



Polychlorinated alkanes (PCAs)

Applications

Polychloro-*n*-alkanes (PCAs) or chlorinated paraffins are a class of industrial chemicals used as high-temperature lubricants in metal-working machinery and as flameretardant plasticizers in vinyl plastics. Less common applications include the use as flame-retardants in rubber, paints, adhesives and as sealants.



"SCCP", "MCCP", "LCCP"

Industrially, the PCAs are synthesized by direct chlorination of *n*-alkane feedstock with molecular chlorine at elevated temperatures and pressures, and sometimes in the presence of UV-light. PCAs fall into three categories, C₁₀-C₁₃ (short, "SCCP"), C₁₄-C₁₇ (medium, "MCCP"), and C₁₈₋₂₀-C₃₀ (long, "LCCP"). They are further sub-categorized into their weight content of chlorine, 40-50%, 50-60% and 60-70%.

C₁₀-C₁₃ PCA ("SCCPs" short-chain-chlorinated-paraffines): Listed as Priority Pollutants in the US, Canada, and Europe

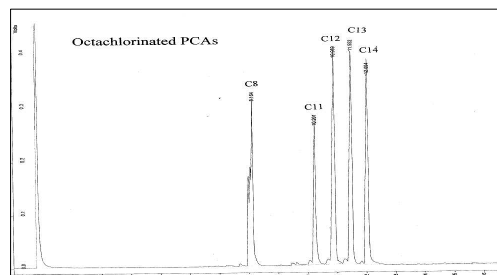
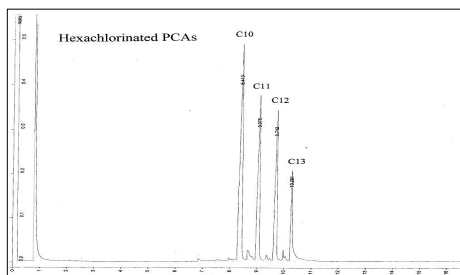
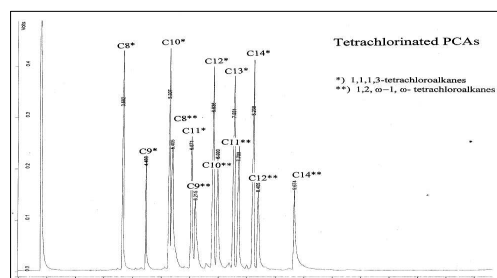
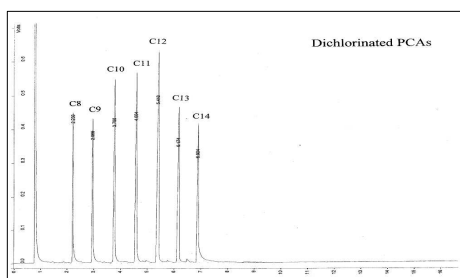
In the US, C₁₀-C₁₃ PCAs have been placed on the US Environmental Protection Agency (EPA) Toxic Release Inventory, in Canada they are classified as "Track 1" Priority Toxic substances under the Canadian Environmental Protection Act, and in Europe the C₁₀-C₁₃ PCAs are included on the list of priority substances in the field of water policy submitted by the Commission of European Communities for the European Parliament and Council Decision.

Analysis of PCAs

PCAs are analyzed by GC using ECD detector, or more sophisticated by high resolution gas chromatography/electron capture negative ion-mass spectrometry (HRGC/ECNI-MS).

Chiron offers a broad range of polychlorinated PCA`s.

The Chiron standards are single molecule compounds and are useful in the quantification and as a standard for PCA determination, for the dividing into the various classes, according to carbon length and chlorine content. The PCAs are C₈-C₂₀ alkanes with a chlorine weight content of 27-73%.



Kits according to carbon chain length

Cat. No.	Compound	Molecular formula	% Weight of Cl
	C8-C9 PCAs		
1664.8-K-IO	1,2-Dichlorooctane	C ₈ H ₁₆ Cl ₂	38,7
1660.8-K-IO	1,1,1,3-Tetrachlorooctane	C ₈ H ₁₄ Cl ₄	56,3
1672.8-K-IO	1,2,7,8-Tetrachlorooctane	C ₈ H ₁₄ Cl ₄	56,3
1656.8-K-IO	1,1,1,3,6,8,8,8-Octachlorooctane	C ₈ H ₁₀ Cl ₈	72,8
1665.9-K-IO	1,2-Dichlorononane	C ₉ H ₁₈ Cl ₂	36,0
1661.9-K-IO	1,1,1,3-Tetrachlorononane	C ₉ H ₁₆ Cl ₄	53,3
1673.9-K-IO	1,2,8,9-Tetrachlorononane	C ₉ H ₁₆ Cl ₄	53,3
1658.9-K-IO	1,1,1,3,8,9-Hexachlorononane	C ₉ H ₁₆ Cl ₄	65,6
1883.8-KIT	C8-C9 PCA Kit		
	C10-C13 PCAs (SCCPs)		
1666.10-K-IO	1,2-Dichlorodecane	C ₁₀ H ₂₀ Cl ₂	33,6
1662.10-K-IO	1,1,1,3-Tetrachlorodecane	C ₁₀ H ₁₈ Cl ₄	50,6
1671.10-K-IO	1,2,9,10-Tetrachlorodecane	C ₁₀ H ₁₈ Cl ₄	50,6
1659.10-K-IO	1,1,1,3,9,10-Hexachlorodecane, isomer mixture	C ₁₀ H ₁₆ Cl ₆	61,0
1622.10-K-IO	1,1,1,3,8,10,10,10-Octachlorodecane	C ₁₀ H ₁₄ Cl ₈	67,9
1667.11-K-IO	1,2-Dichloroundecane	C ₁₁ H ₂₂ Cl ₂	31,5
1649.11-K-IO	1,1,1,3-Tetrachloroundecane	C ₁₁ H ₂₀ Cl ₄	48,2
1674.11-K-IO	1,2,10,11-Tetrachloroundecane	C ₁₁ H ₂₀ Cl ₄	48,2
1650.11-K-IO	1,1,1,3,10,11-Hexachloroundecane, isomer mixture	C ₁₁ H ₁₈ Cl ₆	58,6
1623.11-K-IO	1,1,1,3,9,11,11,11-Octachloroundecane	C ₁₁ H ₁₆ Cl ₈	65,7
1668.12-K-IO	1,2-Dichlorododecane	C ₁₂ H ₂₄ Cl ₂	29,6
1663.12-K-IO	1,12-Dichlorododecane	C ₁₂ H ₂₄ Cl ₂	29,6
1651.12-K-IO	1,1,1,3-Tetrachlorododecane	C ₁₂ H ₂₂ Cl ₄	46,0
1675.12-K-IO	1,2,11,12-Tetrachlorododecane	C ₁₂ H ₂₂ Cl ₄	46,0
1652.12-K-IO	1,1,1,3,11,12-Hexachlorododecane, isomer mixture	C ₁₂ H ₂₂ Cl ₄	46,0
1624.12-K-IO	1,1,1,3,10,12,12,12-Octachlorododecane	C ₁₂ H ₁₈ Cl ₈	63,6
1669.13-K-IO	1,2-Dichlorotridecane	C ₁₃ H ₂₆ Cl ₂	28,0
1653.13-K-IO	1,1,1,3-Tetrachlorotridecane	C ₁₃ H ₂₄ Cl ₄	44,0
1654.13-K-IO	1,1,1,3,12,13-Hexachlorotridecane, isomer mixture	C ₁₃ H ₂₂ Cl ₆	54,4
1625.13-K-IO	1,1,1,3,11,13,13,13-Octachlorotridecane	C ₁₃ H ₂₀ Cl ₈	61,7
1884.20-KIT	C10-C13 PCA Kit		
	C14+ PCAs (MCCPs)		
1670.14-K-IO	1,2-Dichlorotetradecane	C ₁₄ H ₂₈ Cl ₂	26,5
1676.14-K-IO	1,1,1,3-Tetrachlorotetradecane	C ₁₄ H ₂₆ Cl ₄	42,2
1677.14-K-IO	1,2,13,14-Tetrachlorotetradecane	C ₁₄ H ₂₆ Cl ₄	42,2
1678.14-K-IO	1,1,1,3,12,12,12,14-Octachlorotetradecane	C ₁₄ H ₂₂ Cl ₈	59,8
8506.15-K-IO	1,1,1,3,14,15-Hexachloropentadecane	C ₁₅ H ₂₆ Cl ₆	52,5
8507.16-K-IO	1,1,1,3,14,16,16,16-Octachlorohexadecane	C ₁₆ H ₂₆ Cl ₈	56,6
8508.17-K-IO	1,1,1,3,15,17,17,17-Octachloroheptadecane	C ₁₇ H ₂₈ Cl ₈	55,0
2051.18-10K-DC	1-Chlorooctadecane	C ₁₈ H ₃₉ Cl	12,2
8509.18-K-IO	1,1,1,3,16,18,18,18-Octachlorooctadecane	C ₁₈ H ₃₂ Cl ₈	53,6
8510.19-K-IO	1,1,1,3,17,19,19,19-Octachlorononadecane	C ₁₉ H ₃₄ Cl ₈	52,2
8511.20-K-IO	1,1,1,3,18,20,20,20-Octachloroeicosane	C ₂₀ H ₃₆ Cl ₈	50,9
1885.11-KIT	C14+ PCA Kit		

Kits according to degree of chlorination

1879.8-KIT	Dichloroalkane Kit	8 compounds	% weight of Cl 26,5—38,7
1880.13-KIT	Tetrachloroalkane Kit	13 compounds	% weight of Cl 42,2—56,3
1881.6-KIT	Hexachloroalkane Kit	6 compounds	% weight of Cl 52,5—65,6
1882.11-KIT	Octachloroalkane Kit	11 compounds	% weight of Cl 50,9—72,8



Kits according to degree of chlorination

Cat.No.	Compound name	Molecular formula	% Weight of Cl
	Dichloroalkanes		
1664.8-K-IO	1,2-Dichlorooctane	C ₈ H ₁₆ Cl ₂	38,7
1665.9-K-IO	1,2-Dichlorononane	C ₉ H ₁₈ Cl ₂	36,0
1666.10-K-IO	1,2-Dichlorodecane	C ₁₀ H ₂₀ Cl ₂	33,6
1667.11-K-IO	1,2-Dichloroundecane	C ₁₁ H ₂₂ Cl ₂	31,5
1668.12-K-IO	1,2-Dichlorododecane	C ₁₂ H ₂₄ Cl ₂	29,6
1663.12-K-IO	1,12-Dichlorododecane	C ₁₂ H ₂₄ Cl ₂	29,6
1669.13-K-IO	1,2-Dichlorotridecane	C ₁₃ H ₂₆ Cl ₂	28,0
1670.14-K-IO	1,2-Dichlorotetradecane	C ₁₄ H ₂₈ Cl ₂	26,5
1879.8-KIT	Dichloroalkane Kit		
	Tetrachloroalkanes		
1672.8-K-IO	1,2,7,8-Tetrachlorooctane	C ₈ H ₁₄ Cl ₄	56,3
1660.8-K-IO	1,1,1,3-Tetrachlorooctane	C ₈ H ₁₄ Cl ₄	56,3
1673.9-K-IO	1,2,8,9-Tetrachlorononane	C ₉ H ₁₆ Cl ₄	53,3
1661.9-K-IO	1,1,1,3-Tetrachlorononane	C ₉ H ₁₆ Cl ₄	53,3
1671.10-K-IO	1,2,9,10-Tetrachlorodecane	C ₁₀ H ₁₈ Cl ₄	50,6
1662.10-K-IO	1,1,1,3-Tetrachlorodecane	C ₁₀ H ₁₈ Cl ₄	50,6
1674.11-K-IO	1,2,10,11-Tetrachloroundecane	C ₁₁ H ₂₀ Cl ₄	48,2
1649.11-K-IO	1,1,1,3-Tetrachloroundecane	C ₁₁ H ₂₀ Cl ₄	48,2
1675.12-K-IO	1,2,11,12-Tetrachlorododecane	C ₁₂ H ₂₂ Cl ₄	46,0
1651.12-K-IO	1,1,1,3-Tetrachlorododecane	C ₁₂ H ₂₂ Cl ₄	46,0
1653.13-K-IO	1,1,1,3-Tetrachlorotridecane	C ₁₃ H ₂₄ Cl ₄	44,0
1677.14-K-IO	1,2,13,14-Tetrachlorotetradecane	C ₁₄ H ₂₆ Cl ₄	42,2
1676.14-K-IO	1,1,1,3-Tetrachlorotetradecane	C ₁₄ H ₂₆ Cl ₄	42,2
1880.13-KIT	Tetrachloroalkane Kit		
	Hexachloroalkanes		
1658.9-K-IO	1,1,1,3,8,9-Hexachlorononane	C ₉ H ₁₆ Cl ₆	65,6
1659.10-K-IO	1,1,1,3,9,10-Hexachlorodecane	C ₁₀ H ₁₆ Cl ₆	61,0
1650.11-K-IO	1,1,1,3,10,11-Hexachloroundecane	C ₁₁ H ₁₈ Cl ₆	58,6
1652.12-K-IO	1,1,1,3,11,12-Hexachlorododecane	C ₁₂ H ₂₂ Cl ₆	46,0
1654.13-K-IO	1,1,1,3,12,13-Hexachlorotridecane	C ₁₃ H ₂₂ Cl ₆	54,4
8506.15-K-IO	1,1,1,3,14,15-Hexachloropentadecane	C ₁₅ H ₂₆ Cl ₆	52,5
1881.6-KIT	Hexachloroalkane Kit		
	Octachloroalkanes		
1656.8-K-IO	1,1,1,3,6,8,8,8-Octachlorooctane	C ₈ H ₁₀ Cl ₈	72,8
1622.10-K-IO	1,1,1,3,8,10,10,10-Octachlorodecane	C ₁₀ H ₁₄ Cl ₈	67,9
1623.11-K-IO	1,1,1,3,9,11,11,11-Octachloroundecane	C ₁₁ H ₁₆ Cl ₈	65,7
1624.12-K-IO	1,1,1,3,10,12,12,12-Octachlorododecane	C ₁₂ H ₁₈ Cl ₈	63,6
1625.13-K-IO	1,1,1,3,11,13,13,13-Octachlorotridecane	C ₁₃ H ₂₀ Cl ₈	61,7
1678.14-K-IO	1,1,1,3,12,14,14,14-Octachlorotetradecane	C ₁₄ H ₂₂ Cl ₈	59,8
8507.16-K-IO	1,1,1,3,14,16,16,16-Octachlorohexadecane	C ₁₆ H ₂₆ Cl ₈	56,6
8508.17-K-IO	1,1,1,3,15,17,17,17-Octachloroheptadecane	C ₁₇ H ₂₈ Cl ₈	55,0
8509.18-K-IO	1,1,1,3,16,18,18,18-Octachlorooctadecane	C ₁₈ H ₃₂ Cl ₈	53,6
8510.19-K-IO	1,1,1,3,17,19,19,19-Octachlorononadecane	C ₁₉ H ₃₄ Cl ₈	52,2
8511.20-K-IO	1,1,1,3,18,20,20,20-Octachloroeicosane	C ₂₀ H ₃₆ Cl ₈	50,9
1882.11-KIT	Octachloroalkane Kit		