


series	cap color	membrane	pore size	part #
eXtremelFV®		PTFE	0.45µm	85540

## Tea Analysis with eXtremelFV® by GC-MS

### Introduction

This method investigates whether SPE is required for the analysis of pesticides in green tea leaves using GC-MS. To simplify the comparison, the method utilizes an existing validated ISO method for the analysis of pesticides in food and natural products. The method is comprised of two sections: first, the extraction of the pesticides from the sample; second, the sample clean-up required for GC/MS.

### Experimental

#### Sample Preparation for Green Tea Leaves

- Current method uses a salt extraction followed by SPE clean-up.
- Improved method uses a salt extraction followed by Thomson eXtremelFV® clean-up.
- One large sample is extracted and then split in half. Half the sample goes through SPE and the other half through the eXtremelFV®.
- 2.0g of commercially available Green Tea is spiked with 0.2mL of 1.0 ppm pesticide standard mix containing 87 pesticides in a 40mL vial for a final concentration of 0.050 ppm.

#### SPE Cleanup Prior to Analysis - 6 mL Combo SPE Cartridge

1. Wash one 6 mL Combo SPE Cartridge (packed with 200 mg CarboPrep 200 and 400mg PSA) with acetonitrile.
2. Add the 10mL portion of the re-suspended residue from the flask labeled “for SPE” to the SPE cartridge.
3. Elute the sample from the cartridge with 50mL of acetonitrile.
4. Concentrate the eluted sample to 10mL using a Turbovap II concentrator.
5. Filter sample with a syringe and syringe filter, PTFE 0.45µm and elute into autosampler vial

#### Thomson eXtremelFV® Cleanup Prior to Analysis

1. Add 400µL of the re-suspended residue from the flask labeled “for Thomson eXtremelFV®” to the shell of one Thomson eXtremelFV® 0.45µm.
2. Insert plunger completely.

#### Equipment Conditions

Samples were analyzed utilizing an Agilent Technologies GC/MS, 7000 Triple Quad system equipped with a 7890A GC system and 7693 auto sampler.

### Results

The results for the green tea can be seen in Table 1, Pesticides in Green Tea Comparison of SPE to eXtremelFV®s and Fig. 1, Pesticides in Green Tea Comparison of SPE to eXtremelFV®, below, shows the recoveries for both clean-up methods: SPE and syringe filter (PTFE 0.45µm) and Thomson eXtreme® Filter Vial. The results show Thomson eXtreme® Filter Vials offer a viable alternative with higher recovery and less preparation time compared to SPE for the sample clean-up of tea leaves and for the clean-up of samples prior to pesticide analysis.

Fig 1. Pesticides in Green Tea Comparison of SPE to eXtreme|FV®s.

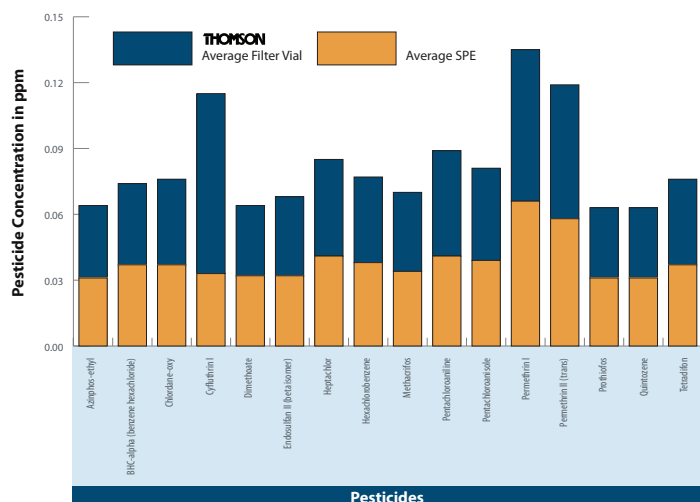
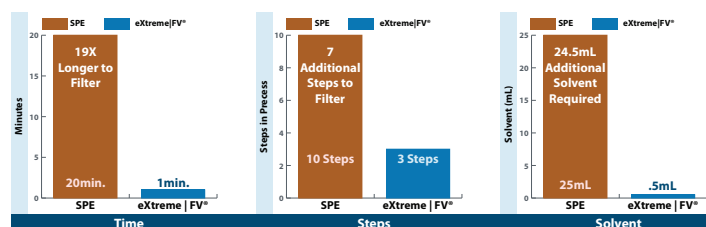


Table 1. Pesticides in Green Tea Comparison of SPE to eXtreme|FV®s.

Compound/Sample Name	SPE Clean-up Average ppm	eXtreme FV® Clean-up Average ppm
Azinphos-ethyl	0.031	0.033
BHC-alpha (benzene hexachloride)	0.037	0.037
Chlordane-oxy	0.037	0.039
Cyfluthrin I	0.033	0.082
Dimethoate	0.032	0.032
Endosulfan II (beta isomer)	0.032	0.036
Heptachlor	0.041	0.044
Hexachlorobenzene	0.038	0.039
Methacrifos	0.034	0.036
Pentachloroaniline	0.041	0.048
Pentachloroanisole	0.039	0.042
Permethrin I	0.066	0.069
Permethrin II (trans)	0.058	0.61
Prothiofos	0.031	0.032
Quintozene	0.031	0.032
Tetradifon	0.037	0.039

## SPE -vs- eXtreme|FV®



## Conclusion

The results clearly show Thomson eXtreme|FV®, 0.45µm, PTFE Filter Vials patented (Thomson # 85540-500) offer a viable alternative with equivalent recovery and significantly less preparation time and solvent usage compared to sample clean-up with SPE for the preparation of green tea samples prior to pesticide analysis. Future testing is required to further streamline this method by re-evaluating the extraction procedure, specifically the need for the concentration/re-suspension steps.