

Supercritical Fluid Application Notes

**SCF
525**

Extraction of Sulfonamides from Chicken Liver using Supercritical Fluoroform (CHF₃)

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Introduction

This application describes a method to extract sulfonamides from fortified chicken liver using supercritical fluoroform (CHF₃). Methanol-modified CHF₃ provides an average recovery approaching 100% for various sulfonamides and produces a significantly cleaner extract than other supercritical solvents.



Equipment

- ✓ Applied Separations' *Spe-ed*TM SFE-2 or Helix Supercritical Extraction System
- ✓ SFE Modifier Pump

Materials

- ✓ Fluoroform, SFE grade, Air Products
- ✓ Methanol
- ✓ C18 SPE cartridges, Applied
 - ✓ Separations (Cat. #12007)
- ✓ *Spe-ed* Matrix (Cat. #7950)
- ✓ *Spe-ed* Polypropylene Wool (Cat. #7952)

Method

Spike 1 gram of homogenized chicken liver with 10 µL of a drug mixture (0.6g/L of SMZ, 0.5g/L of SDM and 0.5g/L of SQA). Mix spiked chicken liver with 2 grams of *Spe-ed* Matrix. Place a plug of *Spe-ed* Wool into an extraction vessel and pour the prepared sample into the vessel using a funnel, then place a plug of *Spe-ed* Wool on top. Compress the sample with a tamping rod, fill the void volume with *Spe-ed* Matrix, then seal the vessel. Install the vessel into the *Spe-ed* SFE. Place a predried and preweighed collection vial containing a plug of *Spe-ed* Wool on the discharge tube. Extract sample according to the specified extraction conditions.

Extraction Conditions

Extraction vessel:	10 mLs
Sample:	1 g
Pressure:	6500 psi
Temperature:	40°C
Valve temperature:	120°C
CHF ₃ Flow Rate:	2 L/min
Dynamic time:	30 minutes
Modifier:	Methanol 200µL/min
Collection:	C18 SPE cartridge
SPE Elution:	5 mLs of 0.5M phosphate buffer/methanol (50/50)

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Analysis

HPLC: Waters 6000
Column: C18, 5 micron, 250 x
4.6 mm, Supleco
Mobile Phase: 60/40 0.5M phosphate
buffer/ MeOH pH 7.1
Flow Rate: 1 mL/min
Detection: 265 nm

Results

Percent recovery of sulfamethazine (SMZ), sulfadimethoxine (SDM), and sulfaquinolone (SQA) from chicken liver.

	% Recovery	RSD
SMZ	99.8	4
SDM	85.8	12
SQA	31.2	14

Conclusion

The supercritical fluoroform extraction of sulfonamides from chicken liver offers a viable alternative to traditional procedures that are time consuming and solvent intensive. The use of fluoroform reduced the amount of coextracted fat and simplified the post extraction cleanup. Simple off-line collection of the extracts with SPE cartridges is efficient and requires no further sample cleanup.

References

Ashraf-Khorassani, M. and Taylor, L.
"Comparison of Supercritical CHF₃ and CO₂ and Methanol-modified CHF₃ and CO₂ for Extraction of Sulfonamides from Chicken Liver." *J. of AOAC*. 1996, 22 (5), 1043-1049.

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