

Organic Application Note



Oil in Safflower Seed—AOCS 3-96

Standard Method Used for Comparison

Petroleum Ether Extraction

Accessories

501-081 Glass Wool; 502-327 LECO-Dry; 502-369 Kimwipe®

Collection Vial Preparation Procedure

1. Cut 1.3 to 1.5 g of glass wool from the end of the glass wool rope.
2. Pull the compact section of glass wool apart so that the material is loosened considerably.
3. Pack the loosened glass wool into the collection vial with a clean spatula, a little at a time. The goal is to have random, not vertical orientation of wool strands.
4. Tare the empty balance pan.
5. Weigh collection vial and enter initial vial weight into the instrument.
6. Install the collection vial on the instrument collection system.

Sample Preparation Procedure

1. Grind seed sample as for conventional solvent extraction.
2. Install a lower end-cap assembly on a thimble and place in a thimble stand.
3. Pack 1/4 of a Kimwipe into the bottom of the thimble by folding it once and packing it into the bottom of the thimble with a clean spatula.
4. Place the thimble on the balance and transfer ~2.0 g of the prepared sample into the thimble using the funnel.
5. Return the thimble to the balance and enter the sample weight into the instrument.
6. Fill the upper void in the thimble with LECO-Dry.
7. Install the upper end-cap assembly on the thimble.

Extraction Parameters/Procedure

1. Set up (or recall and activate) the following instrument parameters:

| | |
|-------------------------|------------|
| Extraction Pressure: | 7500 psi |
| Extraction Temperature: | 100°C |
| HVR Temperature: | 100°C |
| Hold Time: | 0 minutes |
| Extraction Time: | 45 minutes |
| Flow Rate: | 2.0 lpm |
2. The pump head should be at 0°C or below from the last set of extractions. However, the refrigeration system times out and stops 20 minutes after extractions end. If the system has timed out, pre-cool the pump head by pressing any key on the key pad. The thimble and HVR temperatures should also be at set values. Temperatures can be displayed using the "Ambient Monitor" menu.
3. Insert the thimbles into the instrument and press the START key. The extraction will automatically take place, and the system will depressurize.



TFE2000

Post-Extraction Manipulations

1. Remove the collection vials from the instrument.
2. Using the thimble removal tool, remove the thimbles and place them in the thimble stand to cool.
3. Tare the empty balance pan.
4. Weigh each collection vial and enter the weight into the instrument.
5. Results will be automatically calculated. Choose the print option to receive a printout of the results.

Typical Results

| Sample ID | Weight (g) | TFE2000 Fat (%) | Standard Method Petroleum Ether Extraction (%) |
|--------------|------------------|--------------------|--|
| Safflower #1 | 1.0181 | 41.39 | 41 |
| | 0.9783 | 41.76 | |
| | 1.0350 | 41.57 | |
| | Average | 41.57 | |
| | Std. Dev. | 0.18 | |
| Safflower #2 | 1.9652 | 40.64 | 40 |
| | 2.1415 | 40.24 | |
| | 2.0916 | 40.23 | |
| | Average | 40.37 | |
| | Std. Dev. | 0.23 | |
| Safflower #3 | 1.9644 | 35.60 | 36 |
| | 2.2512 | 36.07 | |
| | 1.9765 | 36.30 | |
| | Average | 35.99 | |
| | Std. Dev. | 0.35 | |
| Safflower #4 | 2.2268 | 38.55 | 37 |
| | 2.0402 | 39.01 | |
| | 2.0009 | 38.78 | |
| | Average | 38.78 | |
| | Std. Dev. | 0.23 | |

The LECO **TFE2000** was developed to safely extract fats/oils from your food, feed, and oilseed samples by using an advanced analytical technique. Extensive research proves that liquid CO₂ at elevated pressures and temperatures is the most effective extraction solvent for these target applications. Extraction by CO₂ offers superior performance over conventional organic solvents plus:

speed—simultaneous extractions take just minutes to complete;
method development is simplified

low cost—a CO₂ tank will supply extraction solvent for
approximately 100 extractions; no disposal or recycle cost

convenience—no need for solvent evaporation steps in the method

safety—non-toxic, non-explosive



LECO Corporation • 3000 Lakeview Ave. • St. Joseph, MI 49085-2396
Phone: 800-292-6141 • Fax: 269-982-8977
info@leco.com • www.leco.com • ISO-9001 No. FM 24045