Chromatography

MACHEREY-NAGEL

CHROMABOND® Carbon A

Enrichment of acrylamide from water by SPE

- Base material: activated carbon
- Specific surface: > 1000 m^2/g
- Highly porous, spherical particles
- Meets the DIN 38413-6 standard

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MACHEREY-NAGEL
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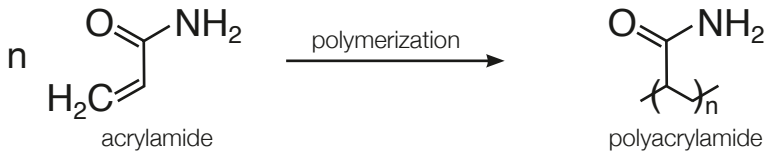
MN Since 1911

CHROMABOND® Carbon A

Introduction

Acrylamide is a synthetic chemical substance which is the starting material for the industrial production of polyacrylamide. The latter is used, e.g., in water treatment as flocculate, food packaging and in the paper industry as binding agent. Especially, the use of non-toxic polyacrylamide as flocculate leads to the release of residual amounts of the neurotoxin acrylamide, remaining from production, into water.



acrylamide polyacrylamide

Furthermore, acrylamide can be formed during the heating process from natural ingredients in food. The risk of formation is particularly high in foods that are fried, roasted, baked or grilled at high temperatures (120–150 °C).[1]

Some examples are listed below:

- Potato chips
- French fries
- Fried potatoes
- Toast
- Snack mixes
- Cracker
- Coffee, coffee extracts and coffee substitutes
- Breakfast cereals

So, acrylamide is taken up by consuming those foods and drinking water. Due to its classification as a Group 2 carcinogen by the International Agency for Research on Cancer (IARC), it is of highest importance to trace any amounts of acrylamide in comestible goods. But up till now the risk of acrylamide uptake from food cannot be determined correctly and thus there are no legal limits.* In contrast, there are legal limits suggested for drinking water: the World Health Organization (WHO) recommends 0.5 µg/L, the European Union recommends 0.1 µg/L.[2] Therefore, a reliable method is of great interest for the analysis of acrylamide in drinking water. CHROMABOND® Carbon A SPE products were particularly designed to meet such needs.

[1] European Food Safety Authority (EFSA) http://www.efsa.europa.eu/en/topics/topic/acrylamide.htm

[2] DIN 38413-6:20007-2: German standard methods for the examination of water, waste water and sludge – Single components (group P) - Part 6: Determination of acrylamide – Methode using high performance liquid chromatography with mass spectrometric detection (HPLC-MS/MS) (P 6).

* For the clean-up of acrylamide from ultra-heated starch-containing food, we suggest CHROMABOND® ABC_{18} columns (REF 730533).

CHROMABOND® Carbon A

Applications

Standard SPE procedure for CHROMABOND® Carbon A

MN Appl. No. 306130

Column type:	CHROMABOND® Carbon A, 6 mL, 1000 mg, REF 730167
Column conditioning:	3 x 6 mL methanol 3 x 6 mL water
Sample application:	5–20 mL/min
Washing:	1–10 mL water
Drying:	5–10 min of vacuum or nitrogen flow
Elution:	3 x 2 mL methanol
Further analysis:	if necessary, evaporate and redissolve in a suitable solvent

Determination of acrylamide from drinking water (spiked sample), according to DIN 38413-6

MN Appl. No. 306140

Column type:	CHROMABOND® Carbon A, 6 mL, 1000 mg, REF 730167
Sample pretreatment:	A sample of drinking water was taken according to DIN 38402. Then, the sample was treated with 100 mg/L sodium thiosulfate pentahydrate to reduce oxidizing species. 40 mg/L sodium azide was added to avoid microbiological degradation. An aliquot of 500 mL of the sample was taken and 50 ng of acrylamide were added.
Column conditioning:	1 x 8 mL methanol 1 x 8 mL water
Sample application:	Sample was aspirated at a flow of 20 mL/min
Washing:	1 mL water
Drying:	15 min of nitrogen or air flow
Elution:	5 x 2 mL methanol
Concentration:	combine eluate fractions and concentrate to 1 mL
Further analysis:	HPLC, according to MN Appl. No. 127530
Column:	EC 150/3 NUCLEODUR® C_{18} Gravity, 3 µm (REF 760083.30)
Eluent A:	0.001 % formic acid in water
Eluent B:	0.001 % formic acid in methanol
Gradient:	10 % B in 10 min to 100 % B, back to 10 % B in 2 min, hold for 5 min
Flow rate:	0.25 mL/min
Temperature:	60 °C
Injection:	10 µL
Detection:	MS/MS
Recovery rate:	81 % (SD: 5 %; n=6)

For further information please visit *www.mn-net.com/apps*

Ordering information

CHROMABOND® Carbon A polypropylene columns

Volume	Adsorbent weight		Pack of
6 mL	500 mg	1000 mg	
	730165	730167	30

CHROMABOND® accessories

Description	Quantity	REF
Vacuum manifold complete consists of: glass cabinet with lid and lid gasket, removable needles on lower side of lid, vacuum gauge, control valve, valves and caps, variable rack		
for up to 12 columns or cartridges (including PP tank)	1	730150
for up to 16 LV columns	1	730360
for up to 24 columns or cartridges	1	730151
Tubing adapters for application of large sample volumes (PTFE tube length approx. 1 m)		
for 1, 3 and 6 mL polypropylene columns	4	730243

More CHROMABOND® accessories are available. For details see our website or contact us directly.

CHROMABOND® Carbon A

Do you need products for subsequent analyses? MACHEREY-NAGEL provides everything from one source for your competitive advantage.

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