

N-METHYLACETAMIDE AND N-METHYLFORMAMIDE IN URINE BY GC/MS

REF GC99010

This product fulfills all the requirements of Directive 98/79/EC on in vitro diagnostic medical devices (IVD). The declaration of conformity is available upon request.



INSTRUCTIONS FOR USE

IVD

For *in vitro* diagnostic use

CE



EUREKA S.R.L. LAB DIVISION
Via M. D'Antona 28
60033 Chiaravalle (AN) - Italy
Tel +39 071 7450790
eureka-support@sentinel.it
www.eurekakit.com



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INTENDED USE

In vitro diagnostic medical device for the detection and the quantitative analysis of N-Methylacetamide and N-Methylformamide in urine as aid in the diagnosis of occupational diseases. Manual method for professional use.

KIT CONTENT FOR 100 TESTS

CONTENT	DESCRIPTION	PACKAGING	WARNING
Reagent A	Extraction Solution	3 x 10 ml	Store at T ranging between +15 °C at +25 °C
Reagent B	Test Solution	1 x 1 ml	Store at T ranging between -25 °C at -15 °C
Reagent C	Internal Standard Solution	1 x 2 ml	Store at T ranging between -25 °C at -15 °C
Reagent D	Coadjuvant Solution	1 x 100 ml	Store at T ranging between +15 °C at +25 °C
Multiparametric Calibrator		6 x 10 ml/5 x 1 x 300 µl	(packed separately – Code GC99016 – see data sheet)

ACCESSORIES AND CONSUMABLES AVAILABLE SEPARATELY

CODE	DESCRIPTION	PACKAGING
GC99016	Calibrator for N-Methylacetamide and N-Methylformamide in urine	6 x 10 ml/5 x 1 x 300 µl
GC99019	Control for N-Methylacetamide and N-Methylformamide in urine – Levels 1 and 2	2 x 10 ml/2 x 1 x 300 µl
STH260X296P	TR WAX MS (30 m x 0,25 mm – 1 µm) Analytical Column [or similars]	1 Pc
S29057U	Glass Standard Vials of 2 ml with caps	1 x 100 Pcs
S24717	Insert for vials of 2 ml	1 x 100 Pcs
Z1636/26	Pyrex of 10 ml with SWL caps	1 x 40 Pcs

INSTRUMENTS

DESCRIPTION	WARNING
GC/MS Instrument	Required
Operational Computer	Required
Autosampler	Required

MATRIX - COLLECTION AND STORAGE PROCEDURE

MATRIX	PROCEDURE
Urine	At the end of the work shift, collect 10 ml of urine in a hermetically sealed glass tube (aluminum ferrules and Teflon caps). The transfer of the sample into the container should be done as soon as possible. The sample is stable for about 7 days at 2-8 °C.

BIOLOGICAL LIMIT VALUES (BLVs)

ANALYTES	VALUE (mg/l)
N-Methylacetamide	n.a.
N-Methylformamide	n.a.

PREANALYTICAL PROCEDURE

Dispense into a suitable vial:

- 900 µl of **Reagent A**
- 100 µl of **Reagent B**

Inject 2 µl into GC/MS as per instrumental specifications to identify retention times of different analytes.

ANALYTICAL PROCEDURE

STEP	DESCRIPTION
ANALYTICAL PROCEDURE STEP 1	Dispense into Pyrex tubes: • 2 ml of urine • 250 µl of <u>Reagent A</u> • 20 µl of <u>Reagent C</u> <i>Vortex for 1 minute</i>
STEP 2	Add 1 ml of <u>Reagent D</u> and shake by inversion. Centrifuge at 4000 rpm for 2 minutes. Take the lower phase and dispense into suitable vials.
Injection	Inject 2 µl into the GC system or into instruments with equivalent parameters.

MASSA DETECTOR SETTING

MS acquisition in SIM (except for the test solution for which we will operate in full-scan)

SIM parameters.

Set SIM to obtain the following quantifier ions (T) and qualifiers (R) while respecting the retention times (CAUTION: RETENTION TIMES MAY VARY FROM SYSTEM TO SYSTEM! INJECT ONE TEST SOLUTION!)

Target (T) and reference (R) ions for quantification

ANALYTES	T	R	RT (min)
IS	73	/	7.00
N-Methylacetamide	73	43	8.97
N-Methylformamide	59	30	9.08

PROGRAMMED THERMAL SETTING

TEMPERATURE PROGRAM

TEMPERATURE	TIME
40°C	0 min
Increase of 20°C/min	Up to 250°C for 3 min

TEMPERATURES AND OPERATING FLOWS

PARAMETERS	SETTINGS
Injector	T=250°C
Split ratio	1:2
Transferline	T=250°C
Helium flow	See temperature program

TECHNICAL FEATURES - PART I

ABBREVIATIONS	MEANING
C LLOQ	Concentration at low limit of quantification
C1	Low concentration
C2	Medium concentration
C3	High concentration

ANALYTES	CONCENTRATIONS USED TO CALCULATE REPRODUCIBILITY AND ACCURACY (mg/l)			
	C LLOQ	C1	C2	C3
N-Methylacetamide	1	5	30	75
N-Methylformamide	1	5	30	75

ANALYTES	ACCURACY INTRA SERIE (RELATIVE ERROR %)			
	CLLOQ (%)	C1 (%)	C2 (%)	C3 (%)
N-Methylacetamide	6,99	7,67	2,66	1,49
N-Methylformamide	9,53	7,42	4,59	3,69

ANALYTES	ACCURACY INTER SERIE (RELATIVE ERROR %)			
	CLLOQ (%)	C1 (%)	C2 (%)	C3 (%)
N-Methylacetamide	13,36	10,33	2,91	3,13
N-Methylformamide	15,68	9,80	8,08	4,55

TECHNICAL FEATURES - PART II

ANALYTES	REPRODUCIBILITY INTRA SERIE (COEFFICIENT OF VARIATION %)			
	CLLOQ (%)	C1 (%)	C2 (%)	C3 (%)
N-Methylacetamide	3,15	2,07	1,93	1,73
N-Methylformamide	7,46	3,38	1,07	1,42

ANALYTES	REPRODUCIBILITY INTER SERIE (COEFFICIENT OF VARIATION %)			
	CLLOQ (%)	C1 (%)	C2 (%)	C3 (%)
N-Methylacetamide	6,70	7,42	5,53	6,03
N-Methylformamide	7,70	4,66	6,12	4,33

TECHNICAL FEATURES - PART III

ANALYTES	LLOD (mg/l)	LINEARITY (mg/l)	COEFFICIENT OF CORRELATION R2 + STD DEV
N-Methylacetamide	0,33	1 - 1000	0,9990 ± 0,0004
N-Methylformamide	0,33	1 - 1000	0,9987 ± 0,0010

ANALYTES	RECOVERY (%)	MATRIX EFFECT (%)	CARRY OVER (%)	LOT VARIABILITY (%)
N-Methylacetamide	107,4	106,8	0,32	14,30
N-Methylformamide	91,3	109,4	1,88	14,81

REFERENCE CHROMATOGRAMS

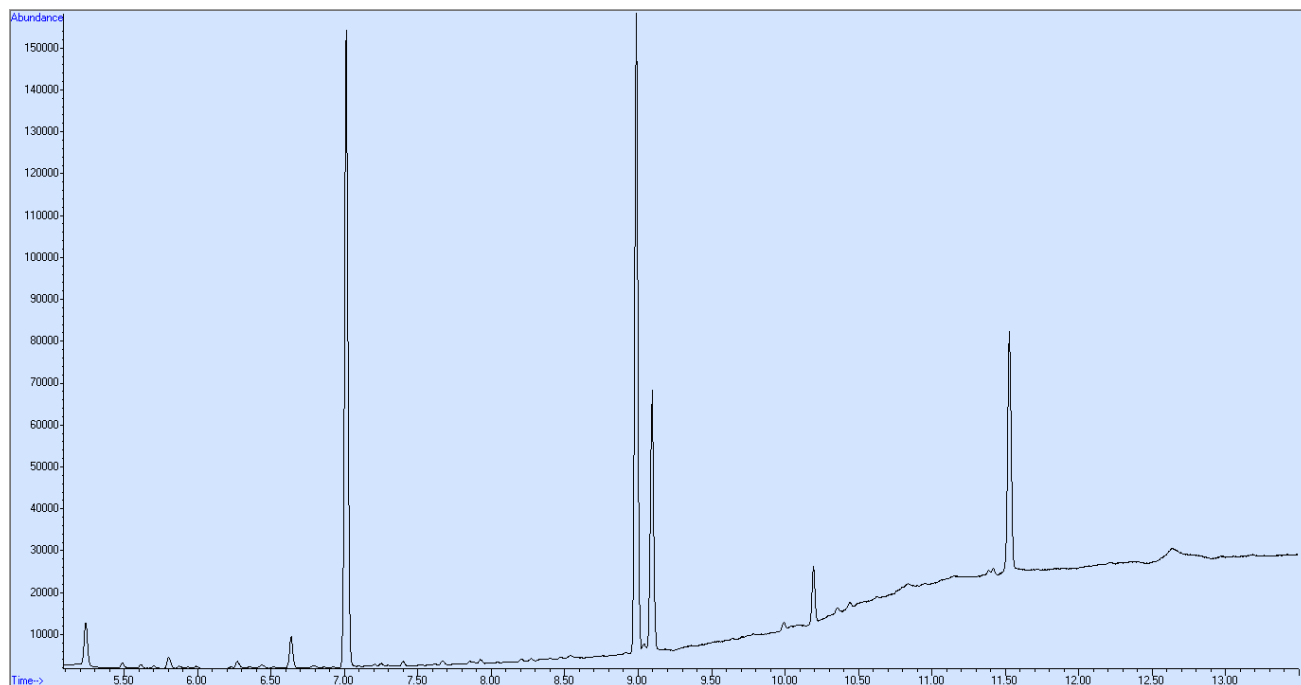


Fig. 1 Calibrator

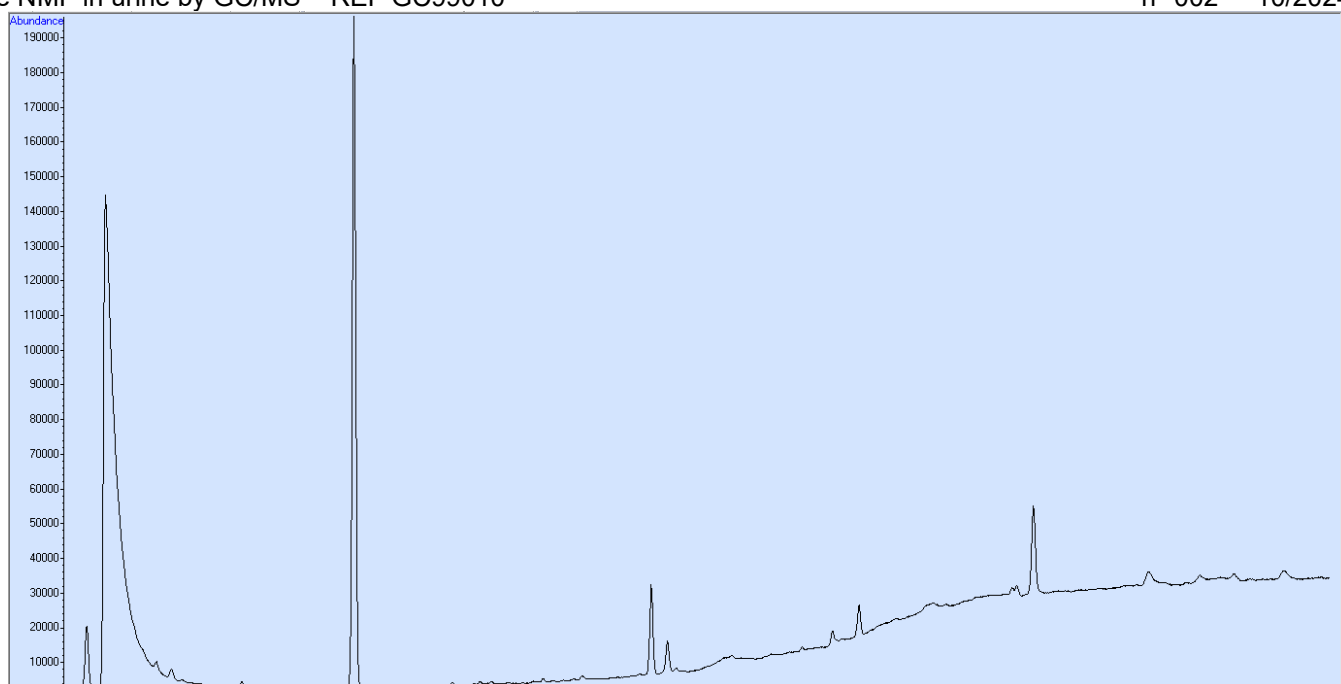


Fig. 2 Control

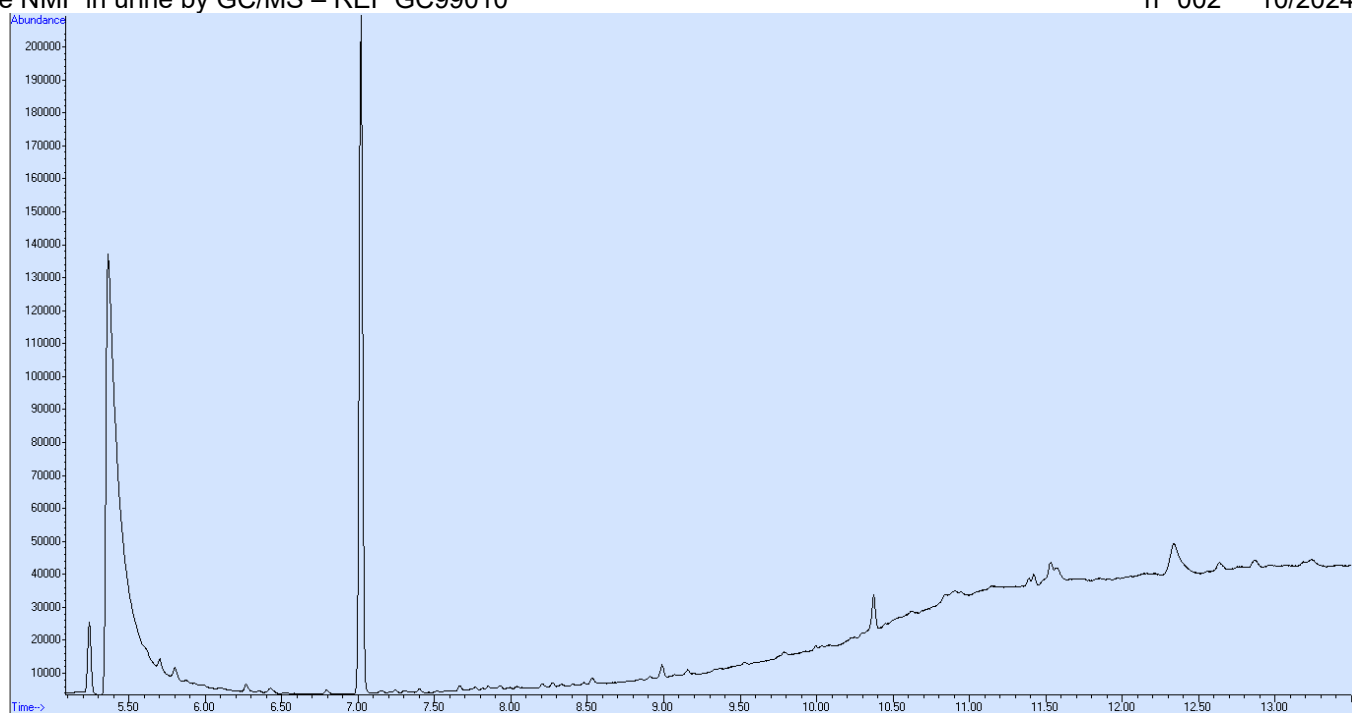


Fig.3 Sample

GENERAL WARNINGS

1. STORAGE AND SHELF LIFE

All the components are ready-to-use. Stable for 3 years at 15-25°C except Reagent B (Test Solution) and Reagent C (Internal Standard Solution) that must be stored at a T ranging between -25°C and -15°C.

REAGENT	COMPOSITION	CONCENTRATIONS (mg/l)
Reagent B	IS N-Methylacetamide N-Methylformamide	1000

2. NEW COLUMN TREATMENT

Install the new TR WAX MS (30 m x 0,25 mm – 1 µm) Analytical Column.
Cut ends with appropriate column cutter.

3. INJECTION NEEDLE WASHING

Hexane.

ABBREVIATIONS

ABBREVIATIONS	MEANING
es. 5 x 1 x 1 ml	N° of levels x N° of vials x volume
NMA	N-Methylacetamide
NMF	N-Methylformamide
DEV STD	Deviazione standard
LLOD	Low limit of detection
Pc/pcs	Piece/pieces
rpm	revolutions per minute
RT	Retention Time
n.a.	Not available
IS	Internal Standard

BIBLIOGRAPHY

1. N-Methylformamide and N-methylacetamide in urine, The MAK Collection for Occupational Health and Safety 2016, Vol 1, No 1
2. The role of biomarkers in chemicals management, Paul T.J. Scheepers, Trends in Analytical Chemistry, Vol. 30, No. 3, 2011
3. S-(acetamidomethyl)mercapturic acid (AMMA): A new biomarker for occupational exposure to N,N-dimethylacetamide, Andrea Princivalle, Francesco Pasini, Luigi Perbellini, Journal of Chromatography B, 878 (2010) 2515–2519

REFERENCE STANDARDS

Quality Assurance System compliant with regulations:

UNI CEI EN ISO 13485:2016,
UNI EN ISO 9001:2015

Any modification made to the Medical Device unless authorized by Eureka S.r.l. - Lab Division makes this declaration invalid.

We declare that the devices comply with the following **Technical Standards**:

UNI CEI EN ISO 14971:2012
UNI CEI EN ISO 15223-1:2017
UNI EN ISO 18113-2:2012

We declare that the device is sold in a non-sterile package.

IVD SIMBOLS

NUMBER	SYMBOL	DESCRIPTION
1		Manufacturer
2		Product Model Number / Designation or Part Number
3		Caution, consult accompanying documents
4		Product Lot Number
5		Use By (Expiry)
6		Consult Operating Instructions
7		Date of manufacture
8		Temperature limitation
9		For <i>in vitro</i> diagnostic use
10		European Union conformity
11		Packaging