

# Certificate of Analysis

## Ethyl formate

**PurCert Standard for GC**  
(Secondary reference standard)

<b>Product Number</b>	PSR28314	<b>CAS No.</b>	109-94-4
<b>Brand</b>	PureSynth	<b>Lot No.</b>	MPM02SR
<b>Molecular Formula</b>	C <sub>3</sub> H <sub>6</sub> O <sub>2</sub>	<b>Date of Mfg.</b>	Feb.2023
<b>Molecular Weight</b>	74.08 g/mol	<b>Date of Exp.</b>	Jan.2027

Test	Specification	Result
Description	Colorless liquid	Colorless liquid
Assay (GC-FID)	> 98.0 %	98.50 %
Water (By KF)	NMT 0.2000 %	0.1366 %
Identification by <sup>1</sup> H NMR	Conforms to structure	Conforms
Identification by GC-MS	Conforms to molecular mass	Conforms
Identification by IR	Conforms to structure	Conforms

**\*Traceable to USP Reference Standard 1265606, Lot no: R101A0\***

**Storage Condition:** Store at room temperature and keep the container tightly closed.

**Remark:** The batch complies with the prescribed quality of the above specification.

*This is a computer-generated report -does not required sign*

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## Assay by GC-FID

### METHOD: GC- FID conditions:

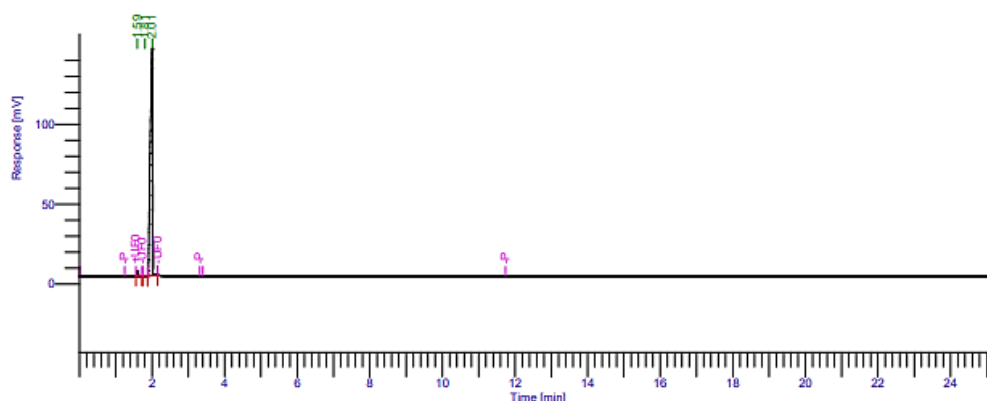
**Column:** Agilent Technologies DB-FFAP 30mx 0.530mm, 1.0micron

**Instrument:** PerkinElmer, GC 2014,

**Detector:** FID, **Carrier gas:** Nitrogen

**Temp programming:** Initial 50°C hold for 1min, 5° C Ramp/ min., 100 °C hold for 1 min., 25°C Ramp up to 250°C hold for 2 min., Run time 20 min.

Software Version	: 6.3.4.0700	Date	: 15/05/2023 3.39.16 PM
Operator	: manager	Sample Name	: AR23000264-ETHYLFORMATE- MP
Sample Number	: 1		M02SR
AutoSampler	: BUILT-IN	Study	: GC Purity
Instrument Name	: Clarus 680	Rack/Vial	: 0/31
Instrument Serial #	: None	Channel	: A
Delay Time	: 0.00 min	A/D mV Range	: 1000
Sampling Rate	: 12.5000 pts/s	End Time	: 25.27 min
Sample Volume	: 1.000000 ul		
Sample Amount	: 1.0000		
Data Acquisition Time	: 15/05/2023 2.25.35 PM	Area Reject	: 0.000000
		Dilution Factor	: 1.00
		Cycle	: 1



## GC Reports

15/05/2023 3.39.16 PM Result:

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]
1		1.593	8439.10	3016.84	1.34
2		1.805	1025.36	248.28	0.16
3		2.005	621706.75	143831.75	98.50
			631171.21	147096.87	100.00

### Missing Component Report

Component Expected Retention (Calibration File)

All components were found

**Purity by GC-FID: 98.50 %**

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## IDENTIFICATION TESTS

### GC-MS Spectrum:

#### METHOD: GC-MS conditions:

**Column:** Agilent Technologies, Elite -5MS, 30 m X 0.25 mm, 1.0micron

**Instrument:** Perkin Elmer, **Carrier gas:** Helium

**Source Temp.:** 230°C, Transfer line: 250°C

**Inlet Temp.:** 180°C, **Diluent:** Methanol

**Source energy:** 70eV

#### Mass by GC-MS:

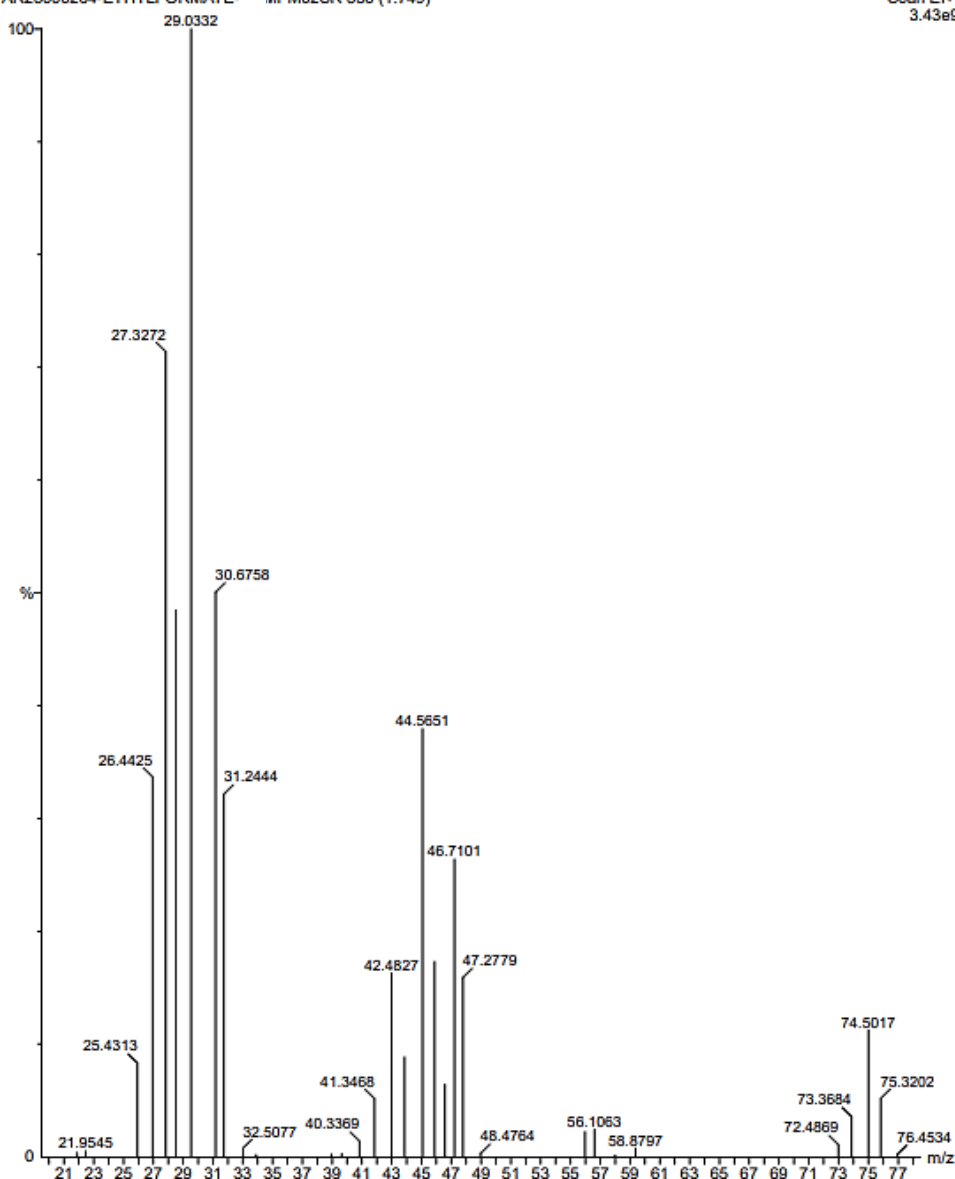
**Product Name:** Ethyl formate

**Product Code:** PSR28314

, 15-May-2023 + 11:40:13

AR23000264-ETHYLFORMATE- MPM02SR 350 (1.749)

Scan EI+  
3.43e9



Identification by GC-MS: Conforms to molecular mass

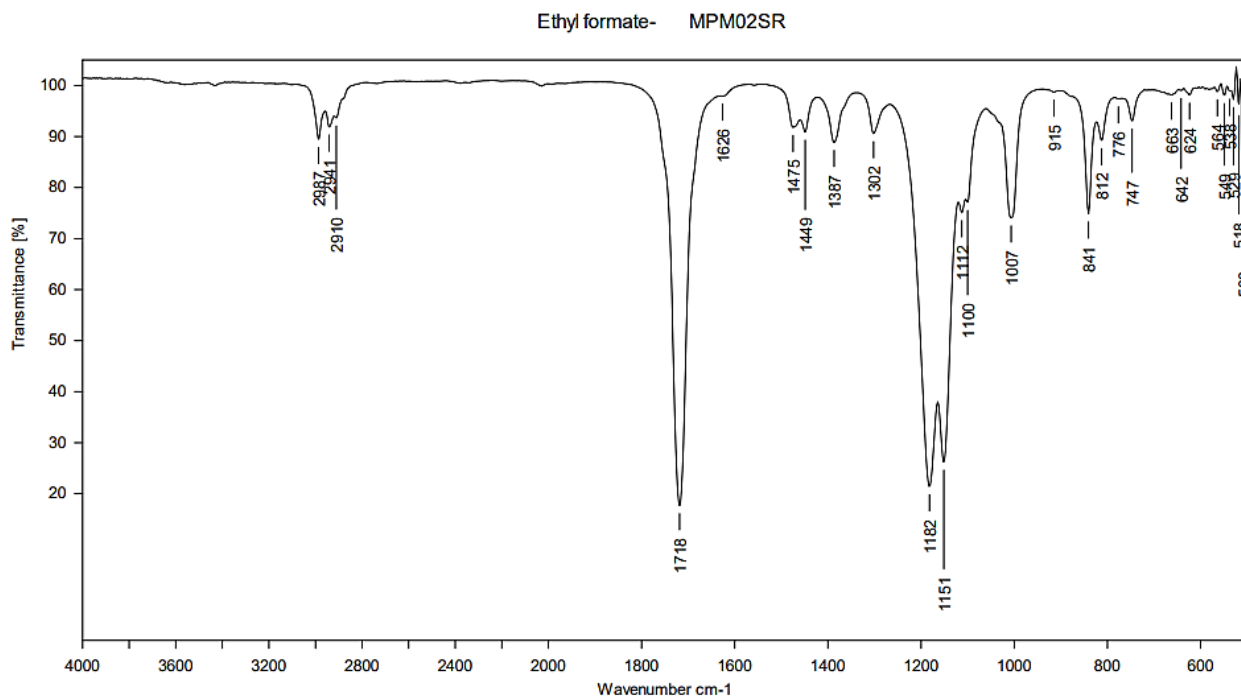
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**Infrared spectrum:**

**Product Name:** Ethyl formate

**Product Code:** PSR28314



Experiment ATR\_ZnSe1.XPM

Operator Name Admin

Instrument Type Alpha II

Resolution 4

Path of File C:\PRL

Date of Measurement 18-05-2023

Sample Form Liquid

Sample Scans 32

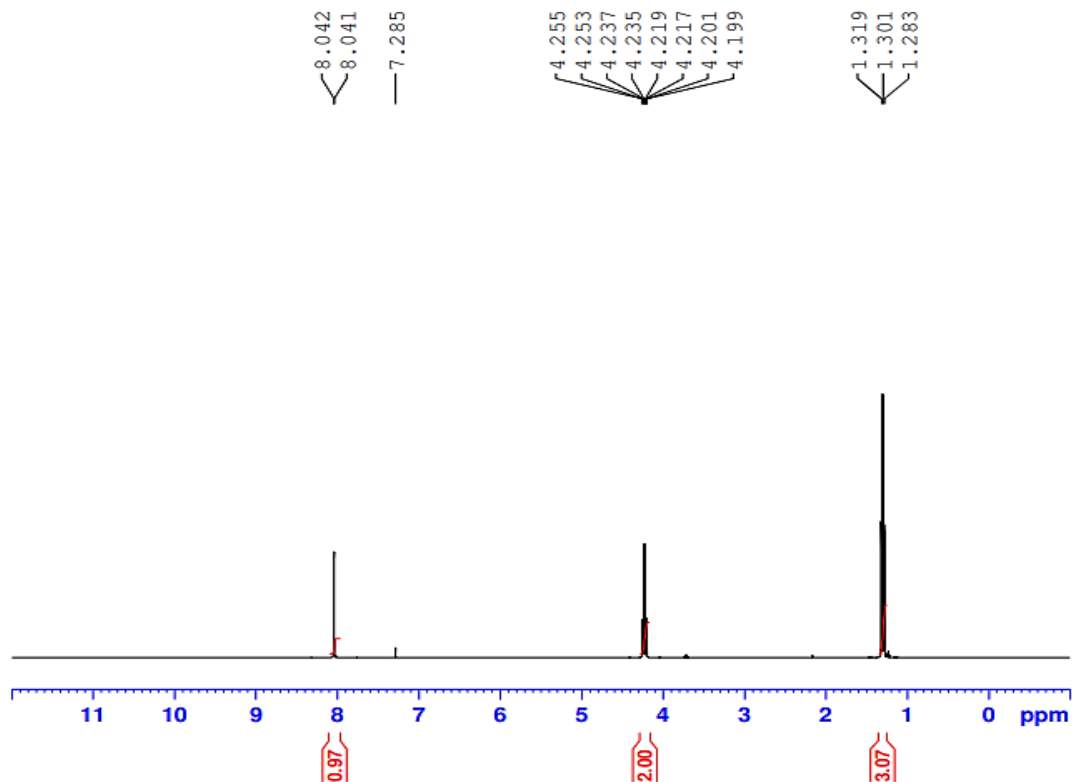
**Identification by IR: Conforms to structure**

### **<sup>1</sup>H NMR Spectrum:**

Product Name: Ethyl formate

Product Code: PSR28314

Ethyl formate  
1H NMR in CDCl<sub>3</sub>



Identification by <sup>1</sup>H NMR: Conforms to structure

### **Maximum limits of impurities**

#### **WATER DETERMINATION**

Method: Karl Fisher titration

Water Content (PSR28314) = **0.1366 %**

Approved By  
Head - Technical

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