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APPLICATION BRIEF 21932

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

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Solid Phase Extraction (SPE), small molecule purification, extraction of hydrophobic bases

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

Materials required

- Methanol, LCMS grade
- 2% formic acid in methanol, LCMS grade
- 5% ammonium hydroxide in water, LCMS grade
- 10–30% acetonitrile in water (optional), LCMS grade
- SPE vacuum manifold, vacuum regulator, vacuum pump
- 96-well collection plate, appropriate to final extract volume, 25–200 µL per sample
- Waste-collection tray or plate, ~1800 µL per sample
- Pipettes and tips

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Protocol

1. Prepare the sample for extraction
   - Dilute viscous samples (e.g., plasma) 1:1 with water
   - When the analytes bind to matrix proteins, 1:1 dilution with 10–30% aqueous acetonitrile can improve recovery
   - Adjust to a pH ≤ pKa – 2 and pH ≥ 7 as necessary to ionize the analytes and SPE
   - Add internal standard if desired
2. Prepare the SOLA SPE for sample loading
   - Wash with 2 × 100 µL of methanol (optional)
   - Wash with 2 × 100 µL of 5% ammonium hydroxide in water. Do not let cartridge dry before loading sample.
3. Load the sample onto the SOLA SPE at a flowrate of about 1 mL/min
   - Up to 800 µL of prepared sample
4. Wash away interferences
   - Wash with 2 × 100 µL of 5% ammonium hydroxide in water. This removes salts, acids, proteins, carbohydrates.
   - Wash with 2 × 100 µL of methanol. This removes hydrophobic, neutral and anionic matrix components. Alkaline methanol can improve recovery of cationic analytes for some cases. Let cartridge dry a few minutes before elution.
5. Collect analyte fraction in the sample well plate
   - Elute with ≥2 × 12.5 µL (SOLAµ) or ≥2 × 50 µL (SOLA) of 2% formic acid in methanol. Elute each aliquot initially by gravity then apply vacuum/pressure to ensure all solvent is eluted from the cartridge.
6. Post-extraction
   - If necessary, evaporate and re-constitute in a compatible solvent
   - For RP-LC analysis, dilute to ≤50% organic solvent

Related products

Description	Part Number
SOLA WCX, 10 mg/1 mL Cartridges	60109-004
SOLAµ WCX, 10 mg/1 mL 96 Well Plates	60209-004
SOLA WCX, 10 mg/2 mL 96 Well Plates	60309-004
Thermo Scientific™ Hypersep™ Universal SPE Vacuum Manifold, for 96-well plate or 24/48 cartridges	60104-230
Thermo Scientific™ Hypersep™ Vacuum Pump, European version	60104-241
Thermo Scientific™ Hypersep™ Vacuum Pump, North American version	60104-243

Current versions of product instructions are available at **separatedbyexperience.com/chromexpert**

Learn more about SOLA and SOLAµ Solid Phase Extraction at **thermofisher.com/solaspe**

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