
Soxhelet Apparatus

SZF-06C

DRAWELL
A r t i s t o f S c i e n c e

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SZF-06C Fat Analyzer

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SZF-06C fat analyzer generally consists of 3 modules, heating-up, extraction, solvent recovery & cooling. It features close and compact structure, easy operation and fast extraction, by which analysing time is remarkably shortened.

This apparatus's temperature control and electric heating are all automatic, can measure 6 samples at one time, and it seals well, with no leakage of the three wastes and safe to operate; when operating, heating temperature is even and can be adjusted in line with reagent's boiling point and ambient temperature, realizing fast determination. Reagents is recoverable, thus lowering assay cost, and infusion, extraction, recovery can be finished at one time. Test results all meet with GB/T5512..GB/T6433, this apparatus is an ideal choice for oil refinery, research institutes, universities and colleges, food and feed industry to measure fat content.

1. Working Principle

SZF-06C fat analyzer takes use of Soxhlet extraction and weight determination method to analyze fat content, that is, dissolve fat with organic solvent, then extract fat from the solvent, dry it and weigh, finally calculate the fat content.

2. Technical Parameters

a.measurement range: cereals, feed, oily seeds and various oily products with 0.5%-60% oil

b.sample number:6/batch

c.measurement duration(on apparatus):depend on oil content(as shown in Tab.1)

d.repeatability:take duplicate samples to test, average the two values as result

when fat content $\geq 10\%$, allowable relative deviation is 3%.

when fat content $< 10\%$, allowable relative deviation is 5%.

e.power:220V, 50Hz

f.power rating:300W

g.heating duration:about 10 min

h.solvent recovery ratio $\geq 80\%$ (reflux speed 120 drops/min, 2 hours, cooling water temperature $\leq 30^{\circ}\text{C}$)

i.temperature: ambient $+5^{\circ}\text{C}$ ~ 200°C

g. external dimensions:550 \times 320 \times 626

k.weight:20kg

3. Using Instruction

1. lab qualifications

1.1 fat analyzer and tools

1.2 analytical balance: sensitivity 0.0001g

1.3 drying box (electrothermostat)

1.4 crusher and mortar for laboratory use

1.5 drying box with allochroic silicagel

1.6 absorbent cotton, wide neck flask, absorbent yarn, absorbent thread

1.7 filter-paper barrel: fold circular filter paper of diameter 125mm into filter-paper barrel of external diameter 24mm, 50mm in length, the filter paper is favorably of two layers and degreased.

2. reagents

absolute ether, standard AR(HG₃-1002-76)

3. preparation before operation

3.1 sample preparation: (sample must be clean and dry, use the quartation method to evenly take sample.)

3.1.1 grains and cereals: foodstuff and beans(except peanut), take 30~50g clean and dry sample with no impurity, grind it and sieve with round-hole mesh of diameter 1mm, keep it in a wide neck bottle for later use.

3.1.2 small oil seeds: such as sesame, rapeseed, take about 20g clean and dry sample with no impurity, place it in a wide neck bottle for later use.

3.1.3 big oil seeds: like peanut, castor seed, sunflower seed, weigh 30~50g net and dry sample, grind it one by one, weigh kernel and shell separately, then calculate the kernels' percentage, slice and store them in a wide neck bottle.

3.2 clean extraction cylinder with boiled water until no impurity left, place it in a drying box(at 105°C)to dry for 1hour, then fetch out to number and weigh it, put it back to the drying box for cooling and storage.

3.3 place cylinder-shaped filter-paper barrels in a container for them.(the upper end of filter paper shouldn't be above inner tank of the container.)

3.4 check if the power cable is unbroken and the connection with water source is fast.

3.5 turn on power, set up temperature controller and temperature-adjustment knob, preheat for 15 min.

4. Operation

4.1 Sample: 1. for samples with low oil and fat content like cereals and feed, weigh ground sample of 2g with accuracy of 0.0002g. Lay a layer of absorbent cotton on the bottom of filter-paper barrel, then shift the sample to the barrel, cover the sample with another layer of absorbent cotton; 2. for oily seeds with high oil and fat content, weigh 2g preparative sample, pour it into a baking box then put the box inside a drying cabinet to bake 30min at 105°C, later quickly pour the sample into a mortar, grind it when it's hot, add proper absorbent yarn(about 2 g) when the sample is crushed, keep grinding until the sample is oily(attention: the sample should be oily but not sticky, a little porous), shift it to the filter-paper barrel with a layer of absorbent cotton at the bottom; dip little ether with absorbent cotton to wipe sample and fat inside the mortar (better clean the mortar with little ether) , add them to the filter-paper barrel, also cover the sample with absorbent cotton, put them inside the extractor.

4.2 Put the filter-paper barrel into hanging basket, shift the removable bulb, sticking the hanging basket with magnetic steel.

4.3 Infuse 50ml absolute ether into extraction bottle, then place the bottle on electric hot plate, adjust to keep good touch.

4.4 contact water supply tube and drain tube, switch on the apparatus, adjust heating temperature according to needs, the display panel will show the value.

4.5 Slide the removable bulb upwards to embed the sample in the extraction bottle, the bottom of

filter-paper barrel reaches the bottle, try to keep the barrel from falling off and the sample fully immersed in the solvent.

4.6 Immerse when the solvent starts to volatile(duration is depended by oil content as shown in the table, extraction time is also included), raise the filter-paper barrel for 5cm to make extraction, later raise another 1cm to the top, meanwhile close wholly the cock for condensation tube to recover the solvent for about 15 min.

4.7 First unscrew the ground mouth of condensation tube from extraction bottle, lift the condensation tube, then pull down red bulb, raising hanging basket to the top to facilitate separating extraction bottle from the apparatus, place the bottle within a thermostat, dry it then move into drying cylinder for cooling, weigh the analyte and calculate oil content.

4.8 After operating, turn off power, and make the inner clean.

4.9 Calculation

(a) follow formula (1), (2) and (3) to calculate crude fat content with wet base, dry base and standard wet & impurities respectively.

$$(1) \text{ crude fat (wet base \%)} = W_1 \div W \times 100$$

$$(2) \text{ crude fat (dry base \%)} = W_1 \div W \times (100 - M) \times 100$$

$$(3) \text{ crude fat (standard wet \& impurities)} = W_1 \times (100 - M \text{ standard}) \div W \times (100 - M) \times 100$$

among the formula: W_1 —weight of crude fat(g)

W —weight of sample(g)

M —wet content of sample%

M standard—total content of standard wet and standard impurities within sample

(b) to test crude fat content of shelly oil seed, use formula (4) and (5) for conversion:

$$(4) \text{ crude fat content of shelly oil seed (wet base \%)} = N \times A \div 100$$

$$(5) \text{ crude fat content of shelly oil seed (dry base \%)} = N \times A \div (100 - M)$$

among the formula: N —fat content (wet base) of shelly oil seed's kernel

A —percentage of seed with kernel among all shelly oil seeds

M —wet content of shelly oil seed

Two experimental results' allowable deviation conforms to GB5512 GB6433.

5. Matters Need Attention (common breakdowns)

5.1 The cock for condensation tube may expand when heated and shrink when cooled, if it's tough to turn, unscrew the screw nut for fixing switch, preventing excessive strength breaking the condensation tube.

5.2 Take three groups of water hoses for cooling is a must, to prevent ether from volatilization.

5.3 Set up extraction and heating temperatures in accordance with room temperature.

5.4 If use water bath to heat, distilled water must be poured into in advance, to protect heating tube from being broken, also for this reason, please notice water level when extracting, add distilled water in time when water level is low.

5.5 If the apparatus uses electric hot plate to heat, make the bottom of extraction cylinder fully contact with the plate, to avoid slow heating;

5.6 Under conditions of complying with regulations for transportation, storage, installation and usage, if the apparatus malfunctions for sake of manufacturing reasons within one year from the day of receiving, or when opening packing box, there are shortage, broken places

because of bad package, accessories not in compliance with packing list, please contact with our customer service dept..

5.7 The apparatus enjoys lifetime warranty, if there is any problem, users can contact our customer service dept. directly.

Oil Content and Infusion, Extraction Timetable

Unit:hour

oil content	infusion	extraction
0.5~5%	0.5	1
5~15%	1	1
15~25%	1	1.5
25~35%	1.5	1.5
35~45%	2.5	2
45~60%	3	2.5

6. Packaging list

No.	Items	Specification	Quantity
1	Fat Analyzerr	main machine	1
2	power cable 250V/10A	meter	1
3	Fuse Tube 5A	piece	2
5	6*11mm rubber hose	meter	6
6	hanging basket	piece	6
7	extraction bottle	piece	6
8	Operation Instruction	copy	1

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