

SOLUTIONS BY



DEXTech Method Optimisation

Introduction

We are continually improving our automated sample preparation system DEXTech for the dioxin and PCB analysis. We are glad to provide our new optimised methods on the following pages.

Achieving the same excellent results as the methods utilised so far these ones are again reducing the process time down to **only 1 hour** (Standard column) and **only 50 min** (SMART column) and the solvent consumption down to **only 400 mL** (Standard column) and **only 300 mL** (SMART column) - including conditioning and fractioning.

You can change the methods according to the specifications given below and store them as additional method on your device.

Overview of Process Times and Solvent Consumptions

Standard column

Process time: only 1 hour Solvent consumption: only 400 mL
Including conditioning and fractioning

Fraction	Dioxin / PCBs		Solvent	
1	ndl PCB	140 mL	n-Hexane	combined
2	mono-ortho PCB	56 mL	Dichloromethane / n-Hexane	
3	non-ortho PCB	8 mL	Toluene	
4	PCDD/F	56 mL	Toluene	

SMART column

Process time: only 50 min. Solvent consumption: only 300 mL
Including conditioning and fractioning

Fraction	Dioxin / PCBs		Solvent	
1	ndl PCB	70 mL	n-Hexane	combined
2	mono-ortho PCB	56 mL	Dichloromethane / n-Hexane	
3	non-ortho PCB	8 mL	Toluene	
4	PCDD/F	56 mL	Toluene	

Optimised Methods

Method Using the Standard Column

Column	Solvent	Process	min.	mL/min.
C3	Toluene	Conditioning 1	0	7
C4	Toluene	Conditioning 2	0	7
C3	DCM/n-Hexane	Conditioning 3	1	7
C4	DCM/n-Hexane	Conditioning 4	1	7
C1	n-Hexane	Conditioning 5	6	7
C1/C2/C3	n-Hexane	Conditioning 6	0	7

Column	Solvent	Process	min.	mL/min.
C1	n-Hexane	Pre run C1 (Waste)	4	7
C1/C2/C3	n-Hexane	Pre run Fraction 1 (Waste)	1	7
C1/C2/C3	n-Hexane	Fraction 1 - ndl PCB (Indicator)	20	7
C2/C4	DCM/n-Hexane	Pre run Fraction 4 (Waste)	7	7
C3	DCM/n-Hexane	Fraction 2 - Mono-Ortho PCB	8	7
C3	Toluene	Fraction 3 - Non-Ortho PCB	8	1
C4	Toluene	Fraction 4 - PCDD/PCDF	8	7
Nitrogen			0*	
Run Time			64	

*Nitrogen = optional

Method Using the SMART Column

Applicable for all matrices with limited matrix effects or reduced sample weight (up to 1.5 g).

Column	Solvent	Process	min.	mL/min.
C3	Toluene	Conditioning 1	0	7
C4	Toluene	Conditioning 2	0	7
C3	DCM/n-Hexane	Conditioning 3	1	7
C4	DCM/n-Hexane	Conditioning 4	1	7
C1	n-Hexane	Conditioning 5	4	7
C1/C2/C3	n-Hexane	Conditioning 6	0	7

Column	Solvent	Process	min.	mL/min.
C1	n-Hexane	Pre run C1 (Waste)	2	7
C1/C2/C3	n-Hexane	Pre run Fraction 1 (Waste)	0,5	7
C1/C2/C3	n-Hexane	Fraction 1 - ndl PCB (Indicator)	10	7
C2/C4	DCM/n-Hexane	Pre run Fraction 4 (Waste)	7	7
C3	DCM/n-Hexane	Fraction 2 - Mono-Ortho PCB	8	7
C3	Toluene	Fraction 3 - Non-Ortho PCB	8	1
C4	Toluene	Fraction 4 - PCDD/PCDF	8	7
Nitrogen			0*	
Run Time			49,5	

*Nitrogen = optional

Methods Reusing the Carbon Columns

A significant reduction of costs per sample can be achieved by reuse of the two carbon columns. Using these columns for twenty cycles acquires a cost saving of up to 30% without compromising the sensitivity of the results. Cross-contamination is reliably avoided.

Method Using the Standard Column and Reusing the Carbon Columns

Column	Solvent	Process	min.	mL/min.
C3	Toluene	Conditioning 1	5	7
C4	Toluene	Conditioning 2	5	7
C3	DCM/n-Hexane	Conditioning 3	1	7
C4	DCM/n-Hexane	Conditioning 4	1	7
C1	n-Hexane	Conditioning 5	6	7
C1/C2/C3	n-Hexane	Conditioning 6	0	7

Column	Solvent	Process	min.	mL/min.
C1	n-Hexane	Pre run C1 (Waste)	4	7
C1/C2/C3	n-Hexane	Pre run Fraction 1 (Waste)	1	7
C1/C2/C3	n-Hexane	Fraction 1 - ndl PCB (Indicator)	20	7
C2/C4	DCM/n-Hexane	Pre run Fraction 4 (Waste)	7	7
C3	DCM/n-Hexane	Fraction 2 - Mono-Ortho PCB	8	7
C3	Toluene	Fraction 3 - Non-Ortho PCB	8	1
C4	Toluene	Fraction 4 - PCDD/PCDF	8	7
Nitrogen			0*	
Run Time			74	

*Nitrogen = optional

Method Using SMART Column and Reusing the Carbon Columns

Applicable for all matrices with limited matrix effects or reduced sample weight (up to 1.5 g).

Column	Solvent	Process	min.	mL/min.
C3	Toluene	Conditioning 1	5	7
C4	Toluene	Conditioning 2	5	7
C3	DCM/n-Hexane	Conditioning 3	1	7
C4	DCM/n-Hexane	Conditioning 4	1	7
C1	n-Hexane	Conditioning 5	4	7
C1/C2/C3	n-Hexane	Conditioning 6	0	7

Column	Solvent	Process	min.	mL/min.
C1	n-Hexane	Pre run C1 (Waste)	2	7
C1/C2/C3	n-Hexane	Pre run Fraction 1 (Waste)	0,5	7
C1/C2/C3	n-Hexane	Fraction 1 - ndl PCB (Indicator)	10	7
C2/C4	DCM/n-Hexane	Pre run Fraction 4 (Waste)	7	7
C3	DCM/n-Hexane	Fraction 2 - Mono-Ortho PCB	8	7
C3	Toluene	Fraction 3 - Non-Ortho PCB	8	1
C4	Toluene	Fraction 4 - PCDD/PCDF	8	7
Nitrogen			0*	
Run Time			59,5	

*Nitrogen = optional

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