Finally a More Reproducible Alternative to Liquid-Liquid Extraction for Lipid Analysis

Bond Elut Lipid Extraction

Achieve more reproducible and streamlined sample preparation for lipid analysis

In lipid analysis, sample preparation is critical to isolating lipids from any additional co-extractives, but the options have been limited. Liquid-liquid extraction (LLE) is a commonly used technique since it is widely accepted and perceived to be inexpensive. Labs may be unfamiliar with or hesitant to consider emerging technologies due to the time to get up and running and assumed costs of consumables versus LLE.

However, there are significant sacrifices made when using LLE, including method reproducibility, researchers' time and effort, and the requirement for more samples to achieve statistically reliable results.

Now, with Bond Elut Lipid Extraction solid phase extraction (SPE) cartridges and 96-well plates, you can achieve more reproducible and streamlined sample preparation for lipid analysis and reduce the need for precious samples for your research.

Average Peak Area RSD (All Identified Features)

	Bond Elut Lipid Extraction SPE	LLE 1	LLE 2	LLE 3	LLE 4
LC/MS replicates	6.4%	5.8%	6.3%	7.1%	6.0%
Extraction replicates	9.4%	22.6%	12.2%	11.2%	19.8%

% RSD Values for Bond Elut Lipid Extraction versus four common LLE techniques

With Bond Elut Lipid Extraction SPE you can:

– Achieve up to 58% time savings versus common LLE techniques

– Reduce time spent training staff for manual LLE workflows

– Improve reproducibility reducing the number of samples required for statistical validation

– Enable automation to accelerate sample processing and improve productivity

– Simplify extraction efforts compared to complicated and manual LLE techniques like sample transfer and phase separation

To learn more, please visit:
www.agilent.com/chem/ BondElutLE

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Time Savings Potential of Bond Elut Lipid Extraction versus four common LLE techniques

	Bond Elut Lipid Extraction SPE	LLE 1	LLE 2	LLE 3	LLE 4[3]
Protocol summary	SPE by 1:2 DCM/MeOH	LLE by 1:1 chloroform/MeOH	LLE by 1:1 chloroform/MeOH	LLE by 2:1 MTBE/MeOH	PPT by 1:1 BuOH/MeOH
Extraction time (minutes)	42	89	89	88	92
Additional extraction (minutes)	0	53	53	48	0
Dry and reconstitute (minutes)	30	30	30	30	40
Total time (minutes, inclusive of additional extraction, dry, reconstitute steps)	72	172	172	166	132
% Time savings achieved with Bond Elut Lipid Extraction SPE		58%	58%	57%	45%

1. Calculations based on processing 10 samples

2. DCM = dichloromethane; MeOH = methanol; MTBE = methyl tert-butyl ether; BuOH = n-butanol; PPT = protein precipitation

3. Conventional LLE methods (1-4) were used for SPE method assessment and evaluation.

   Bligh, E. G. & Dyer, W. J.. Can J Biochem Physiol 37, 911-917, (1959).

   Folch, J., et al., J Biol Chem 226, 497-509 (1957).

   Maytash, V., et al., J Lipid Res 49, 1137-1146, (2008).

   Alshehry, Z. H. et al., Metabolites 5, 389-403, (2015).

The Bond Elut Lipid Extraction method simplifies and accelerates sample processing

	Bond Elut Lipid Extraction	Liquid-Liquid Extraction
Coverage	+++	+++
Selectivity[1]	+++	+++
Ease-of-use	**++**	**-**
Reproducibility	**< 10% RSD**	**10−20% RSD**
Ease-of-automation	**+++**	**-**

1. Selective isolation of lipids in complex matrix

Bond Elut Lipid Extraction ordering information

Description	Quantity	Part Number
Agilent Bond Elut Lipid Extraction, 1 mL cartridge	100/pk	5610-2041
Agilent Bond Elut Lipid Extraction, 96-well plate	1 plate	5610-2042
Agilent Bond Elut Lipid Extraction, 96-well plate	5 plates	5610-2043

Learn more at:

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