

MACHEREY-NAGEL

NUCLEODUR<sup>®</sup> C18 OA

Chromatography



Your solution for organic acid analysis

- Broad spectrum of application for a wide range of organic acids
- Excellent retention in 100 % aqueous mobile phase
- Specially batch tested for organic acid analysis

Distribútor pre SR:  
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**MACHEREY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)



Fruits and fruit juices are globally traded products. Therefore, monitoring of organic acids is an important parameter for quality control in the processing of juices and related products, as well as for the evaluation of the authenticity and purity of juices.

In addition, the use of organic acids in foods and beverages is regulated in many countries, though regulations vary widely.

## HPLC analysis of 12 organic acids from a standard mixture

### Chromatographic conditions

Analytical column	EC 150/4.6 NUCLEODUR® C18 OA, 5 µm (REF 760688.46)
Eluent A	25 mmol KH <sub>2</sub> PO <sub>4</sub> in water (pH = 2.5, adjusted with phosphoric acid)
Eluent B	methanol
Gradient	0% B for 8.0 min, from 0% to 65% B in 0.5 min, hold 65% B for 5.0 min, from 65% to 0% B in 0.5 min, hold 0% B for 6.5 min
Flow rate	1.0 mL/min
Temperature	25 °C
Injection volume	3 µL
Detection	UV, 210 nm
Sample solution	Standard mixture of 12 organic acids in eluent A, exact concentrations can be found in the application note.

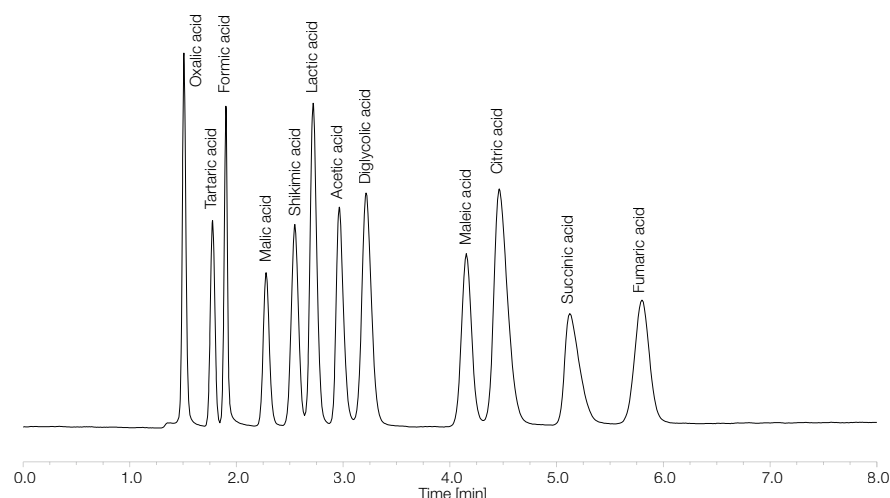
### Technical data

- pH stability: 2 – 8
- particle size: 5 µm
- pore size: 110 Å
- specific surface: 340 m<sup>2</sup>/g

For more information visit our website:  
[www.mn-net.com/chromatography](http://www.mn-net.com/chromatography)

### For more information

please check out our application note



Chromatogram of 12 organic acids from a standard mixture on NUCLEODUR® C18 OA 150 x 4.6 mm column.

### Chromatographic results from standard mixture

Peak number	Peak Name	Retention time [min]	Concentration [mg/mL]	Calibration range [g/L]	Correlation R <sup>2</sup>
1	Oxalic acid	1.51	0.36	0.01 - 1.00	0.9995
2	Tartaric acid	1.78	1.51	0.10 - 10.00	1.0000
3	Formic acid	1.90	2.90	0.10 - 10.00	1.0000
4	Malic acid	2.28	3.07	0.10 - 10.00	1.0000
5	Shikimic acid	2.55	0.068	0.01 - 1.00	1.0000
6	Lactic acid	2.72	12.61	0.50 – 25.00	0.9999
7	Acetic acid	2.96	7.69	0.50 – 25.00	0.9998
8	Diglycolic acid	3.22	7.67	0.50 – 25.00	1.0000
9	Maleic acid	4.16	0.040	0.01 - 1.00	0.9999
10	Citric acid	4.46	8.28	0.50 – 25.00	1.0000
11	Succinic acid	5.13	7.64	0.50 – 25.00	0.9999
12	Fumaric acid	5.80	0.037	0.01 - 1.00	0.9998

## HPLC analysis of organic acids from various fruit juices

### Good to know

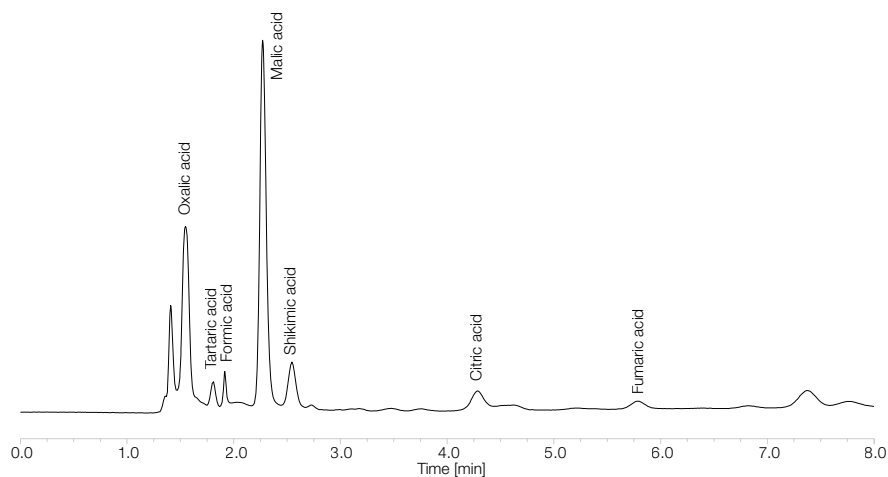


Sample pretreatment:

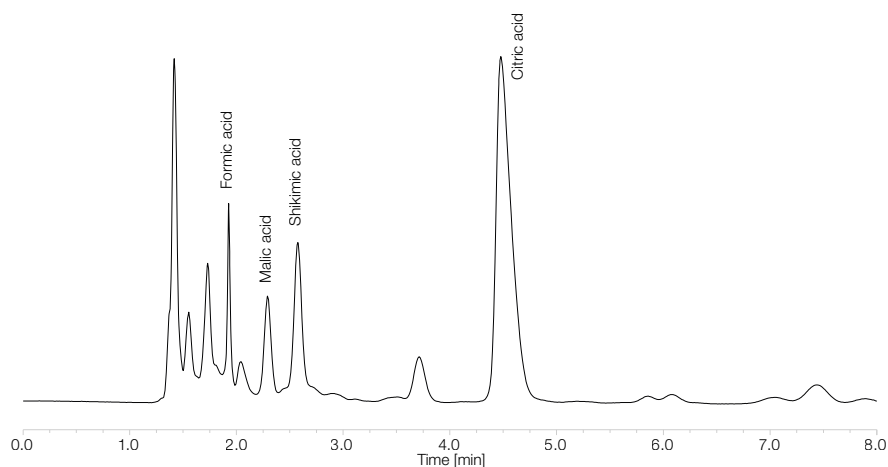
Dilute sample 1 : 5 with eluent A,  
Centrifuge for 5 min at 4500 rpm.

Filtrate upper layer through a syringe filter  
Chromafil® Xtra PET, 25 mm, 0.45 µm (REF  
729220) into a HPLC vial.

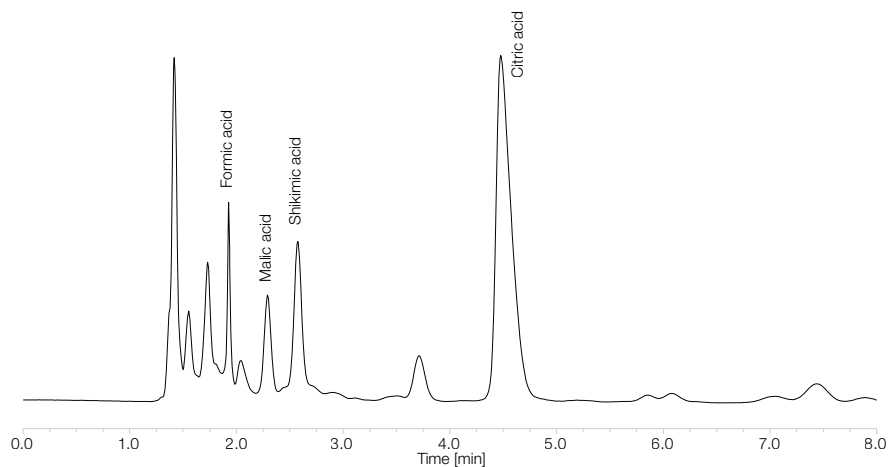
Sample is ready for injection.



Chromatogram of organic acids from apple juice on NUCLEODUR® C18 OA 150 x 4.6 mm column (chromatographic conditions s. page 2).



Chromatogram of organic acids from orange juice on NUCLEODUR® C18 OA 150 x 4.6 mm column (chromatographic conditions s. page 2).



Chromatogram of organic acids from grape juice on NUCLEODUR® C18 OA 150 x 4.6 mm column (chromatographic conditions s. page 2).



# NUCLEODUR® C18 OA

## Chromatographic results from fruit juices

Peak Name	Amount in apple juice [mg/mL]	Amount in orange juice [mg/mL]	Amount in grape juice [mg/mL]
Oxalic acid	0.36	n. d.	0.64
Tartaric acid	0.19	n. d.	5.01
Formic acid	0.33	2.60	1.15
Malic acid	8.95	2.88	6.06
Shikimic acid	0.016	0.078	0.014
Lactic acid	n. d.*	n. d.	n. d.
Acetic acid	n. d.	n. d.	n. d.
Diglycolic acid	n. d.	n. d.	n. d.
Maleic acid	n. d.	n. d.	n. d.
Citric acid	0.59	17.24	0.98
Succinic acid	n. d.	n. d.	n. d.
Fumaric acid	0.0002	n. d.	0.032

\* n. d. = not detected.

## Ordering information

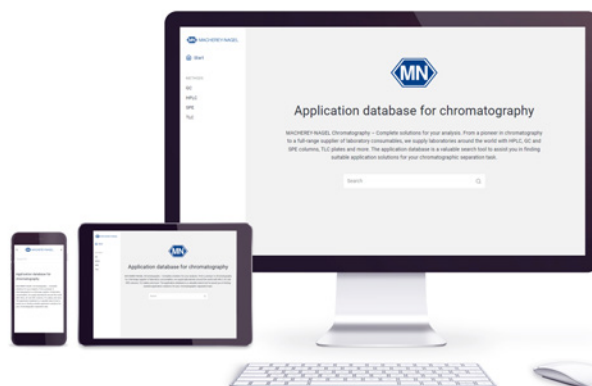
Product description HPLC columns	Article number / REF	Pack of	Product information
EC 150/4.6 NUCLEODUR® C18 OA, 5 µm	760688.46	1 column	
EC 250/4.6 NUCLEODUR® C18 OA, 5 µm	760689.46	1 column	



NUCLEODUR® C18 OA analytical HPLC column

## The chromatography application database

- Free access to more than 3,000 application examples from HPLC, GC, TLC and SPE
- Free access to the MN application database:  
<https://chromaappdb.mn-net.com>



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