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SOLA Solid-Phase Extraction (SPE) application note compendium

Prevent sample failures in bioanalytical workflows

ThermoFisher SCIENTIFIC

Introduction

Thermo Scientific™ SOLA™ products revolutionize solid-phase extraction (SPE). This first fritless SPE product range provides greater reproducibility with cleaner, more consistent extracts. SOLA products provide unparalleled performance characteristics compared to conventional SPE, phospholipid removal and protein precipitation products. This includes:

- higher levels of reproducibility
- higher levels of extract cleanliness
- reduced solvent requirements
- increased sensitivity

Want to know more about how SOLA products can revolutionize your analysis?
thermofisher.com/solaspe

Find out how SOLA SPE technology can revolutionize your bioanalytical sample preparation.

View the brochure

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SOLA bed weights

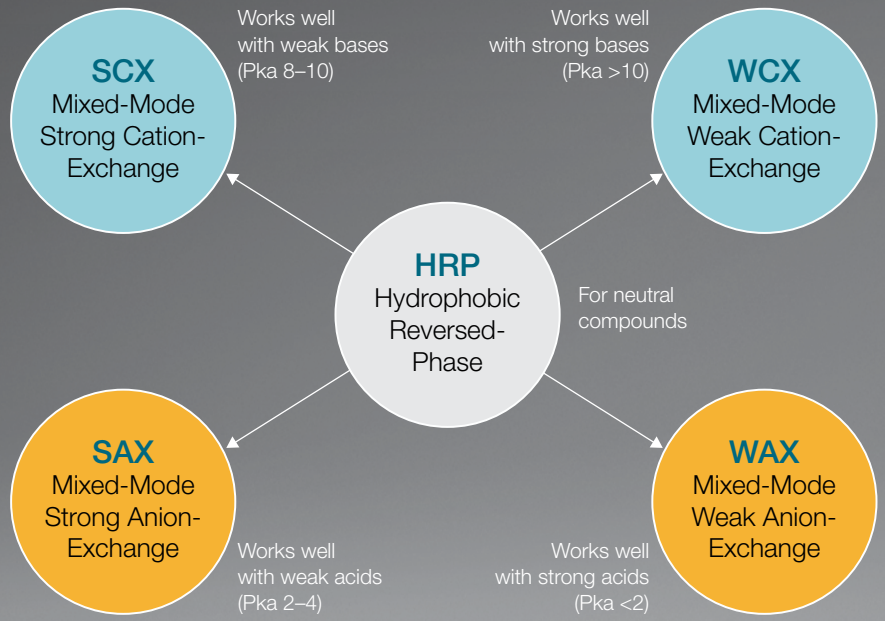
SOLAμ

SOLA 10 mg

SOLA 30 mg

SOLA SPE chemistry phases

SOLA is available in 5 different polymeric selectivity options which cover the wide range of neutral, acidic and basic analytes typically extracted in bioanalytical workflows. These include:



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WCX
Mixed-Mode
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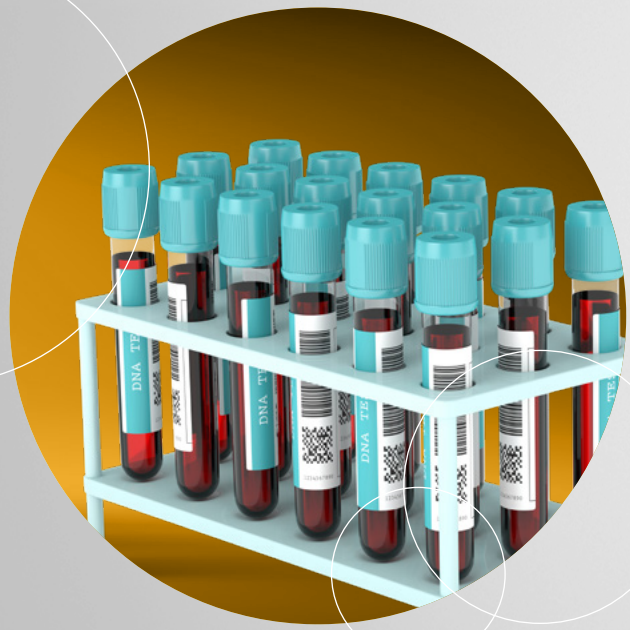

Application note 21236

Bed weight: SOLAμ
Chemistry phase: HRP
Application area: pharmaceutical

Generic SPE protocol for peptide clean-up and concentration

Author: Jon Bardsley, Thermo Fisher Scientific, Runcorn, UK

Goal

Description of a generic, reproducible and robust procedure that can be used to clean up and concentrate peptide samples. The procedure can remove unwanted buffer, reagents, and any physical particulates from the sample while maintaining high levels of analyte recovery and reproducibility. An additional benefit is the ability to concentrate the sample prior to analysis.

The method is performed using micro-elution solid-phase extraction (SPE) and, therefore, benefits from removal of post-extraction sample evaporation and reconstitution required by traditional scale SPE. Removal of these steps eliminates issues with solubility and non-specific binding (NSB) that are often associated with peptide analysis.

Introduction

Peptide analysis can present a number of issues that affect detector response, due to the presence of unwanted interferences from either the matrix or from reagents and other additives used to facilitate protein digestion. Sample preparation techniques employed to remove these interferences are required to be quick, simple, and generic. Reproducibility is also important as this enables users to confidently assign data differences to the sample and not the methodological conditions used.

View the full note

Application note 21173

Bed weight: SOLAμ
Chemistry phase: HRP
Application area: clinical research

Fast and reliable method for the analysis of testosterone, androstenedione, and 17-hydroxy progesterone from human plasma

Author: Jon Bardsley, Thermo Fisher Scientific, Runcorn, UK

Goal

To describe an accurate and precise high-throughput analytical technique for the analysis of testosterone, androstenedione, and 17-hydroxy progesterone utilizing micro-scale solid-phase extraction (SPE), followed by liquid chromatography coupled with triple quadrupole mass spectrometry (LC-MS/MS).

Introduction

Steroid hormone levels can vary from elevated to depressed states, so a fast, sensitive, and reliable analysis method is required. Measuring steroid hormones presents issues for the bioanalyst due to the high endogenous levels; obtaining blank matrices for matched standards can present a problem. Phosphate buffer saline (PBS) is regularly used as a surrogate matrix because of its low cost and availability; however, it is often not a close match for the sample requiring analysis. Treated or stripped plasma can be used as a surrogate matrix, but in order to remove trace levels of any particular compound, the level of processing required can be so high that the surrogate is no longer a close matrix match.

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Application note 21002

Bed weight: SOLAμ
Chemistry phase: SCX
Application area: clinical research

LC-MS/MS method for the determination of raloxifene and its glucuronide metabolites from human plasma using SPE micro elution for rapid, high-throughput sample processing

Authors: Krishna Rao Dara, Dr. Tushar N. Mehta, Centre of Excellence for Asia Pacific Laboratory, Thermo Fisher Scientific, Ahmedabad, India

Goal

A simple, rapid, and sensitive method for the determination of raloxifene (RAL) and its two active metabolites, raloxifene-4-glucuronide (R4G) and raloxifene-6-glucuronide (R6G), in human plasma by liquid chromatography-tandem mass spectrometry using raloxifene-d4 as an internal standard was developed and evaluated. The drug and its metabolites were extracted from a plasma matrix using a Thermo Scientific™ SOLAμ™ SCX 96-well plate. The resultant extracts were separated on a Thermo Scientific™ Hypersil GOLD™ PFP HPLC column under reversed-phase, gradient conditions. Detection was performed on a triple quadrupole Thermo Scientific™ TSQ Vantage™ mass spectrometer using positive polarity, heated electrospray ionization (HESI) conditions operating in selected reaction monitoring (SRM) mode. The method was linear in the concentration range of 0.02 to 2 ng/mL, 3 to 300 ng/mL, and 0.6 to 60 ng/mL for RAL, R4G, and R6G, respectively, with excellent separation of two glucuronide metabolites.

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Application note 21578

Bed weight: SOLAμ
Chemistry phase: SCX
Application area: clinical research

Increased speed and sample throughput of opioid analysis from human urine using micro-elution solid-phase extraction

Authors: Jon Bardsley, Joanne Jones, Thermo Fisher Scientific, Runcorn, UK

Goal

To describe a reproducible optimization procedure for the isolation of opioids from human urine utilizing solid-phase extraction (SPE). Subsequent analysis was carried out with liquid chromatography separation coupled to triple quadrupole mass spectrometry detection (LC-MS/MS).

Introduction

Solid-phase extraction (SPE) has been beneficial in selective cleanup of complex biological matrices for the analysis of diverse species and is routinely used in laboratories ranging from drug discovery to forensics. The benefits of SPE are well known and include the following:

- Cleaner samples free from matrix interferences
- Concentration of sample with lower limits of detection
- Shorter chromatography due to a less complex sample being injected

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Application note 20943

Bed weight: SOLAμ
Chemistry phase: SAX
Application area: pharmaceutical

Achieve higher bioanalytical sensitivity with SOLAμ SPE for analytes susceptible to issues during pre-concentration dry down

Authors: Jon Bardsley, Ken Meadows, Thermo Fisher Scientific, Runcorn, UK

Goal

This application note demonstrates the use of Thermo Scientific™ SOLAμ™ Solid-Phase Extraction (SPE) product for the extraction analytes which are susceptible to loss or degradation during evaporation and reconstitution. The use of a Thermo Scientific™ Accucore™ HPLC column provided fast and efficient separation without the need for an ultra high pressure system. MS/MS detection was performed on a Thermo Scientific™ TSQ Vantage™ mass spectrometer.

Introduction

In order to achieve the required detection limits many bioanalytical methods utilize dry down and reconstitution steps to concentrate analytes prior to analysis. With conventional SPE formats the elution volume is often high and the final extract is diluted. This is a problem for assays requiring a challenging lower limit of detection and is especially prevalent for newer high efficacy compounds. Existing methodology will overcome this problem by evaporating the extract and reconstituting in a smaller volume

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Application note 64718

Bed weight: SOLAμ
Chemistry phase: SAX
Application area: forensic toxicology

Quantitation of THC and THC Metabolites in Blood Using SOLAμ SPE Plates and the TSQ Quantiva Triple Quadrupole Mass Spectrometer for Forensic Analysis

Authors: Xiaolei Xie, Thomas Carrell, Marta Kozak,
Thermo Fisher Scientific, San Jose, CA, USA

Goal

To demonstrate a simple and economical quantitative method for the analysis of THC and THC metabolites in blood to address key forensic laboratory requirements.

Introduction

Cannabis is the most frequently abused drug. THC (tetrahydrocannabinol) is the major psychoactive constituent of cannabis. THC is primarily metabolized to 11-hydroxy-THC (THC-OH), which has equipotent psychoactivity and is further metabolized to non-psychoactive 11-nor-9-carboxy-THC (THC-COOH). Second-phase metabolites, THC-glucuronide and THC-COOH-glucuronide, are also present in blood and can be used as markers to determine recency of cannabis intake and to improve interpretation of analytical results. LC-MS analytical methods are widely used for analysis of THC and its metabolites in blood samples. LC-MS methods do not require sample derivatization, thus yielding savings over typical GC-MS procedures.

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Application note 21478

Bed weight: SOLAμ
Chemistry phase: WCX
Application area: pharmaceutical

Selective and highly accurate analysis of desmopressin from human plasma

Author: Jon Bardsley, Thermo Fisher Scientific, Runcorn, UK

Goal

To describe an accurate, precise, high-throughput workflow for the analysis of desmopressin from human plasma utilizing micro-elution solid-phase extraction (SPE), followed by liquid chromatography separation coupled to triple quadrupole mass spectrometry (LC-MS/MS) detection.

Introduction

Analysis of peptides presents very specific challenges for the bioanalyst: analyte solubility, non-specific binding to labware, and the ability to selectively detect a specific peptide in the presence of a complex matrix. Analysis can typically require long gradients and extensive sample preparation, which can result in low recovery levels for the peptide in question. Issues with system or column carryover can also be challenging.

Desmopressin (Figure 1) is a synthetic peptide consisting of nine amino acids and is very similar to endogenous peptides present in human plasma. Selective analysis can be achieved by combining micro-elution solid-phase extraction (SPE) with ultra-high pressure liquid chromatography (UHPLC) and ultra fast selective reaction monitoring (SRM) mass spectrometry. Micro-elution SPE provides quick and selective extraction of peptides from biological matrices without the need for post-extraction processing.

View the full note

Application note 20941

Bed weight: SOLAμ
Chemistry phase: WAX
Application area: pharmaceutical

SOLAμ for pre-analysis sample concentration

Authors: Jon Bardsley, Ken Meadows,
Thermo Fisher Scientific, Runcorn, UK

Goal

This application note demonstrates the use of Thermo Scientific™ SOLAμ™ Solid-Phase Extraction (SPE) product to enhance sample pre-concentration prior to analysis. Additional benefits include reduced workflow and stability for analytes susceptible to loss or degradation during evaporation and reconstitution. The use of a Thermo Scientific™ Accucore™ HPLC column provided fast and efficient separation without the need for an ultra high pressure system. MS/MS detection was performed on a Thermo Scientific™ TSQ Vantage™ mass spectrometer.

Introduction

Despite advances in analytical detection technology, achieving required limits of sensitivity can still be an issue for many bioanalytical laboratories. In order to improve limits of detection analysts are looking to sample preparation in order to pre-concentrate their sample prior to analysis.

Traditional scale SPE helps to clean up the sample to minimize matrix effects, however in order to pre-concentrate the sample a lengthy dry down and reconstitution step needs to be employed. This process is not only time consuming but can have a detrimental effect on the recovery of the analyte due to volatility or non specific binding.

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Application note 20942

Bed weight: SOLAμ
Chemistry phase: WAX
Application area: pharmaceutical

SOLAμ SPE – achieve highly reproducible bioanalytical results with reduced sample volumes

Authors: Jon Bardsley, Ken Meadows,
Thermo Fisher Scientific, Runcorn, UK

Goal

This application note demonstrates how the Thermo Scientific™ SOLAμ™ Solid-Phase Extraction (SPE) product can be used to facilitate the scale down of an extraction method for use when sample volume is limited. The use of a Thermo Scientific™ Accucore™ HPLC column provided fast and efficient separation without the need for an ultra high pressure system. MS/MS detection was performed on a Thermo Scientific™ TSQ Vantage™ mass spectrometer.

Introduction

Ethical, analytical and sample availability considerations are a challenge faced by many bioanalytical laboratories and have resulted in a drive to limit sample volume.

In order to achieve the required detection limits many analytical methods utilize dry down and reconstitution steps to remove the dilution effects required by traditional scale SPE when operating with very low sample volumes.

In addition many analytes, such as small volatile molecules or larger biomolecules, suffer from loss of recovery attributed to the evaporation and reconstitution step.

View the full note

Application note 21172

Bed weight: SOLAμ
Chemistry phase: WAX
Application area: clinical research

Fast and reliable method for the analysis of methylmalonic acid from human plasma

Authors: Jon Bardsley, Thermo Fisher Scientific, Runcorn, UK;
James Goldberg, Thermo Fisher Scientific, West Palm Beach, FL, USA

Goal

To describe an accurate and precise high-throughput analytical technique for the analysis of methylmalonic acid (MMA) utilizing mixed-mode ion-exchange micro-scale solid-phase extraction (SPE), followed by liquid chromatography coupled with triple quadrupole mass spectrometry (LC-MS/MS). This technique further separates MMA from the known endogenous interference succinic acid (SA), a compound that has the same molecular weight as MMA and demonstrates a similar fragmentation pattern, which can cause issues with selectivity in mass spectrometry (MS) detection. Deuterated MMA (MMA-d3) was used as an internal standard.

Introduction

Typical analysis for MMA is performed by gas chromatography-mass spectrometry (GC-MS) with lengthy chromatography and time consuming derivitization steps. By utilizing Thermo Scientific™ SOLAμ™ WAX Solid-Phase Extraction (SPE) plates, a fast, reproducible, and reliable method can be created to accurately measure levels of MMA from plasma samples. High levels of recovery for MMA can be achieved with minimal matrix effects in a high-throughput workflow.

View the full note

Application note 21882

Bed weight: SOLA 10 mg
Chemistry phase: HRP
Application area: clinical research

Robust extraction, separation, and quantitation of structural isomer steroids from human plasma by SPE-UHPLC-MS/MS

Authors: Jon Bardsley[1], Kean Woodmansey[1], and Stacy Tremintin[2]
[1]Thermo Fisher Scientific, Runcorn, UK; [2]Thermo Fisher Scientific, Sunnyvale, CA, USA

Goal

Achieve separation of 12 steroid hormones including structural isomers. Comparison to more popular C18 phase is assessed, as well as extraction from human plasma using polymeric solid-phase extraction.

Introduction

Accurate measurement of steroids in plasma is an important requirement in clinical research laboratories. Triple quadrupole mass spectrometry (MS/MS) is now a standard platform in this area for detection due to speed and sensitivity, however this group of compounds contains many structural isomers that cannot be differentiated by MS/MS alone. This may lead to inaccurate analysis by over estimation of concentration levels. Separation prior to MS/MS detection must be achieved, typically by liquid chromatography (LC). An analytical method utilizing LC-MS/MS combined with solid-phase extraction of plasma samples is used to remove many matrix interferences, separate isomers, and detect 12 steroids, with an assessment of method performance is reported here.

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Application note 20936

Bed weight: SOLA 10 mg
Chemistry phase: HRP
Application area: clinical research

SPE and LC-MS/MS method for the determination of 25-Hydroxyvitamin D2 and 25-Hydroxyvitamin D3 from human plasma

Authors: Jon Bardsley, Ken Meadows, Joanne Jones,
Thermo Fisher Scientific, Runcorn, UK

Abstract

A liquid chromatography-tandem mass spectrometry method for 25-hydroxyvitamin D2 and 25-hydroxyvitamin D3 from human plasma has been developed. Sample preparation was fast and e cient using a Thermo Scientific™ SOLA™ hydrophobic reversed-phase (HRP) plate. Analysis was carried out using a Thermo Scientific™ Syncronis™ C18 1.7 µm, 50 × 2.1 mm column to give a fast separation with a cycle time of 2 minutes while maintaining excellent peak shape.

The reproducibility of the method was measured at three concentrations for each compound and was less than 4.2% (n=6 at each level). Excellent recoveries of 94.4% (25-hydroxyvitamin D2) and 96.3% (25-hydroxyvitamin D3) were also achieved. The dynamic range was linear between 5 and 1000 ng/mL with r2 values of 0.9994 and 0.9958 for 25-hydroxyvitamin D2 and 25-hydroxyvitamin D3, respectively.

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Application brief 21934

Bed weight: SOLA 10 mg
Chemistry phase: SCX
Application area: general methodology

Extraction of hydrophobic weak bases from complex liquid samples with SOLA SCX SPE

Author: Thermo Fisher Scientific

Introduction

Thermo Scientific™ SOLA™ is a solid-phase extraction (SPE) cartridge featuring mixed-mode polymeric sorbent and a fritless design for small sample sizes (typically 25–400 µL). It is available in SOLA 10 mg and Thermo Scientific™ SOLAµ™ 2 mg formats. The fritless design reduces hold-up volume and improves consistency of extraction. The SOLA SCX has reversed-phase (RP) and strong cation exchange (SCX) functions. The typical use is for the extraction of hydrophobic weak bases from complex liquid samples.

Important notes

- Maximum loading capacity is ~10% of sorbent weight
- Sample should be processed through the cartridge at about 1 mL/min; too high a flow can lead to inconsistent results
- The volumes given are typical, and should be optimized for the analyte and matrix of interest

View the full brief

Technical note 21965

Bed weight: SOLA 10 mg
Chemistry phase: SCX
Application area: forensic toxicology

Quantitative determination of seven synthetic cathinones (stimulants) from stabilized human urine by UHPLC-MS/MS for forensic toxicology

Authors: Kean Woodmansey, Matthew Franklin,
Thermo Fisher Scientific, Runcorn, UK

Goal

To develop and assess a quantitative analytical method for the determination of seven synthetic cathinones from stabilized human urine. The Thermo Scientific™ Syncronis™ HILIC 1.7 µm column is used in combination with the Thermo Scientific™ Vanquish™ Horizon UHPLC system and Thermo Scientific™ TSQ Quantiva™ triple-stage quadrupole MS/MS system. Thermo Scientific™ SOLA™ SCX Solid-Phase Extraction (SPE) technology is used for sample clean-up prior to analysis.

Introduction

In recent years, the synthesis and availability of new and novel psychoactive substances have been increasingly reported. The availability of analytical methods to detect these new compounds from biological matrices has not kept up with this pace of change.

View the full note

Application brief 21935

Bed weight: SOLA 10 mg
Chemistry phase: SAX
Application area: general methodology

Extraction of hydrophobic weak acids from complex liquid samples with SOLA SAX SPE

Author: Thermo Fisher Scientific

Introduction

Thermo Scientific™ SOLA™ is a solid-phase extraction (SPE) cartridge featuring mixed-mode polymeric sorbent and a fritless design for sample sizes up to 500 µL. It is available in SOLA 10 mg and Thermo Scientific™ SOLAµ™ 2 mg formats. The fritless design reduces hold-up volume and improves consistency of extraction. The SOLA SAX has reversed-phase (RP) and strong anion exchange (SAX) functions. The typical use is for the extraction of polar acids and hydrophobic weak acids from complex liquid samples.

Important notes

- Maximum loading capacity is ~10% of sorbent weight for RP and 0.8 meq/g for Ion Exchange
- Sample should be processed through the cartridge at about 1 mL/min; too high a flow can lead to inconsistent results
- The volumes given are typical, and should be optimized for the analyte and matrix of interest

View the full brief

Application note 20966

Bed weight: SOLA 10 mg
Chemistry phase: SAX
Application area: clinical research

Clinical research method for the quantitative determination of free plasma serotonin and 5-hydroxyindoleacetic acid (5-HIAA) in human plasma by UHPLC-MS/MS

Authors: Callum Taylor and Kean Woodmansey,
Thermo Fisher Scientific, Runcorn, UK

Goal

To develop and assess a clinical research method for the quantitation of serotonin and 5-HIAA from human plasma for clinical research. Thermo Scientific™ SOLA™ SAX Solid-Phase Extraction (SPE) technology is used for sample clean-up of the plasma prior to analysis. A Thermo Scientific™ Acclaim™ Vanquish PA2 UHPLC 2.2 µm column is used on the Thermo Scientific™Vanquish Horizon™ UHPLC system coupled with the Thermo Scientific™ TSQ Quantiva™ MS/MS.

Introduction

The use of antidepressants, particularly selective serotonin reuptake inhibitors (SSRIs), is on the rise in our modern society due in part to a greater awareness of mental illness and increased research into such disorders. It is believed that these drugs act specifically on the body's ability to re-absorb serotonin into nerve cells, thereby initiating an effect via an increase in brain serotonin levels. However, serotonin toxicity can arise from the use of more than one of these SSRIs or in conjunction with a monoamine oxidase inhibitor (MAOi) and can result in hospitalization and death.

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Application brief 21932

Bed weight: SOLA 10 mg
Chemistry phase: WCX
Application area: general methodology

Extraction of hydrophobic bases from complex liquid samples with SOLA WCX SPE

Author: Thermo Fisher Scientific

Introduction

Thermo Scientific™ SOLA™ is a solid-phase extraction (SPE) cartridge featuring mixed-mode polymeric sorbent and a fritless design for small sample sizes (typically 25–400 µL). It is available in SOLA 10 mg and Thermo Scientific™ SOLAµ™ 2 mg formats. The fritless design reduces hold-up volume and improves consistency of extraction. The SOLA WCX has reversed-phase (RP) and weak cation exchange (WCX) functions. The typical use is for the extraction of hydrophobic bases from complex liquid samples.

Important notes

- Maximum loading capacity is ~10% of sorbent weight
- Sample should be processed through the cartridge at about 1 mL/min; too high a flow can lead to inconsistent results
- The volumes given are typical, and should be optimized for the analyte and matrix of interest

View the full brief

Application brief 21933

Bed weight: SOLA 10 mg
Chemistry phase: WAX
Application area: general methodology

Extraction of hydrophobic acids from complex liquid samples with SOLA WAX SPE

Author: Thermo Fisher Scientific

Introduction

Thermo Scientific™ SOLA™ is a solid-phase extraction (SPE) cartridge featuring mixed-mode polymeric sorbent and a fritless design for small sample sizes (typically 25–400 µL). It is available in SOLA 10 mg and Thermo Scientific™ SOLAµ™ 2 mg formats. The fritless design reduces hold-up volume and improves consistency of extraction. The SOLA WAX has reversed-phase (RP) and weak anion exchange (WAX) functions. The typical use is for the extraction of hydrophobic acids from complex liquid samples.

Important notes

- Maximum loading capacity is ~10% of sorbent weight
- Sample should be processed through the cartridge at about 1 mL/min; too high a flow can lead to inconsistent results
- The volumes given are typical, and should be optimized for the analyte and matrix of interest

View the full brief

Application brief 21937

Bed weight: SOLA 10 mg
Chemistry phase: HRP, SCX, SAX
Application area: general methodology

SPE for biological fluids

Author: Thermo Fisher Scientific

Introduction

Sample preparation is a critical step prior to LC or GC analysis. Due to their nature, biological fluids such as serum, plasma, blood, and urine present a difficult challenge.

Solid-Phase Extraction (SPE) can be used for three important purposes:

- Removal of interfering matrix components. This can help protect analytical instrumentation and columns from “dirty” biological samples
- Concentration of the sample to increase sensitivity of the analysis
- Transfer of analytes into a suitable solvent for analysis. This can help make the sample more compatible for analysis.

View the full brief

Application note 22053

Bed weight: SOLA 30 mg
Chemistry phase: HRP
Application area: clinical research

Vitamin D biomarkers in plasma

Author: Matthew Franklin, Thermo Fisher Scientific, Runcorn, UK

Goal

Maximizing the sensitivity of vitamin D biomarker quantitation assay in human plasma by leveraging Thermo Scientific™ SOLA™ HRP Solid-Phase Extraction (SPE). Analysis carried out on the Thermo Scientific™ Vanquish™ Horizon UHPLC system and Thermo Scientific™ TSQ Quantiva™ mass spectrometer with the Thermo Scientific™ Hypersil GOLD™ VANQUISH™ C18 UHPLC column, 1.9 µm, 2.1 × 50 mm, for developing a fast, robust, reliable LC-MS method.

Introduction

Solid-phase extraction (SPE) is an e cient extraction technique to separate critical analytes that are dissolved or suspended in a liquid mixture according to their physical and chemical properties. The extraction detailed here from human plasma is carried out using SOLA HRP 30 mg cartridges. Its revolutionary design is specifically tailored for processing biological samples and helps reduce blocking and sample failures.

Vitamin D is widely monitored and used as an indicator for skeletal health in both children and adults. The active form of the hormone controls the concentration of calcium and phosphorous in the bloodstream, with deficiencies resulting in both rickets in children and osteoporosis in adults. Vitamin D occurs in two forms: vitamin D_2 (ergocalciferol) is found naturally in plants and is commonly used as a dietary supplement; vitamin D_3 (cholecalciferol) occurs naturally in mammals and is formed in the skin by exposure to sunlight.

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Application note 22048

Bed weight: SOLA 30 mg
Chemistry phase: SCX
Application area: pharmaceutical

Analysis of free plasma ethinyl estradiol

Author: Callum Taylor, Thermo Fisher Scientific, Runcorn, UK

Goals

- Develop a sample preparation protocol using the new SOLA 30 mg SPE SCX phase
- Enable development and optimization of a sensitive liquid chromatography with tandem mass spectrometry (LC-MS-MS) assay for ethinyl estradiol (EE) in human plasma with minimal matrix effects and high recovery
- Develop a chromatographic separation on a Thermo Scientific™ Vanquish™ Horizon UHPLC system coupled with a Thermo Scientific™ TSQ Altis™ Triple Quadrupole Mass Spectrometer
- Showcase outstanding performance of the Thermo Scientific™ Hypersil GOLD™ VANQUISH™ UHPLC columns

Introduction

This application note describes the use of the Thermo Scientific™ SOLA™ 30 mg 96-well SPE plates to achieve an exceptionally sensitive assay in the range of 5.00 to 200 pg/mL for free plasma ethinyl estradiol due to the high loading capacity of the SOLA sorbent material. SOLA is a revolutionary form of solid-phase extraction (SPE) that incorporates a fritless polymeric sorbent and is produced using advanced packing techniques.

View the full note

Application note 22054

Bed weight: SOLA 30 mg
Chemistry phase: WCX
Application area: clinical research

Quantitation of acetylcholinesterase inhibitors

Author: Callum Taylor, Thermo Fisher Scientific, Runcorn, UK

Goals

- Develop a sensitive ultra-high-performance liquid chromatography-tandem mass spectrometer (UHPLC-MS/MS) method for several acetylcholinesterase inhibitors in human plasma, utilizing the high load-ability of the Thermo Scientific™ SOLA™ 30 mg WCX SPE phase
- Ensure assay has low matrix effects and high recovery for all analytes
- Demonstrate the high separation performance and excellent peak shapes provided by the Thermo Scientific™ Accucore™ Polar Premium LC column for the analysis of samples from plasma

Introduction

This application note describes the use of the Thermo Scientific™ SOLA™ 30 mg cartridges to achieve an exceptionally sensitive assay in the range of 0.050–50 ng/mL for neostigmine, pyridostigmine, and edrophonium due to the high loading capacity of the SOLA sorbent material. SOLA is a revolutionary form of solid-phase extraction (SPE) that incorporates a fritless polymeric sorbent and is produced using advanced packing techniques. This means that it removes the issues commonly associated with conventional SPE. The removal of these issues results in higher levels of reproducibility in processing viscous biological samples by reducing blocking and sample failures.

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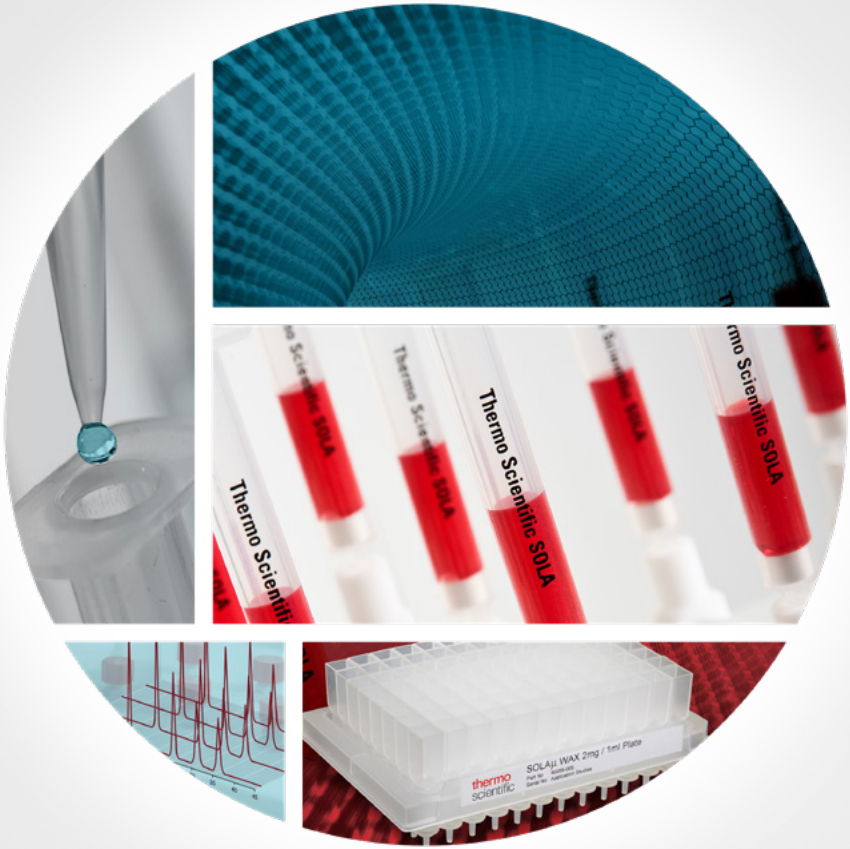

Get more out of your SPE sample prep

Unrivaled performance with unique fritless SPE

Sample preparation is often inconvenient. On bad days, it's totally ineffective—resulting in sample failure, costly re-runs and lost time. Put the odds in your favor with Thermo Scientific™ SOLA™ Solid-Phase Extraction (SPE) cartridges and plates. Award-winning fritless technology eliminates conventional SPE issues like voiding, blocking and channeling. All so that your lab can remove variability, reduce failure rates and optimize high throughput workflows.

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