Chromatography

MACHEREY-NAGEL

CHROMABOND® WAX / GCB

The ideal combination for PFAS analysis

- Combine concentration and clean-up in one single cartridge
- Eliminate interferences while maintaining highest recovery
- Select the ideal format tailored to your requirements

CHROMABOND® WAX / GCB

Introduction

MACHEREY-NAGEL already provides our customers a comprehensive product portfolio for the analysis of per- and polyfluoroalkyl substances (PFAS). In January 2024, the United States Environmental Protection Agency (US EPA) has published the method 1633 for the analysis of PFAS in aqueous, solid, biosolids, and tissue samples by LC-MS/MS. According to this method, the sample extract is subjected to a cleanup step to remove interferences prior to LC-MS/MS analysis by using carbon (GCB = graphitized carbon black).

Our new bilayer dual-phase SPE cartridge featuring our valued CHROMABOND® WAX for extraction and concentration of PFAS in combination with GCB for sample cleanup, allows to substitute a WAX SPE cartridge and a dispersive Solid Phase extraction (dSPE) with GCB in a powder format. Your value of combining both steps with our new CHROMABOND® WAX/GCB cartridge lies in an optimized sample preparation featuring ease-of-use as well as time and cost saving in accordance with up-to-date regulatory needs.

Recommended application

- Strong acids with $pk_a > 1$
- PFAS from solid, biosolids, and tissue samples as well as highly pigmented matrices e. g. food, feed or environmental samples
- EPA method 1633
- DOD QSM 5.1/5.3

Benefits

By using CHROMABOND® WAX / GCB your profit from:

- SPE phase designed especially for PFAS extraction
- Low PFAS blank designed especially for PFAS extraction
- High ion exchange capacity of ≥ 0.80 meq/g
- High recovery rates and batch-to-batch reproducibility

Extensive certificate of analysis data for each batch to ensure high quality and reliability. The certificate includes:

- Recovery rates of selected analytes
- Blank value levels
- Physiochemical data
- Sorbent elution test
- Technical data

Weak mixed anion exchanger (WAX):

Polystyrene-divinyl benzene copolymer (PS-DVB)

Particle: spherical, 30 µm

pK_a: > 8

Specific surface area: ≥ 800 m^2/g

Pore diameter: 60 – 80 Å

pH-stability: 1 – 14

Ion exchange capacity: ≥ 0.80 meq/g

Graphitized Carbon Black (GCB):

Particle: 120 / 400 mesh (38 – 125 µm)

Specific surface area: ≥ 80 m^2/g

Good to know

- WAX / GCB for PFAS in water samples
- GCB / WAX for PFAS in solids, biosolids and tissue samples

Recovery rate of PFAS analytes from non-potable water (acc. to EPA 1633)

The CHROMABOND® WAX / GCB dual-layer SPE cartridge is the choice for the reliable and successful determination of PFAS components according to EPA 1633 from non-potable water (Application Note 01/2024, https://chromaappdb.mn-net.com/). The dual-layer design of the WAX / GCB column offers optimal performance with reduced effort for sample preparation compared to a separate two-step preparation workflow (Figure 1). The CHROMABOND® WAX / GCB provides recovery rates, which are very comparable to those of competitor products (Figure 2).

Good to know

CHROMABOND® WAX / GCB provides recovery rates, which are very comparable to other competitor products on the market for PFAS analysis

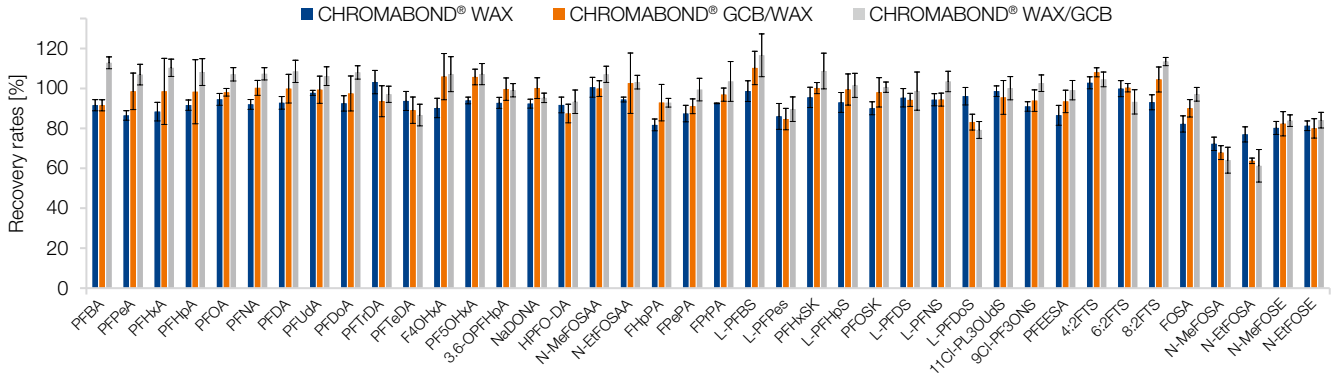

Figure 1: Recovery rates of 40 PFAS using CHROMABOND® WAX, CHROMABOND® GCB / WAX and CHROMABOND® WAX / GCB (200 mg WAX, 50 mg GCB; n = 5). The application was conducted according to EPA 1633.

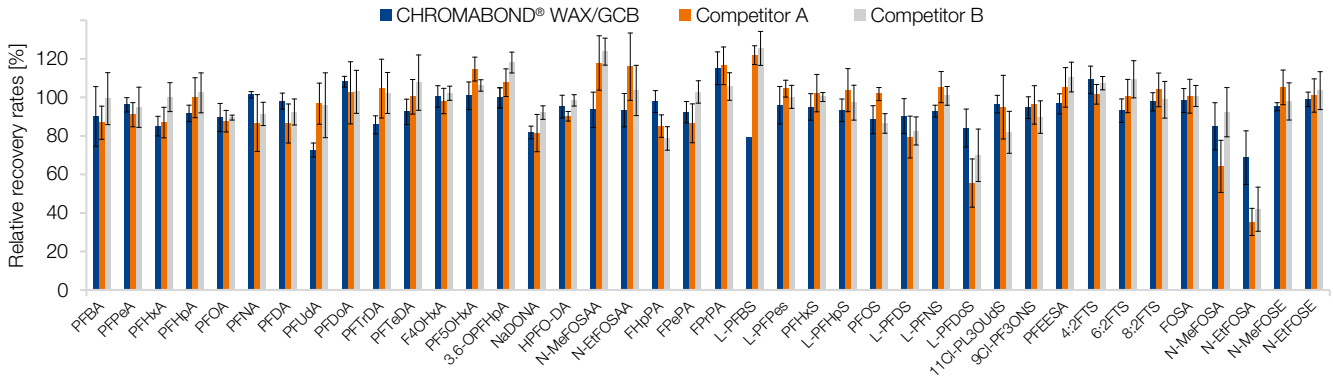

Figure 2: Relative recoverey rates of non-potable water samples (ß = 1,5 ng/L) according to EPA 1633.

PFAS blank value test (batch-based testing on the assembled cartridge)

Acceptance limits	Analytes (CAS)
1 ng/L	PFMPA (377-73-1), PFBA (375-22-4), PFMBA (863090-89-5), PFPeA (2706-90-3), PFEESA (113507-82-7), PFBS (375-73-5), PFHxA (307-24-4), PFPeS (2706-91-4), PFHpA (375-85-9),PFHxS (355-46-4), ADONA (919005-14-4), PFHpS (375-92-8), PFOA (335-67-1), PFOS (1763-23-1), PFNA (375-95-19), 9Cl-PF3ONS (73606-19-6), PFNS (68259-12-1), PFDA (335-76-2), FOSA (754-91-6), PFDS (335-77-3), PFUnDA (2058-94-8), 11Cl-PF3OUdS (763051-92-9), PFDoDA (307-55-1), PFTrDA (72629-94-8), 4:2FTS (757124-72-4), 6:2FTS (27619-97-2), PFDoS (79780-39-5), 8:2FTS (39108-34-4), *N*-MeFOSE (24448-09-7), PFTeDA (376-06-7), *N*-EtFOSE (1961-99-2)
2 ng/L	NFDHA (151772-58-6), HFPO-DA (13252-13-6)
10 ng/L	3:3FTCA (356-02-5), 5:3FTCA (914637-49-3), 7:3FTCA (812-70-4), *N*-MeFOSAA (2355-31-9), *N*-EtFOSAA (2991-50-6), *N*-MeFOSA (31506-32-8), *N*-EtFOSA (4151-50-2)

Table 1: Selected PFAS analytes and their acceptance limits in quality control.

CHROMABOND® WAX / GCB

Ordering information

Volume	Adsorbent weight WAX 150 mg	Adsorbent weight WAX 200 mg	Adsorbent weight WAX 500 mg
CHROMABOND® WAX / GCB* (30 µm) polypropylene columns, 6 mL, 50 mg GCB	7300041	7300043	7300045
CHROMABOND® GCB / WAX* (30 µm) polypropylene columns, 6 mL, 50 mg GCB	7300042	7300044	7300046

* top/bottom

MACHEREY-NAGEL offers a comprehensive and proven product portfolio for your PFAS analysis

Want to know more about our products dedicated to PFAS analysis:

PFAS Flyer

PFAS Landing page

Chromatography Catalog

Chromatography service – Tools and Services for an added value

www.mn-net.com/chromatography-service

Good to know

The MACHEREY-NAGEL application database provides over 3000 chromatography applications examples from HPLC, GC, TLC and SPE and is freely accessible:

https://chromaappdb.mn-net.com/

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