyl ester	ROTISOLV® Pestilyse® plus ≥99,9 %	7565.1	2.5 l
Acetone	ROTISOLV® Pestilyse® plus ≥99,9 %	7535.1	2.5 l
Acetonitrile	ROTISOLV® Pestilyse® plus ≥99,9 %	1HP5.1	2.5 l
Cyclohexane	ROTISOLV® Pestilyse® plus ≥99,9 %	7542.1	2.5 l
Dichloromethane	ROTISOLV® Pestilyse® plus ≥99,9 %	7562.1	2.5 l
Ethanol	ROTISOLV® Pestilyse® plus ≥99,9 %	1HP6.1	2.5 l
n-Heptane	ROTISOLV® Pestilyse® plus ≥99 %	7566.1	2.5 l
n-Hexane	ROTISOLV® Pestilyse® plus ≥99 %	7573.1	2.5 l
	ROTISOLV® Pestilyse® plus ≥96 %	7567.1	2.5 l
Isohexane	ROTISOLV® Pestilyse® plus ≥96 %	7576.1	2.5 l
Isooctane	ROTISOLV® Pestilyse® plus ≥99,7 %	7580.1	2.5 l
Methanol	ROTISOLV® Pestilyse® plus ≥99,9 %	7583.1	2.5 l
n-Pentane	ROTISOLV® Pestilyse® plus ≥99 %	7587.1	2.5 l
Petroleum ether 40–60 °C	ROTISOLV® Pestilyse® plus	7588.1	2.5 l
2-Propanol	ROTISOLV® Pestilyse® plus ≥99,9 %	7590.1	2.5 l
Toluene	ROTISOLV® Pestilyse® plus ≥99,8 %	7591.1	2.5 l
Trichloromethane/Chloroform	ROTISOLV® Pestilyse® plus ≥99,9 %	7554.1	2.5 l

For safety information and additional data, see our current catalogue or at www.carlroth.com



► At Carl ROTH you will find the right product for every application. In addition to our solvents for residue analysis, Carl ROTH also offers you a broad portfolio of solvents for common chromatographic applications such as HPLC and GC.



Determination of the Hydrocarbon Index

The hydrocarbon index is defined as the total of all organic substances that can be extracted with hexane, but cannot be adsorbed by Florisil® (magnesium silicate). On a covalent GC column, these elute between *n*-decane and *n*-tetracontane and have a boiling range of 175–525 °C. These include heating oils, diesel fuels, kerosene, lubricants and transmission fluids. Petrols are not detected using this method.

Carl ROTH offers an extensive range of products for the determination of the hydrocarbon index in accordance with **EN ISO 9377-2-Mod. (DIN H53)**.

Standards

According to **EN ISO 9377-2-Mod. (DIN H53)**

- Manufactured in accordance with **ISO 17034** in an accredited environment
- Tested in a laboratory accredited to **ISO/IEC 17025**
- Ideal for calibration of GC-FID, GC-TCD, GC-ECD, GC-MS, GC-MS/MS, LC-UV, LC-MS and LC-MS/MS
- With an detailed, batch-related certificate of analysis



Determination of the Hydrocarbon Index

Product name	Purity	Pack.	Art. No.	Pack Qty.
<i>n</i> -Alkane standard solution (C ₁₀ -C ₄₀ , all even)	16 components (each 50 mg/l) in <i>n</i> -hexane	glass ampoule	1772.1	1 ml
	16 components (each 100 mg/l) in <i>n</i> -hexane/petroleum ether	glass ampoule	1772.2	5 ml
<i>n</i> -Alkane standard solution (C ₇ , C ₈ , C ₉ , C ₁₀ -C ₄₀ , all even)	19 components (each 50 mg/l) in isooctane	glass ampoule	9331.1	5 ml
		glass ampoule	9629.1	5 ml
Diesel	≥99 %	glass ampoule	1PHK.1	1 ml
		glass	1PHK.2	100 ml
		glass	1PHK.3	250 ml
Extraction solvent stock solution	20 µl/l <i>n</i> -decane and 20 mg/l <i>n</i> -tetracontane in <i>n</i> -hexane	glass ampoule	1750.2	10 ml
Florisil® quality control standard	1 000 mg/l mineral oil and diesel in <i>n</i> -hexane	glass ampoule	9334.1	5 ml
Standard mixture of mineral oils	500 mg/l mineral oil and diesel in acetone	glass ampoule	1774.2	5 ml
	5 000 mg/l mineral oil and diesel in <i>n</i> -hexane	glass ampoule	1773.2	5 ml
	10 000 mg/l mineral oil and diesel in <i>n</i> -hexane	glass ampoule	1XX9.1	5 ml
		glass ampoule	1XX9.2	10 ml
		glass ampoule	1LCE.1	1 ml
		glass ampoule	1LCE.2	5 ml
		10 000 mg/l mineral oil and diesel in <i>n</i> -heptane	glass ampoule	1XXA.1
Stearyl stearate test solution	50/50 mineral oil and diesel, solvent-free	glass ampoule	1LCH.1	1 ml
	2 000 mg/l in <i>n</i> -hexane	glass ampoule	1LCH.2	5 ml
Stearyl stearate test solution	2 000 mg/l in <i>n</i> -hexane	glass ampoule	1760.2	10 ml

For safety information and additional data, see our current catalogue or at www.carlroth.com

Additional Chemicals for Determination of the Hydrocarbon Index

Product name	Brand/Purity	Pack.	Art. No.	Pack Qty.
Acetone	ROTISOLV® Pestilyse® plus ≥99,9 %	glass	7535.1	2.5 l
Florisil®	for hydrocarbon index analysis, 60–100 mesh	plastic	CN39.1	100 g
		plastic	CN39.3	500 g
		plastic	CN39.2	1 kg
		plastic	CN39.4	2.5 kg
<i>n</i> -Hexane	ROTISOLV® ≥95 %, GC Ultra Grade	glass	KK48.1	2.5 l
	ROTISOLV® Pestilyse® plus ≥96 %	glass	7567.1	2.5 l
	ROTISOLV® Pestilyse® ≥97,5 %	glass	T165.2	1 l
		glass	T165.1	2.5 l
Hydrochloric acid	ROTIPURAN® ≥25 %, p.a., ISO	glass	T165.3	4 l
		glass	6331.1	1 l
		plastic	6331.3	1 l
		glass	6331.2	2.5 l
		plastic	6331.4	2.5 l
Magnesium sulphate heptahydrate	≥99 %, p.a., ACS	plastic	6331.5	10 l
		plastic	6331.7	25 l
		plastic	P027.1	500 g
		plastic	P027.2	1 kg
Petroleum ether 40–60 °C	ROTISOLV® Pestilyse® plus	plastic	P027.3	2.5 kg
		glass	7588.1	2.5 l
		glass	T170.2	1 l
Sodium sulphate	ROTISOLV® Pestilyse®	glass	T170.1	2.5 l
		glass	T170.3	4 l
		plastic	0966.1	500 g
		plastic	0966.2	1 kg
	≥99 %, p.a., ACS, anhydrous, grained	plastic	0966.3	5 kg

For safety information and additional data, see our current catalogue or at www.carlroth.com

Accessories for Determination of the Hydrocarbon Index



SPE glass column CHROMABOND® Na₂SO₄/Florisil®

Macherey-Nagel. Material: glass (borosilicate type I) with glass fiber (GF) filter elements.

For environmental analysis

Extraction of hydrocarbons from water acc. to **DIN H53 / ISO DIS 9377-4**

Special combination phase of sodium sulphate and Florisil®

Column volume (ml)	Filling quantity (mg)	Pack.	Art. No.	Pack Qty.
6	2000/2000	6 x 5 units	N744.1	30 unit(s)
6	2000/2000	5 x 50 units	N744.2	250 unit(s)



Hydrocarbons in water acc. to ISO DIS 9377-4 / DIN H-53

Internal standard solution:

Solve 20 mg *n*-tetracontane (C₄₀H₈₂) in cyclohexane, add 20 ml *n*-nonane (C₉H₂₀) and fill up to 1 l with cyclohexane (corresponds to extraction agent stock solution, Art. No. 1750.2). To prepare the extraction standard solution dilute the stock solution with cyclohexane 1:10 immediately before use.

Sample pretreatment:

Adjust 900 ml water (10 °C) to pH 2 with HCl and add 80 g MgSO₄. Add 50 ml of the extraction solution, close the bottle, and stir the suspension intensively for 30 min. Add water and separate the organic from the aqueous phase.

Column conditioning: 5 ml cyclohexane

Sample application:

Slowly force or aspirate the organic solution through the column (SPE glass column CHROMABOND® Na₂SO₄/Florisil®, Art. No. N744.1).

Elution: Wash with 10 mL cyclohexane.

Evaporation:

Evaporate the combined organic solutions carefully to 1 ml or less. If necessary, fill up to 1 ml exactly. (Evaporation to 1 ml can be unnecessary, if the hydrocarbon content is high.)

Further analysis:

Gas chromatography (GC Capillary Columns ROTI®Cap-5 HT, ROTI®Cap-5, ROTI®Cap-1)

GC Capillary Columns ROTI®Cap-5 HT

Silarylene Phase

- **Non-polar**
- Selectivity similar to a **5 % phenyl – 95 % methylpoly-siloxane phase**
- Low column bleed
- **Application areas:** simulated distillation, hydrocarbon, fuel, oil analysis, high boiling analytes, ideal for MS detectors

Similar phases:

- DB-5HT, VF-5HT, HT-5, XTI-5HT, ZB-5HT
- Equivalent to USP phases G27/G36

Column length	Ø internal	Film thickness	Art. No.	Pack Qty.
15 m	0.25 mm	0.10 µm	3883.1	1 unit(s)
	0.32 mm		3884.1	1 unit(s)
	0.25 mm	0.25 µm	3885.1	1 unit(s)
	0.32 mm		3888.1	1 unit(s)
30 m	0.25 mm	0.10 µm	3889.1	1 unit(s)
	0.32 mm		3890.1	1 unit(s)
	0.25 mm	0.25 µm	3891.1	1 unit(s)
	0.32 mm		3892.1	1 unit(s)

GC Capillary Columns ROTI®Cap-5

5 % Phenyl – 95 % Methylpolysiloxane

- **Non-polar**
- Solvent rinsing applicable
- **Application areas:** standard phase with large range of applications

Similar phases:

- SE-54, SE-52, HP-5, SPB®-5, CP-SIL 8, Rtx-5, 007-5, BP5, MDN-5, AT™-5, ZB-5
- Équivalent aux phases USP G27 / G36

Column length	Ø internal	Film thickness	Art. No.	Pack Qty.
30 m	0.32 mm	0.10 µm	1387.1	1 unit(s)
10 m	0.25 mm	0.25 µm	6253.1	1 unit(s)
25 m	0.20 mm	0.50 µm	6283.1	1 unit(s)
25 m	0.32 mm	1.00 µm	6298.1	1 unit(s)
50 m	0.32 mm	1.00 µm	6324.1	1 unit(s)
30 m	0.25 mm	0.25 µm	CN11.1	1 unit(s)

GC Capillary Columns ROTI®Cap-1

100 % Dimethylpolysiloxane

- **Non-polar**
- Solvent rinsing applicable
- **Application areas:** Excellent column for routine applications.

Similar phases:

- OV-1, DB-1, SE-30, HP-1, SPB®-1, CP-SIL 5 CB, Rtx®-1, 007-1, BP1, MDN-1, AT™-1, ZB-1, OV-101
- Equivalent to USP phases G1/G2/G38

Column length	Ø internal	Film thickness	Art. No.	Pack Qty.
30 m	0.32 mm	0.25 µm	1220.1	1 unit(s)
15 m	0.53 mm	1.00 µm	2849.1	1 unit(s)
15 m	0.32 mm	0.25 µm	6074.1	1 unit(s)
10 m	0.25 mm	0.25 µm	6081.1	1 unit(s)
25 m	0.25 mm	0.25 µm	6135.1	1 unit(s)
25 m	0.32 mm	0.25 µm	6148.1	1 unit(s)
50 m	0.53 mm	5.00 µm	6222.1	1 unit(s)

► Carl ROTH offers you a comprehensive range for a wide range of chromatographic applications in line with environmentally relevant standards. Information on our ROTI®Cap GC capillary columns and accessories for gas chromatography can be found on our website.



Water Analysis

Determination of Water Hardness

Water contains a whole host of salts and other compounds in addition to the gases dissolved in it (oxygen, nitrogen, carbon dioxide). Its most important constituents are magnesium and calcium in the form of their chlorides, sulphates and bicarbonates. These dissolved salts are known as hardeners. The bicarbonates precipitate in the heat (during boiling) as carbonates and are known as carbonate hardness or temporary hardness. The sulphate and chloride compounds are known as permanent hardness or non-carbonate hardness. Total hardness describes the concentration of alkaline earth metal ions in water.

The unit of measurement for water hardness used to be 1 °dH (German degrees of hardness), which corresponds to 10,00 mg CaO or 7,19 mg MgO in one litre of water. Today we use millimoles per litre (mmol/l), whereby 1 °dH corresponds to 0,18 mmol/l of earth metal ions and 1 mmol/l corresponds to 5,6 °dH.



Product name	Purity	Pack.	Art. No.	Pack Qty.
Buffer solution pH 10.00 for complexometry	buffer solution, ready to use	plastic	T188.2	500 ml
			T188.1	1 l
	0,01 mol/l – 0,01 N, volumetric standard solution	plastic	CN34.1	1 l
		ROTI®CUBE	CN34.2	5 l
			CN34.3	10 l
EDTA disodium salt solution	0,1 mol/l – 0,1 N, volumetric standard solution	plastic	K714.1	1 l
			K714.2	5 l
		ROTI®CUBE	K714.3	5 l
			K714.4	10 l
EDTA disodium salt solution A	0,1 mol/l – 0,1 N, volumetric standard solution	plastic	T136.1	1 l
			T137.1	1 l
EDTA disodium salt solution B	0,01783 mol/l – 0,01783 N, volumetric standard solution	ROTI®CUBE	T137.2	5 l
			T137.3	10 l
	p.a.	glass	O112.1	25 g
			O112.2	50 g
			O112.3	100 g
Eriochrome black T (C.I. 14645)	1 % in NaCl, titration	plastic	K860.2	25 g
			K860.1	50 g
			K860.3	100 g
Eriochrome black T indicator solution	0,1 % in ethanol, denatured	glass	1E01.1	100 ml
			K024.5	500 ml
		plastic	K024.1	1 l
			K024.2	5 l
		ROTI®CUBE	K024.3	5 l
			K024.4	10 l
		plastic	K024.7	25 l
			K025.1	1 l
			K025.2	5 l
	1 mol/l – 1 N, volumetric standard solution	plastic	K025.3	5 l
		ROTI®CUBE	K025.4	10 l
Indicator buffer tablets	for the determination of water hardness with EDTA	plastic	7649.1	100 unit(s)
			7649.2	500 unit(s)
Murexide (C. I. 56085)	ACS	glass	T124.1	5 g
			T124.2	25 g
			T124.3	50 g

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Determination of Surfactants

Benzethonium chloride solution is used to measure anionic detergents. In this method, the anionic detergent and the cationic detergent form a 1:1 salt in dichloromethane. The end point of the titration is indicated by methylene blue.

Product name	Purity	Pack.	Art. No.	Pack Qty.
Benzethonium chloride solution	0,004 mol/l – 0,004 M, volumetric standard solution	plastic	9217.1	1 l
			6053.3	100 ml
		glass	6053.1	1 l
			6053.2	2.5 l
		tinplate	6053.4	10 l
			6053.5	25 l
Dimidium bromide	≥95 %, for biochemistry	glass	2217.1	500 mg
			A514.1	10 g
Methylene blue (C. I. 52015)	pure	glass	A514.2	50 g
			A514.3	100 g
Methylene blue indicator solution	0,01 mol/l in water	glass	9953.1	100 ml

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Water Analysis

Determination of Adsorbable Organic Halogen Compounds (AOX)

AOX (adsorbable organic halogens, where X = Cl, Br, I) is a sum parameter that describes the amount of organic halogen compounds in substances such as water, soil and sewage sludge. This parameter is used primarily in waste water analysis. The method for calculating AOX levels is set out in **DIN EN ISO 9562**. The quantity of organically bound halogens in a water sample is measured using either the shaking method or the column method. In the shaking method, the AOX in a sample are bound to activated carbon by shaking. In the column method, the AOX in a sample are bound to activated carbon by the action of flushing the sample through a glass column filled with activated carbon. The quantity of activated carbon, which is defined precisely in each case, is then burned in an oxygen chamber and the hydrogen halide released is measured by means of argentometry. The amount of fluoroorganic compounds present cannot be measured argentometrically.

Product name	Purity	Pack.	Art. No.	Pack Qty.
Charcoal	for AOX determination (column method)	glass	1299.1	10 g
	for AOX determination (shaking method)	glass	1319.1	10 g
4-Chlorophenol solution	200 mg AOX/l	glass	2495.1	100 ml
Hydrochloric acid	0,01 mol/l – 0,01 N, volumetric standard solution	plastic	N075.1	1 l
			6750.4	50 g
			6750.1	250 g
		glass	6750.3	500 g
			6750.2	1 kg
			6750.5	2.5 kg
Potassium iodide	≥99,5 %, p.a., ISO	plastic	6750.6	5 kg
			A136.1	500 g
			A136.2	1 kg
			A136.3	2.5 kg
			A136.4	5 kg
Sodium nitrate	≥99 %, p.a., ACS, ISO	plastic	P033.1	500 g
			P033.2	1 kg
			P033.3	2.5 kg
Sodium sulphite	≥98 %, p.a., ACS, anhydrous	plastic	T133.1	500 ml
			T133.2	1 l
Starch indicator solution	1 % in water, stabilised	plastic		

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Determination of Chemical Oxygen Demand (COD)

COD (chemical oxygen demand) is a measure of all the oxidisable components in water under specific conditions. The water sample is mixed with sulphuric acid and heated together with a defined quantity of potassium dichromate, with silver sulphate added as the catalyst. Chloride must be removed beforehand or masked with mercury sulphate. The remaining potassium dichromate is measured by means of titration, using an ammonium iron(II) sulphate solution and ferroin as the indicator. The equivalent amount of oxygen can then be calculated from the amount of potassium dichromate that is used up.



Product name	Purity	General application	Pack.	Art. No.	Pack Qty.
Ammonium iron(II) sulphate solution	0,12 mol/l – 0,12 N, volumetric standard solution, for COD determination	Acc. to DIN 38409 part H41.	plastic	KK60.1	1 l
Ferroin indicator solution	for sewage analysis, for COD determination	Acc. to DIN 38409 part H41, H43 and H44.	glass	T131.1	100 ml
Mercury(II) sulphate solution 80 g/l	0,02 mol K ₂ Cr ₂ O ₇ /l, volumetric standard solution, potassium dichromate in sulphuric acid, for COD determination	Acc. to DIN 38409 part H41.	glass	X871.1	1 l
				X871.2	2.5 l
Potassium dichromate solution	0,02 mol/l – 0,12 N, volumetric standard solution, for COD determination	Acc. to DIN 38409 part H41 and H43.	plastic	P720.1	1 l
	1/24 mol/l – 0,25 N, volumetric standard solution, for COD determination		plastic	P721.1	1 l
Potassium hydrogen phthalate solution	200 mg CSB/l (0,170 g C ₈ H ₅ KO ₄ /l)	For determination of COD: DIN 38409-41:1980, DEV H41; DIN 38409-44:1992, DEV H44	plastic	2055.1	250 ml
				2055.2	500 ml
Silver sulphate solution	10 g/l in sulphuric acid, for COD determination	Acc. to DIN 38409 part H41.	glass	X870.1	1 l
				X870.2	2.5 l

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Water Analysis

Potassium Permanganate Index

The permanganate index measuring method is carried out in the same way as the COD method, only with potassium permanganate instead of potassium dichromate. This technique is used in drinking water analysis.



Product name	Purity	Pack.	Art. No.	Pack Qty.
Oxalic acid dihydrate	≥99,5 %, p.a., ACS, ISO	plastic	T113.1	500 g
			T113.2	1 kg
			T113.3	2.5 kg
Potassium permanganate solution	0,02 mol/l – 0,1 N, volumetric standard solution	glass	K019.1	1 l
			KK69.1	1 l
di-Sodium oxalate	≥99,5 %, p.a., ACS	plastic	HN39.1	100 g
			HN39.2	250 g
			HN39.3	500 g
Sulphuric acid	2 mol/l – 4 N, volumetric standard solution	plastic	9896.1	500 ml
			9896.2	1 l
Water	doubly distilled	plastic	3478.1	1 l
			3478.4	5 l
			3478.2	10 l
			3478.3	30 l

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Determination of Biological Oxygen Demand (BOD)

BOD (biochemical oxygen demand) is a measure of the amount of oxygen that microorganisms need to break down the organic material in a water sample over a specific period of time. It is important to calculate the oxygen concentration at the start and end of the measuring time, which is usually five days and is expressed as an index (BOD₅). Chemical, electrochemical or physical methods are used for this calculation.

Product name	Purity	Pack.	Art. No.	Pack Qty.
Manganese(II) chloride tetrahydrate	≥99 %, p.a.	plastic	T881.3	100 g
			T881.1	500 g
			T881.2	1 kg
Manganese(II) sulphate monohydrate	≥99 %, p.a., ACS	plastic	4487.1	250 g
			4487.2	500 g
Sodium azide	≥99 %, p.a.	glass	K305.5	50 g
			K305.1	100 g
			K305.2	250 g
			K305.3	500 g
			K305.4	1 kg
Sodium hydroxide	≥98 %, p.a., ISO, in pellets	plastic	6771.3	500 g
			6771.1	1 kg
			6771.4	2.5 kg
			6771.2	5 kg
			6771.6	10 kg
			6771.5	25 kg
Sodium thiosulphate pentahydrate	≥99,5 %, p.a., ACS	plastic	P034.1	500 g
			P034.2	1 kg
			P034.3	2.5 kg
			P034.5	25 kg
Starch indicator solution	1 % in water, stabilised	plastic	T133.1	500 ml
			T133.2	1 l
Sulphuric acid	96 %, p.a., ISO	glass	4623.3	250 ml
			4623.1	1 l
		plastic	4623.4	1 l
			4623.2	2.5 l
		plastic	4623.5	2.5 l
			4623.6	10 l
Zinc iodide	≥98 %, powdered	glass	2730.1	25 g
			2730.2	100 g
			2730.3	250 g

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Determination of Nitrogen acc. to Kjeldahl

The most common technique for measuring the amount of nitrogen in organic matter is the Kjeldahl method, which is used in a wide range of sectors such as environmental analysis, food analysis, water analysis and agricultural analysis, as well as in the pharmaceutical and chemical industries.

Kjeldahl tablets

Product name	Purity	Art. No.	Pack Qty.
Kjeldahl tablets antifoam	tablet 1 g	8225.1	250 unit(s)
		8225.2	1,000 unit(s)
Kjeldahl tablets C	tablet 5,1 g	8241.1	250 unit(s)
		8241.2	1,000 unit(s)
Kjeldahl tablets CK	tablet 3,9 g	8243.1	250 unit(s)
		8243.2	1,000 unit(s)
Kjeldahl tablets CT	tablet 5,3 g	9637.1	250 unit(s)
		9637.2	1,000 unit(s)
Kjeldahl tablets CX	tablet 5,5 g	8236.1	250 unit(s)
		8236.2	1,000 unit(s)
Kjeldahl tablets (free of mercury and selenium)	tablet 5 g	HN19.1	250 unit(s)
		HN19.2	1,000 unit(s)
Kjeldahl tablets (free of mercury and selenium)	tablet 2,5 g	HN20.1	250 unit(s)
		HN20.2	1,000 unit(s)
Kjeldahl tablets (Missouri catalyst)	tablet 2,5 g	HN22.1	250 unit(s)
		HN22.2	1,000 unit(s)
Kjeldahl tablets ST	tablet 3,5 g	9693.1	250 unit(s)
		9693.2	1,000 unit(s)
Kjeldahl tablets TCT	tablet 3,71 g	9763.1	250 unit(s)
		9763.2	1,000 unit(s)
Kjeldahl tablets (Wieninger catalyst)	tablet 2,5 g	HN21.1	250 unit(s)
		HN21.2	1,000 unit(s)

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Composition of the Kjeldahl tablets:

Art. No.	Designation	Weight of tablet (g)	Typical composition						
			K ₂ SO ₄	Na ₂ SO ₄	CuSO ₄	CuSO ₄ · 5 H ₂ O	TiO ₂	Se	Anti-foam
HN19	Kjeldahl tablets (mercury and selenium-free)	5	23,10 %	69,30 %	1,80 %	–	2,80 %	–	–
HN20	Kjeldahl tablets (mercury and selenium-free)	2,5	23,10 %	69,30 %	1,80 %	–	2,80 %	–	–
HN21	Kjeldahl tablets (Wieninger catalyst)	2,5	–	96,25 %	1,50 %	–	–	1,50 %	–
HN22	Kjeldahl tablets (Missouri catalyst)	2,5	48,40 %	48,30 %	0,30 %	–	–	–	–
8225	Kjeldahl tablets, anti-foam	1	–	97,00 %	–	–	–	–	3,00 %
8236	Kjeldahl tablets CX	5,5	90,91%	–	–	9,09 %	–	–	–
8241	Kjeldahl tablets C	5,1	98,04 %	–	–	1,96 %	–	–	–
8243	Kjeldahl tablets CK	3,9	89,74 %	–	–	10,26 %	–	–	–
9637	Kjeldahl tablets CT	5,3	94,34 %	–	–	2,83 %	2,83 %	–	–
9693	Kjeldahl tablets ST	3,5	99,90 %	–	–	–	–	0,10 %	–
9763	Kjeldahl tablets TCT	3,71	94,34 %	–	–	2,83 %	2,83 %	–	–

Note: 8225 Kjeldahl anti-foam tablets do not contain a catalyst. Please use additional Kjeldahl tablet with catalyst.



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