MAYO CLINIC LABORATORIES

Test Definition: VLTB

Volatile Screen, Blood

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

This test is **not intended for use** in employment-related testing.

Testing Algorithm

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

Special Instructions

- Clinical Toxicology CPT Code Client Guidance

Method Name

Headspace Gas Chromatography Flame Ionization Detector (HSGC-FID)

NY State Available

Yes

Specimen

Specimen Type

Whole blood

Ordering Guidance

This test is not performed using chain of custody. For chain of custody testing, order VLTBX / Volatile Screen, Chain of Custody, Blood.

Additional Testing Requirements

If measurement of ethylene glycol is also needed, order ETGL / Ethylene Glycol, Serum.

Specimen Required

Container/Tube:

Preferred: Gray top (potassium oxalate/sodium fluoride)

Acceptable: Lavendar top (EDTA) or green top (sodium heparin)

Specimen Volume: 2 mL

Collection Instructions:

1. **Do not use alcohol to clean arm.** Use alternatives such as Betadine to cleanse arm before collecting any specimen for volatile testing.
2. Send whole blood specimen in original tube. **Do not aliquot.**

Forms
If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

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	
	Ambient	24 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information
Volatile substances in 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 one of the most widely abused legal substances 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 (0.08%).

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 that 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 that may result in intoxication, CNS depression, and metabolic acidosis.

Isopropanol:
The presence of isopropanol indicates exposure that 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

1. Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43
2. Mayfield J, Mihic SJ. Ethanol. In: Brunton LL, Knollmann BC, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. 13th ed. McGraw-Hill Education; 2022:chap 27
3. Olson KR, Anderson IB, Benowitz NL, et al. Specific Poisons and Drugs: Diagnosis and Treatment. In: Poisoning and Drug Overdose. 8th ed. McGraw-Hill; 2022:section II

Performance

Method Description

Samples are analyzed and quantified by headspace gas chromatography with flame ionization detection.(Langman LJ, Bechtel LK, Holstege CP. Clinical toxicology. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 43)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
2 to 3 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

Fees & 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 account representative. 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. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
G0480
80320 (if appropriate for select payers)
Clinical Toxicology CPT Code Client Guidance

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VLTB	Volatile Scrn, B	41266-8

Result ID	Test Result Name	Result LOINC® Value
89190	Volatile Scrn, B	41266-8
30921	Methanol, B	9334-4
30922	Ethanol, B	5640-8
30923	Acetone, B	9425-0
30924	Isopropanol, B	5667-1
34377	Chain of Custody	77202-0