PEth.

PHOSPHATIDYLETHANOL – CONCENTRATED LC-MS KIT.

TECAN

WHAT IS PETH?

Phosphatidylethanol (PEth) is an atypical phospholipid that can be found in the cell membrane of red blood cells. It is formed and incorporated into the cell membranes only in the presence of ethanol. Phospholipase D converts the phosphatidylcholine in red blood cells via a transphospatidylation reaction into PEth. This reaction is highly specific for the presence of ethanol in the bloodstream.

Up to 40 different PEth homologues occur naturally. Each has different abundancies and half-life times. Those molecules differ in the lengths and composition of the fatty chains. PEth 16:0/18:1 (also known as POPEth) and PEth 16:0/18:2 (PLPEth) are two of the most abundant homologues and are therefore predestined for quantification of PEth.

Advantages of PEth.

PEth reflects the direct and cumulative alcohol intake and is unaffected by recent short-term abstinence. The molecules are integrated into the cell membranes of red blood cells, where they remain stable over time. That stability offers a detection window of up to 4 weeks after the consumption of alcohol.

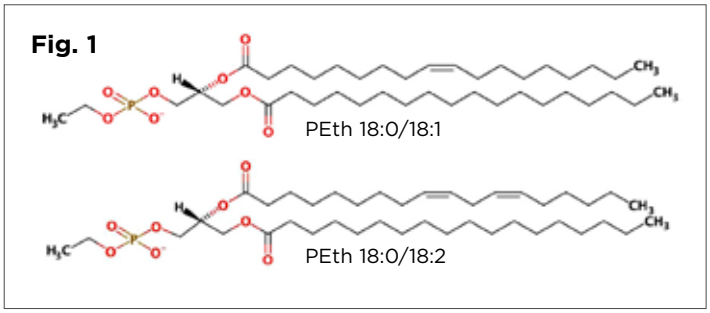


Fig. 1: Adapted from: Marisa Henriques Maria, Benedicte Marie Jørgenrud, Thomas Berg, Determination of eight phosphatidylethanol homologues in blood by reversed phase liquid chromatography–tandem mass spectrometry – How to avoid co-elution of phosphatidylethanols and unwanted phospholipids, Journal of Chromatography A, Volume 1684, 2022, 463566, ISSN 0021-9673, https://doi.org/10.1016/j.chroma.2022.463566.

PEth LC-MS measurement sample prep.

As phosphatidylethanol is incorporated in red blood cells, whole blood is used to determine the PEth concentration. Whole blood is a complex matrix that can be challenging to work with, requiring thorough sample preparation and clean-up to ensure a smooth and consistent LC-MS measurement. A deproteinization solution is used to remove unwanted blood components and proteins to reduce any interference. A sample clean-up will also help to prevent system clogging and will enhance the lifetime of the LCMS-column.

Calibrators and controls.

Using calibrators and controls is essential in every LCMS measurement. While calibrators define the signal-to-concentration relationship and establish traceability, controls provide a continuous performance check and monitor the total analytical process. Each Tecan Tec-Trace® Calibrator and Control is matrix-matched to compensate for matrix effects and will be shipped lyophilized to ensure product stability.

Internal Standard.

An internal standard (IS) is an isotopically labeled analogue of the target compound, in this case POPEth-D5 and PLPEth-D5. The internal standard normalizes each sample individually. During sample preparation, calibrators and controls will be spiked with this internal standard, too. This ensures reproducible results while monitoring deviations in the methods for each sample. The internal standard is already added to the deproteinisation solution, making sample preparation fast while reducing pitfalls in sample handling.

METHOD AND PRODUCTS.

Concentrated PEth Solutions.

Concentrated LC-MS kits are designed to simplify laboratory workflows by providing highly concentrated reagents. LC-MS methodology typically uses large volumes of potentially hazardous solvents in both the sample preparation and chromatography steps. Tecan offers a range of LC-MS kits in a "concentrated" format, with lower solvent volumes. All concentrated components, such as LC phases or sample preparation solutions, are diluted to the correct concentration in the lab.

Concentrated PEth LC-MS kits are specifically designed for laboratory professionals who value efficient and safe workflows. By using highly concentrated reagents, the required solvent volumes are prepared directly in the lab, minimizing exposure to hazardous substances. Clear reconstitution protocols ensure precise and reproducible results without adding complexity.

This approach significantly reduces the amount of solvent shipped and stored, leading to less packaging, lower waste, and easier logistics.

Ease of Use Quick and Simple Preparation.

The concentrated PEth LC-MS kit is designed for maximum convenience in the laboratory. Preparing working solutions is straightforward: simply add the provided concentrate to the recommended amount of standard LC-MS grade solvent from your usual supplier, mix, and you're ready to go.

Clear instructions ensure that every step is easy to follow, saving valuable time and minimizing the risk of errors. This user-friendly approach allows you to prepare all necessary reagents quickly and efficiently, supporting smooth laboratory workflows and reliable results—without unnecessary complexity.

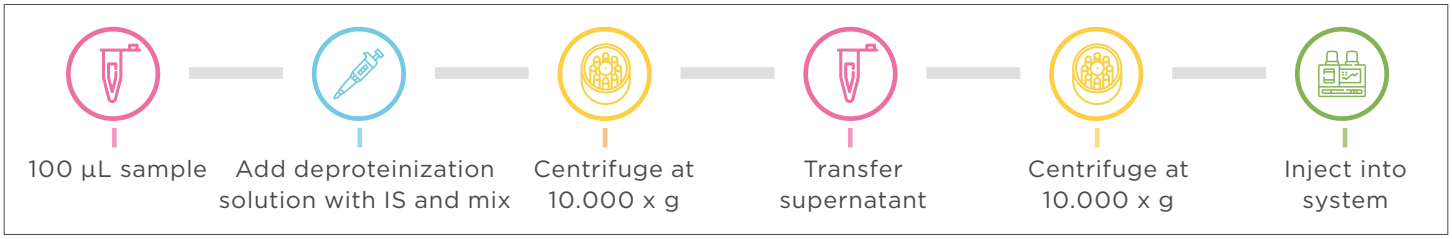
What's Included: Everything You Need for Reliable Results.

With the PEth LC-MS Starter Kit, you receive all essential components for both sample extraction and liquid chromatography, including concentrated mobile phases, deproteinization solution with internal standard, as well as a full set of calibrators and controls—everything you need for up to 200 assays. The Solvent Kit provides all required concentrated solvents for sample preparation and chromatography, including the deproteinization solution and mobile phases. If you already have calibrators and controls on hand, or require a different quantity, you have the flexibility to order only what you need.

All kit components are also available individually, so you can easily replenish specific items as needed. The LC column is always ordered separately, ensuring compatibility with your laboratory's existing setup.

Matrix	Whole blood
Analytes	PEth 16:0/18:1 (POPEth - 1-Palmitoyl-2-oleoyl-sn-glycero-3-phosphoethanol) PEth 16:0/18:2 (PLPEth - 1-Palmitoyl-2-linoleoyl-sn-glycero-3-phosphoethanol)
LC-MS runtime	5 Minutes
Injection	2 – 20 µL
Regulatory Status	Research use only

Sample Preparation.



KIT CONTENTS.

Kit solutions - for 200 assays	**Order number**	**Solvent Kit (30288760)**	**Starter Kit (30288761)**
Peth - Mobile Phase IA Concentrated	30288753	1 x 25 mL	1 x 25 mL
Peth - Mobile Phase IB Concentrated	30288756	1 x 25 mL	1 x 25 mL
Peth - Mobile Phase IIA Concentrated	30288757	1 x 25 mL	1 x 25 mL
Peth - Mobile Phase IIB Concentrated	30288758	1 x 27.5 mL	1 x 27.5 mL
Peth - Deproteinization solution with internal standard Concentrated	30288759	2 x 25 mL	2 x 25 mL
Tec-Trace® PEth Calibrator	30267543	-	6 x 2 x 250 µL
Tec-Trace® PEth Controls	30267544	-	3 x 3 x 250 µL

Consumables	**Order number**
Consumables (Well plate, seal and adhesive foil)	30265268
PEth - LC Column	30286448

LEARN MORE

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