

## Overview

### Useful For

Detection and quantitation of acetone, methanol, isopropanol, and ethanol in whole blood

Quantification of the concentration of ethanol in blood that correlates with the degree of intoxication

Evaluation of toxicity to the measured volatile substances

### Not intended for use in employment-related testing.

Providing chain-of-custody for when the results of testing could be used in a court of law. Its purpose is to protect the rights of the individual contributing the specimen by demonstrating that it was under the control of personnel involved with testing the specimen at all times; this control implies that the opportunity for specimen tampering would be limited.

### Additional Tests

Test ID	Reporting Name	Available Separately	Always Performed
COCH	Chain of Custody Processing	No	Yes

### Testing Algorithm

This test includes analysis of methanol, ethanol, isopropanol, and acetone.

### Method Name

Headspace Gas Chromatography-Flame Ionization Detector (HSGC-FID)

### NY State Available

No

## Specimen

### Specimen Type

Whole blood

### Specimen Required

**Supplies:** Chain-of-Custody Kit (T282)

**Container/Tube:** Chain-of-Custody Kit containing the specimen container seals and documentation required.

**Preferred:** Grey top (potassium oxalate/sodium fluoride)

**Acceptable:** Any anticoagulant

**Specimen Volume:** 1 mL

**Collection Instructions:**

- Do not use alcohol to clean arm.** Use alternative such as Betadine to cleanse arm before collecting any specimen for volatile testing.
- Specimen must be sent in original tube. Collect specimen, seal, and submit with the associated documentation to satisfy the legal requirements for chain of custody testing.

**Forms**

[Chain-of-Custody Request](#) is included in the Chain-of-Custody Kit (T282).

**Specimen Minimum Volume**

0.5 mL or amount to fill 1 tube

**Reject Due To**

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	OK

**Specimen Stability Information**

Specimen Type	Temperature	Time	Special Container
Whole blood	Refrigerated (preferred)	14 days	
	Frozen	28 days	
	Ambient	24 hours	

**Clinical and Interpretive**
**Clinical Information**

Volatile substances in the blood include ethanol, methanol, isopropanol, and acetone. Acetone is generally elevated in metabolic conditions such as diabetic ketoacidosis. Methanol and isopropanol are highly toxic and result from exogenous ingestion.

Ethanol is the single most important substance of abuse in the United States. It is the active agent in beer, wine, vodka, whiskey, rum, and other liquors. Ethanol acts on cerebral function as a depressant similar to general anesthetics. This depression causes most of the typical symptoms such as impaired thought, clouded judgment, and changed behavior. As the level of alcohol increases, the degree of impairment progressively increases.

In most jurisdictions in the United States, the per se blood level for being under the influence of alcohol (ethanol) for purposes of driving a motor vehicle is 80 mg/dL.

Chain of custody is required whenever the results of testing could be used in a court of law. Chain of custody is a record of the disposition of a specimen to document the individuals that collected it, handled it, and performed the analysis. When a specimen is submitted in this manner, analysis will be performed in such a way that it will withstand regular court scrutiny.

**Reference Values****METHANOL**

Not detected (Positive results are quantitated.)

Toxic concentration: > or =10 mg/dL

**ETHANOL**

Not detected (Positive results are quantitated.)

Toxic concentration: > or =400 mg/dL

**ISOPROPANOL**

Not detected (Positive results are quantitated.)

Toxic concentration: > or =10 mg/dL

**ACETONE**

Not detected (Positive results are quantitated.)

Toxic concentration: > or =10 mg/dL

**Interpretation****Methanol:**

The presence of methanol indicates exposure which may result in intoxication, central nervous system (CNS) depression, and metabolic acidosis. Ingestion of methanol can be fatal if patients do not receive immediate medical treatment.

**Ethanol:**

The presence of ethanol indicates exposure which may result in intoxication, CNS depression, and metabolic acidosis.

**Isopropanol:**

The presence of isopropanol indicates exposure which may result in intoxication and CNS depression. Ingestion of isopropanol can be fatal if patients do not receive immediate medical treatment.

**Acetone:**

The presence of acetone may indicate exposure to acetone; it is also a metabolite of isopropanol and may be detected during ketoacidosis.

**Cautions**

This test does not detect ethylene glycol.

**Clinical Reference**

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1. Langman LJ, Bechtel LK, Meier BM, Holstege C: Chapter 41: Clinical Toxicology. In: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Edited by N Rifai, AR Horvath, CT Wittwer. Sixth edition. Elsevier; 2018. pp. 832-87
2. Mihic SJ, Koob GF, Mayfield J, Harris RA: Ethanol. In: Goodman & Gilman's: The Pharmacological Basis of Therapeutics, 13th edition. Edited by LL Brunton, R Hilal-Dandan, BC Knollmann. McGraw-Hill Education; 2017
3. Olson KR, Anderson IB, Benowitz NL, et al: Specific Poisons and Drugs: Diagnosis and Treatment. In Poisoning and Drug Overdose, Seventh edition. McGraw-Hill Education; 2017

## Performance

## Method Description

Specimens are analyzed and quantified by headspace gas chromatography- flame ionization detection.(Baselt RC. Disposition of Toxic Drugs and Chemicals in Man, 10th edition, Biomedical Publications; 2014. pp 2211)

## PDF Report

No

## Day(s) Performed

Monday through Friday

## Report Available

Same day/1 day

## Performing Laboratory Location

Rochester

## Fees and Codes

### Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact [Customer Service](#).

### Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

### CPT Code Information

80320

G0480 (if appropriate)

### LOINC® Information

Test ID	Test Order Name	Order LOINC Value
VLTBX	Volatile Screen, CoC, B	41266-8



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Result ID	Test Result Name	Result LOINC Value
36241	Volatile Scrn, B	41266-8
36242	Methanol, B	9334-4
36243	Ethanol, B	5640-8
36244	Acetone, B	9425-0
36245	Isopropanol, B	5667-1
36246	Chain of Custody	77202-0