Chromatography

MACHEREY-NAGEL

Adsorbents

Polyamide and other purification media

- Large portfolio of various adsorbents
- For small, medium and large scale purifications
- Consistently high quality

Adsorbents

Overview of adsorbents

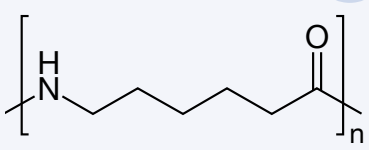
MACHEREY-NAGEL offers a variety of different adsorbents for small, medium and large scale purifications for all kinds of applications. Each adsorbent has its special properties which you can take advantage of.

Adsorbent	Application
Polyamide 6	Separation of lipophilic and hydrophilic substances
Standard silica	Separation of lipophilic substances
Aluminum oxide	Separation of lipophilic substances
Kieselguhr	Separation of hydrophilic substances (after impregnation)
Florisil®	Mainly sample preparation
Cellulose	Separation of hydrophilic substances

Polyamide 6 (ε-polycaprolactam)

Polyamide 6 (ε-polycaprolactam) is widely used for the chromatographic separation of natural products with phenolic functional groups, e.g., flavonoids, anthraquinones, flavonols as well as carboxylic acids and aromatic nitro compounds. Polyamide is produced by hydrolytic polymerization of ε-caprolactam. It possesses a melting temperature of above 200 °C. A special characteristic of this material in comparison with silica and other resins is its water adsorption properties. The saturation concentration at 23 °C is about 9.5 %. The resulted degrees of swelling in different aqueous solutions are displayed in the table below.

Polyamide 6



Degrees of swelling in different aqueous solutions for Polyamide 6

Solution	Swelling rate* [%]
Water (100 %)	2.5
20 % Methanol (v/v methanol / water)	3.7
50 % Methanol (v/v methanol / water)	7.3
50 % Isopropanol (v/v isopropanol / water)	7.1

*Swelling determined after 2 hours saturation

As stationary phase polyamide can be used in normal or reversed phase mode due to its medium polarity. The separation mechanism is mainly based on hydrogen bonding. The elution strength of the solvent increases in the following order: water < methanol < acetone < diluted aq. sodium hydroxide solution < formamide < dimethylformamide.

Polyamide exhibits a good resistance towards aliphatic hydrocarbons (e.g., hexane, heptane), aromatic hydrocarbons (e.g., naphthalene, toluene), esters (e.g., ethyl acetate), ethers (e.g., diethyl ether, dioxane), aldehydes (e.g., formaldehyde), ketones (e.g., acetone) and alcohols (e.g., ethanol, isopropanol, methanol). Polyamide is stable within the pH range of 3 to 9 at 25 °C.

Overview of different polyamide adsorbents for column chromatography

Designation	Particle size	Pack of 1 kg
Polyamide-CC 6	< 0.07 mm	815610.1
Polyamide-CC 6	0.05–0.16 mm	815620.1
Polyamide-CC 6	0.10–0.30 mm	815600.1

CC = column chromatography

Adsorbents

Standard silica 60

Silica is the most important purification medium in chromatography due to its excellent price-performance ratio, versatility and availability. It is prepared by the precipitation of water glass with sulfuric acid. Usually, it is used for lipophilic compounds in normal phase mode. MACHEREY-NAGEL provides different particle sizes and qualities you can choose from.

- Pore size ~ 60 Å
- Pore volume ~ 0.75 mL/g
- Spec. surface BET ~ 500 m^2/g
- Highly porous, amorphous silicic acid in the form of hard, opalescent particles
- Prepared by precipitation of water glass with sulfuric acid
- For higher demands on the performance of column packings we recommend our high-purity irregular POLYGOPREP silicas

Designation	Particle size	Pack of 1 kg	Pack of 5 kg	Pack of 25 kg
Silica 60, 0.015–0.04 mm	–	815650.1	815650.5	815650.25
Silica 60, 0.025–0.04 mm	–	815300.1	815300.5	815300.25
Silica 60, 0.04–0.063 mm	230–400 mesh	815380.1	815380.5	815380.25
Silica 60 M, 0.04–0.063 mm	230–400 mesh	815381.1	815381.5	815381.25
Silica 60, 0.05–0.1 mm	130–270 mesh	815390.1	815390.5	815390.25
Silica 60, 0.05–0.2 mm	70–270 mesh	815320.1	815320.5	815320.25
Silica 60, 0.063–0.2 mm	70–230 mesh	815330.1	815330.5	815330.25
Silica 60, < 0.063 mm	+ 230 mesh	815400.1	815400.5	815400.25
Silica 60, < 0.08 mm	+ 190 mesh	815310.1	815310.5	815310.25
Silica 60, 0.1–0.2 mm	70–130 mesh	815340.1	815340.5	815340.25
Silica 60, 0.2–0.5 mm	35–70 mesh	815350.1	815350.5	815350.25
Silica 60, 0.5–1.0 mm	18–35 mesh	815360.1	815360.5	815360.25

Adsorbents pre-packed in flash cartridges

MACHEREY-NAGEL offers a large portfolio of CHROMABOND® flash cartridges (sizes 4–3000 g) packed with various adsorbents, e.g., irregular silica (40–63 µm and 15–40 µm), spherical silica (15 and 25 µm), octadecyl-(C_{18} ec), amino- and diol-modified silica. Now available upon request are flash cartridges packed with polyamide.

Registraded Trademarks

CHROMABOND®	MACHEREY-NAGEL GmbH & Co. KG (Germany)
Florisil®	U.S. Silica Company (USA)

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