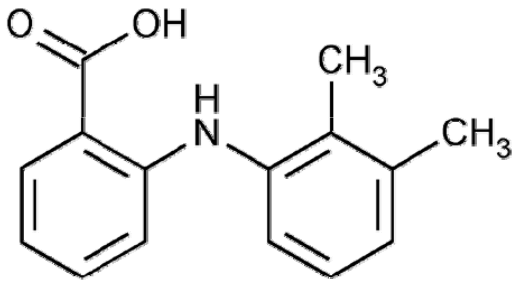
Mefenamic Acid

USP Method Mefenamic Acid RS
USP Method Mefenamic Acid Assay



Original Manufacturer: Shionogi Inc (Patent expired)

Brand Name: Mefalth, Mefalth T, Ponstel, Ponstan, Ponstal, Parkemed, Mafepain, Mefamed, Mephadolor, Meftal, Dyfenamic, Potarlon, Dolfenal, Meyerdonal, Alfoxan, Fenagesic, Spiralgin.

Mefenamic acid is a non-steroidal anti-inflammatory drug used to treat pain, including menstrual pain. Mefenamic acid decreases inflammation (swelling) and uterine contractions .

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www.merck-chemicals.com/chromatography
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Mefenamic Acid

USP34 – NF29 S1

USP Columns:

ZORBAX ODS Assay and Chromatographic purity

Equivalent Column:

Purospher®STAR RP-18 endcapped (5 µm) 250x4.6 mm (1.51456.0001)

Recommended Solvents and Reagents:

Acetonitrile isocratic grade for liquid chromatography LiChrosolv® (1.14291)

Tetrahydrofuran for liquid chromatography LiChrosolv® (1.08101)

Water Water for chromatography LiChrosolv® (1.15333)
or freshly purified water from Milli-Q water purification system

Ammonium phosphate (mono basic) Use ACS Reagent grade

Ammonium Hydroxide Use ACS Reagent grade

USP Standards

Mefenamic Acid (200 mg) USP Product Number: 1379605

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USP Method for Mefenamic Acid

Buffer solution
Prepare a 50 mM solution of monobasic ammonium phosphate, and adjust with 3 M ammonium hydroxide to a pH of 5.0.

Mobile phase
Prepare a filtered and degassed mixture of acetonitrile, Buffer solution, and tetrahydrofuran (23:20:7). Make adjustments if necessary (*see System Suitability under Chromatography 621*).

Standard preparation
Dissolve an accurately weighed quantity of USP Mefenamic Acid RS in Mobile phase, and dilute quantitatively, and stepwise if necessary, with Mobile phase to obtain a solution having a known concentration of about 0.2 mg per mL.

Assay preparation
Transfer about 100 mg of Mefenamic Acid, accurately weighed, to a 500-mL volumetric flask, dissolve in and dilute with Mobile phase to volume, and mix.

Chromatographic system (*see Chromatography 621*)
The liquid chromatograph is equipped with a 254-nm detector and a 4.6-mm × 25-cm column that contains packing L1. The flow rate is about 1 mL per minute. Chromatograph the Standard preparation, and record the peak responses as directed for Procedure:

Column efficiency is not less than 8200 theoretical plates;
Tailing factor for the analyte peak is not more than 1.6;
Relative standard deviation for replicate injections is not more than 1.0%.

Procedure:
Separately inject equal volumes (about 10 µL) of the Standard preparation and the Assay preparation into the chromatograph, record the chromatograms, and measure the responses for the major peaks. Calculate the quantity, in mg, of $C_{15}H_{15}NO_2$ in the portion of Mefenamic Acid taken by the formula:

$500C(r_U/r_S)$ C = concentration in mg/mL, of USP Mefenamic Acid RS in the Standard preparation
r_U and r_S are the Mefenamic acid peak responses obtained from the Assay preparation and the Standard preparation, respectively.

USP Method for Mefenamic Acid RS

Chromatographic purity
Buffer solution, Mobile phase, and Chromatographic system—Proceed as directed in the Assay.

Standard solution
Dissolve an accurately weighed quantity of USP Mefenamic Acid RS in Mobile phase to obtain a solution having a known concentration of about 10 µg per mL.

Test solution
Transfer about 100 mg of Mefenamic Acid, accurately weighed, to a 100-mL volumetric flask, dissolve in and dilute with Mobile phase to volume, and mix.

Procedure
Separately inject equal volumes (about 10 µL) of the Standard solution and the Test solution into the chromatograph, record the chromatograms, and measure the responses for the major peaks.
Calculate the percentage of each impurity in the portion of Mefenamic Acid taken by the formula:

$100(C_S/C_U)(r_i/r_S)$

C_S = conc. in µg/mL, of USP Mefenamic Acid RS in Standard solution
C_U = conc. in µg/mL, of Mefenamic Acid in the Test solution
ri = the peak response for each impurity obtained from the Test solution
rS =the peak response for Mefenamic acid from Standard solution

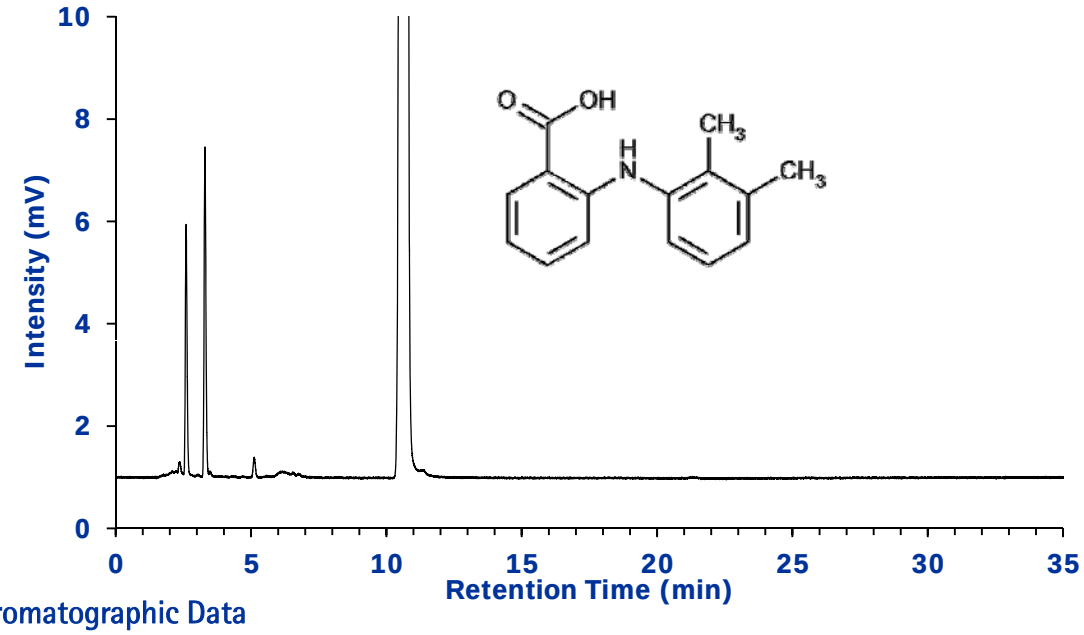
Not more than (NMT) 0.1% of any individual impurity is found; and NMT 0.5% of total impurities is found.

USP Method for Mefenamic Acid RS

Purospher®STAR RP-18endcapped

Chromatographic Conditions

Column:	Purospher®STAR RP-18endcapped (5 µm) 250x4.6 mm	1.51456.0001
Injection:	10 µL	
Detection:	Shimadzu Prominence, UV 254 nm	
Cell:	10 µL	
Flow Rate:	1.0 mL/min	
Mobile Phase (v/v):	Buffer: 50 mM of monobasic ammonium phosphate, adjusted with 3 M ammonium hydroxide to a pH of 5.0. Mix tetrahydrofuran, buffer and acetonitrile (14:40:46)	
Temperature:	25°C	
Diluent	Mobile phase	
Sample:	5 ppm of Impurity C and D, 0.1 ppm of Impurity A and 100 ppm Mefenamic Acid	
Pressure Drop:	140 Bar (2030 psi)	



Chromatographic Data

No	Compound	Time (min)	Relative Retention Time (RRT)	Asymmetry (T_{USP})	Plates (N)
1	Impurity C	2.6	0.24	1.2	7697
2	Impurity D	3.3	0.31	1.2	11439
3	Impurity A	5.1	0.48	1.1	19510
4	**Mefenamic acid**	**10.7**	**1.00**	**0.9**	**18758**

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