

MACHEREY-NAGEL

CHROMABOND[®] Carbon A

Chromatography



Enrichment of acrylamide from water by SPE

- Base material: activated carbon
- Specific surface: > 1000 m²/g
- Highly porous, spherical particles
- Meets the DIN 38413-6 standard



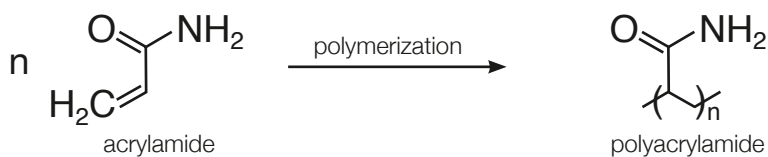
MACHEREY-NAGEL

www.mn-net.com



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.



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® ABC₁₈ columns (REF 730533).



Applications


Standard SPE procedure for CHROMABOND® Carbon A

MN Appl. No. 306130

| | | |
|---|--|---|
|  | Column type: CHROMABOND® Carbon A, 6 mL, 1000 mg, REF 730167 | Washing: 1–10 mL water |
| | Column conditioning: 3 x 6 mL methanol 3 x 6 mL water | Drying: 5–10 min of vacuum or nitrogen flow |
| | Sample application: 5–20 mL/min | 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 | Concentration: combine eluate fractions and concentrate to 1 mL |
| | 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. | Further analysis: HPLC, according to MN Appl. No. 127530 |
| | | Column: EC 150/3 NUCLEODUR® C ₁₈ Gravity, 3 µm (REF 760083.30) |
| Column conditioning: 1 x 8 mL methanol 1 x 8 mL water | Eluent A: 0.001 % formic acid in water | Eluent B: 0.001 % formic acid in methanol |
| Sample application: Sample was aspirated at a flow of 20 mL/min | 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 |
| Washing: 1 mL water | Temperature: 60 °C | Injection: 10 µL |
| Drying: 15 min of nitrogen or air flow | Detection: MS/MS | Recovery rate: 81 % (SD: 5 %; n=6) |
| Elution: 5 x 2 mL methanol | | |



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 730165 | 1000 mg 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.



www.mn-net.com

MACHEREY-NAGEL



MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6-8 · 52355 Düren · Germany

DE / International:

Tel.: +49 24 21 969-0
Fax: +49 24 21 969-199
E-mail: info@mn-net.com

CH:

Tel.: +41 62 388 55 00
Fax: +41 62 388 55 05
E-mail: sales-ch@mn-net.com

FR:

Tel.: +33 388 68 22 68
Fax: +33 388 51 76 88
E-mail: sales-fr@mn-net.com

US:

Tel.: +1 484 821 0984
Fax: +1 484 821 1272
E-mail: sales-us@mn-net.com

