

Graphite Digestion System

ECOPRE™
BaekDu™



CUSTOMER CENTER TEL.82-2-809-7847,82-2-809-7848 www.odlab.co.kr



About **ODLAB**



ODLAB has been manufacturing Graphite Digestion System including EcoPre hotplates, Graphite blocks and BaekDu™ Teflon digestion vessels and we also have been providing Certified Reference Materials(CRMs) and consumables for AAS, ICP, ICP-MS since August 2008.

In order to improve on previous hotplates and digestion vessels, we have developed our own Graphite Digestion System. We recommend our products for companies which have much trouble with getting an accurate data due to corrosion of the fume hood or hotplate or pollution of existing products in a harsh laboratory environment. It is possible to prevent

heavy metal pollution using graphite instead of aluminum.

Furthermore, BaekDu™ is Teflon coated to resist a corrosive attack for guaranteed long life and protect an analyst from harmful gas.

ODLAB is very proud that we have developed and commercialized high quality products such as BaekDu™ Teflon digestion vessels and Pressure digestion vessels for the first time in the world and obtained international patents in Korea, China, Canada, Germany, U.K., U.S.A., and so on.

Sincerely,
CEO Young Rok Eum

Graphite Digestion System



- Up to 250 °C temperature control (200~240V)

Graphite Blocks

- Teflon coated blocks to resist corrosion
- User friendly custom-made blocks

BaekDu™ Teflon Digestion Vessels

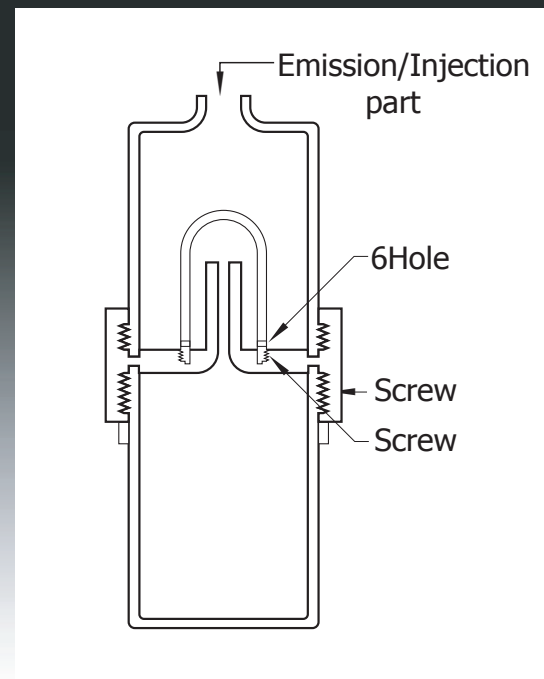
- Patent rights in 7 countries.
- Dupont's 440HP high purity material
- Support 60ml, 100ml, and 300ml
- Collect volatile elements and acid

BaekDu™ Digestion Vessels



Design

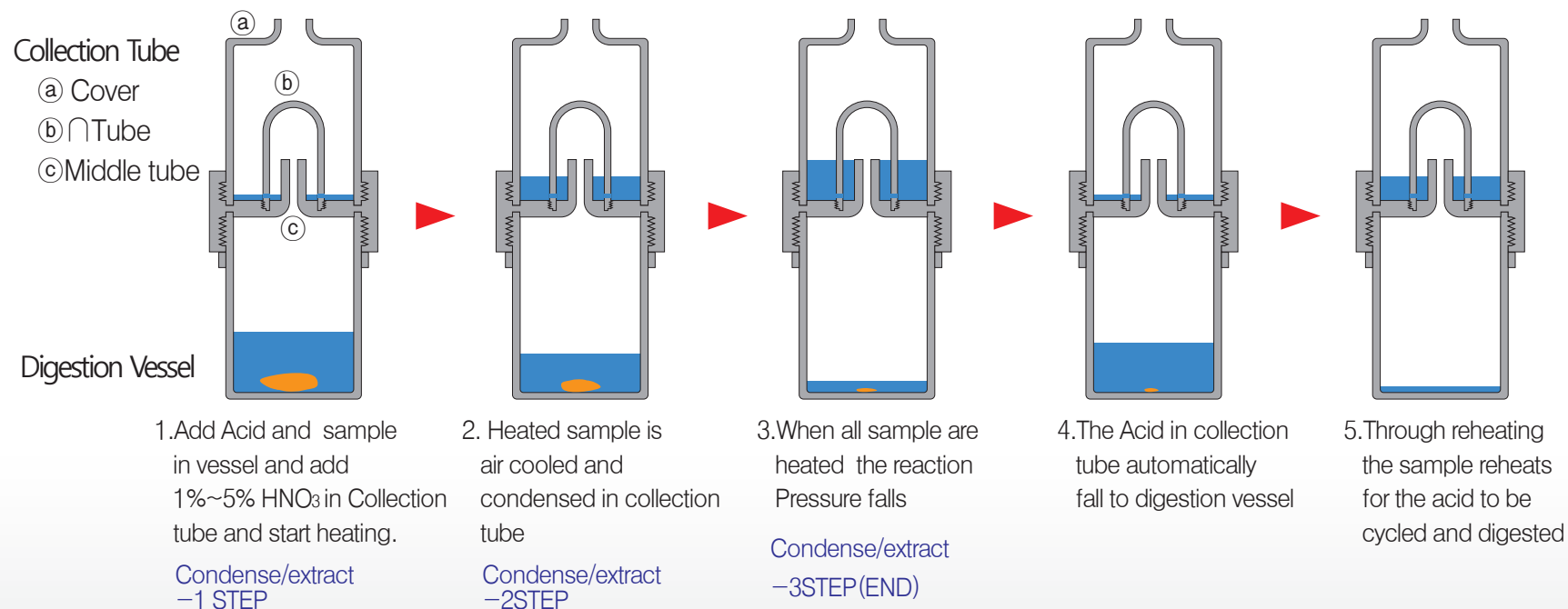
A high purity PFA Teflon digestion vessel is comprised of Digestion vessel and Collection tube. When the vapor from Digestion vessel passes reversed U-tube, the vapor is air-cooled and condensed and the gas is emitted to the highest part of the Collection tube. Each part is designed to be tightened by turning screws to maintain the reacting pressure.



Features

- Made of the 440HP PFA Teflon material produced by DuPont. in the U.S.A.
- Heated up to approximately 260 °C in the continuous temperature.
- Digested by recycling after adding acid once.
- Collect and digest volatile elements like Hg, As, B by Collection tube.
- Protect an analyst from harmful gas generated by pre-treatment and extend the life of the fume hood in a lab.
- Used longer time than glass tubes and saved experimental cost.

BaekDu™ Digestion Vessels



Sequential Processing

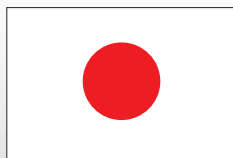
After heating is started, heated acid gas passes the reversed U-tube. Acid gas meets cold air to be air-cooled and condensed and then it is accumulated in the collection tube. Once all acid in the digestion vessel moves up to the collection tube, reacting pressure gets lower and the liquid in the collection tube starts to drop to the digestion vessel. This processing is repeated by reheating until the sample decomposition is completed.

Patents for BaekDu™ Digestion Vessels



What does BaekDu™ mean?

The highest and most famous mountain in Korea is Mt. Baekdu. It is located on the border between Korea and China. There are the crystal clear blue lake in the center of the top and beautiful plants and various animals are living peacefully. We thought our product, Teflon Digestion vessel looks like Mt. Baekdu so we named it BaekDu.



Japan



Canada



China



Germany



India



U.S.A



U.K.

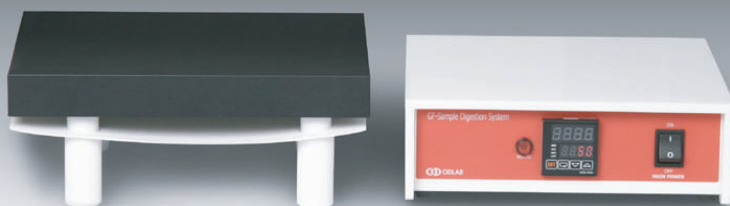


Korea

Products **ECOPRE series**

ECOPRE-I

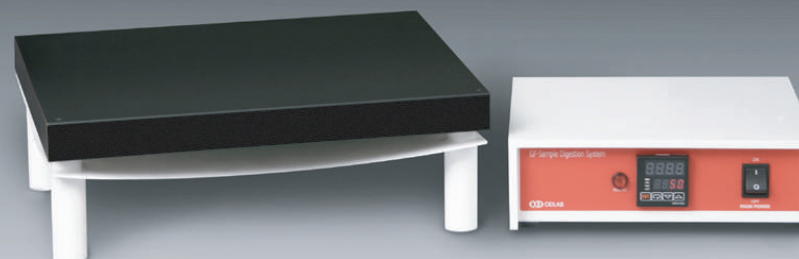
No: OD-98-001



- Size(mm): 300W x 210L x 35H
- Temperature : Up to 250°C
- Teflon Coated Graphite

ECOPRE-II

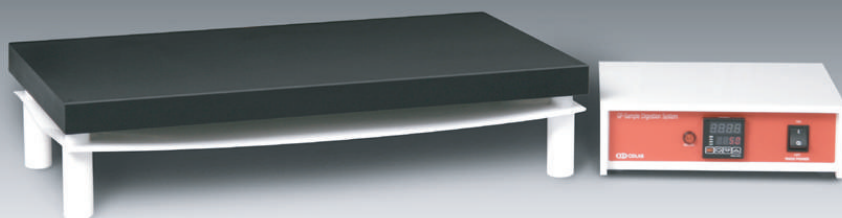
No: OD-98-002



- Size(mm): 400W x 300L x 35H
- Temperature : Up to 250°C
- Teflon Coated Graphite

ECOPRE-III

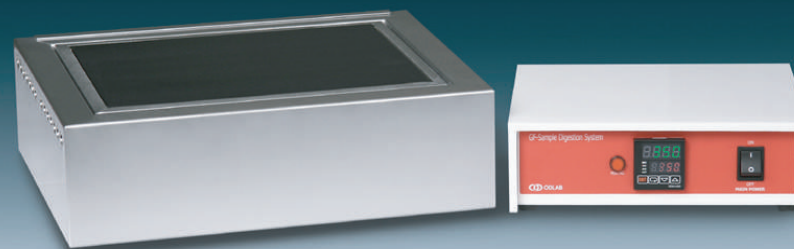
No: OD-98-003



- Size(mm): 600W x 300L x 35H
- Temperature : Up to 250°C
- Teflon Coated Graphite

ECOPRE-HT

No: OD-98-004



- Size(mm): 300W x 230L x 35H
- Temperature : Up to 500°C
- Special Coated Graphite

Products **ECOPRE series**



New concept programming controller special features of products

1. Disassemble method can be saved match to the sample.
2. Disassemble method can be saved without limitation. Saved disassemble method can't be used again.
3. Temperature and time input function is repeatedly and it can be set up. Easily
4. Test data can't be copied by USB. and used practically.

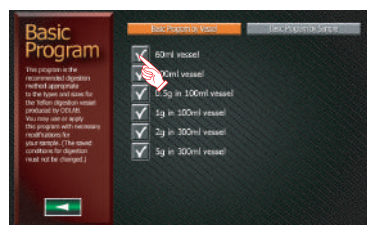
- Product Number: OD-98-LCD
- Screen : 7 Inch TFT Touch Screen LCD.
- SIZE : W215xD250xH140
- Quality of material: resistance to flame A



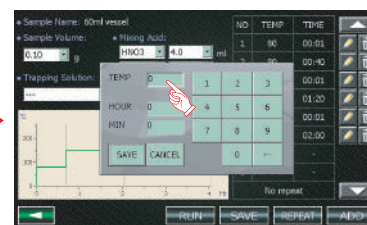
Selecting instrument after Loading. Home screen.
(After loading, the last screen which has been used at the last time is displayed)



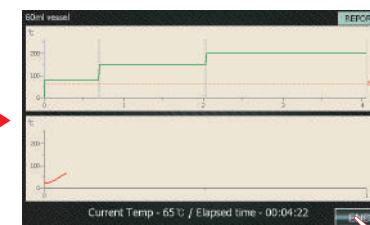
Program entering and machine set up information can be entered at this screen.



Basic saved method and the method has been saved by the user are able to be selected.

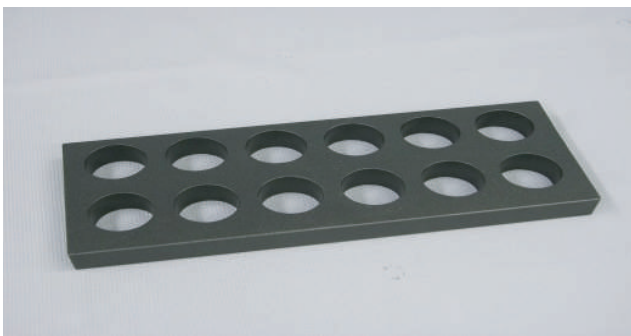


Using the function of repeatedly can be saved in the repeated section.



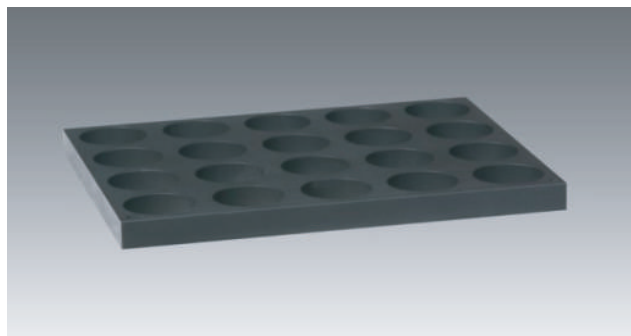
Entering the conditions of the upper shelf, the bottom graph has been marked through temperature and elapse time. Current temperature and elapse time can be seen by numbers.

Products **ECOPRE series**



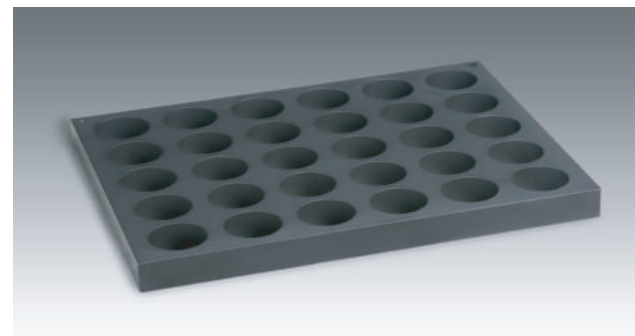
Graphite Block (Narrow)

- No : OD-98-12Holes
- Size(mm) : 400W x 150L x 30H
- Teflon Coated



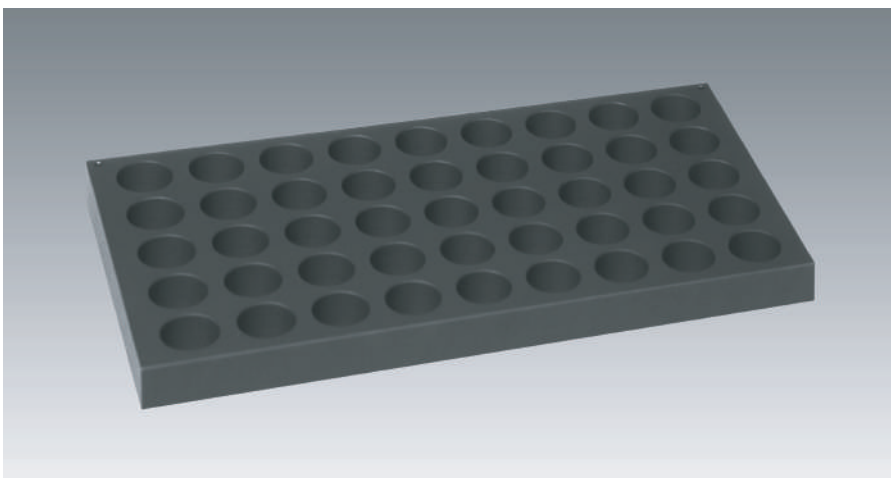
Graphite Block (Small)

- No: OD-98-15Holes
- Size(mm): 300W x 210L x 30H
- Teflon Coated



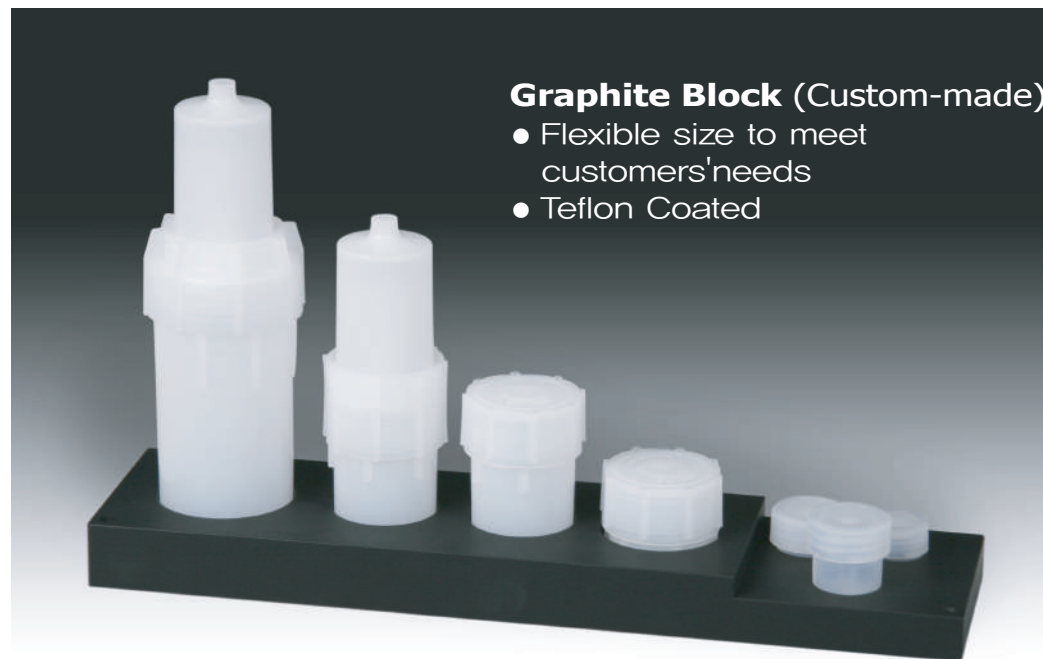
Graphite Block (Medium)

- No: OD-98-24 Holes
- Size(mm): 400W x 300L x 30H
- Teflon Coated



Graphite Block (Large)

- No: OD-98-45 Holes
- Size(mm): 600W x 300L x 30H
- Teflon Coated



Graphite Block (Custom-made)

- Flexible size to meet customers' needs
- Teflon Coated

Products **Digestion Teflon Vessels**



BaekDu™ Digestion Teflon Vessel Size

- 300ml : OD-98-300
- 100ml : OD-98-100
- 60ml : OD-98-60



Pressure Digestion Teflon Vessel Size

- 100ml : OD-98-100P
- 60ml : OD-98-60P
- 30ml : OD-98-30P
- 15ml : OD-98-15P

BaekDu™ Digestion Teflon Vessel

- Size: 60ml or 100ml



BaekDu™ Digestion Teflon Vessel

- Size: 300ml



Pressure Digestion Teflon Vessel

- Size: 15ml, 30ml, 60ml and 100ml
- Pressured digestion by 75psi
- Appropriate to bio samples or micro size analysis
- Digestion without loss for volatile elements



Products Accessories



Wrench

- No: OD-Wrench-S(B)
- To open and close Pressure Digestion vessels for 60ml, 100ml or Digestion vessels for 300ml



Brush for cleaning vessels

- No: OD-98-Cleaner
- Size: 18cm
- Sponge and Plastic
- To clean Teflon digestion vessels



Teflon only pen

- No: OD-98-PEN
- Only Teflon pen is available to mark on the Teflon digestion vessels



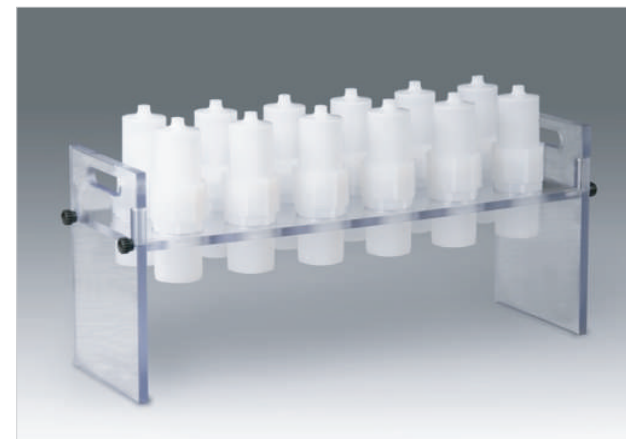
Filter Paper

- No: OD-98-FM (for Ø37 Heavy metal)
- OD-98-FCR (for Ø37 Chromium VI)
- Qty.: 100EA/Box



Filter Manifold

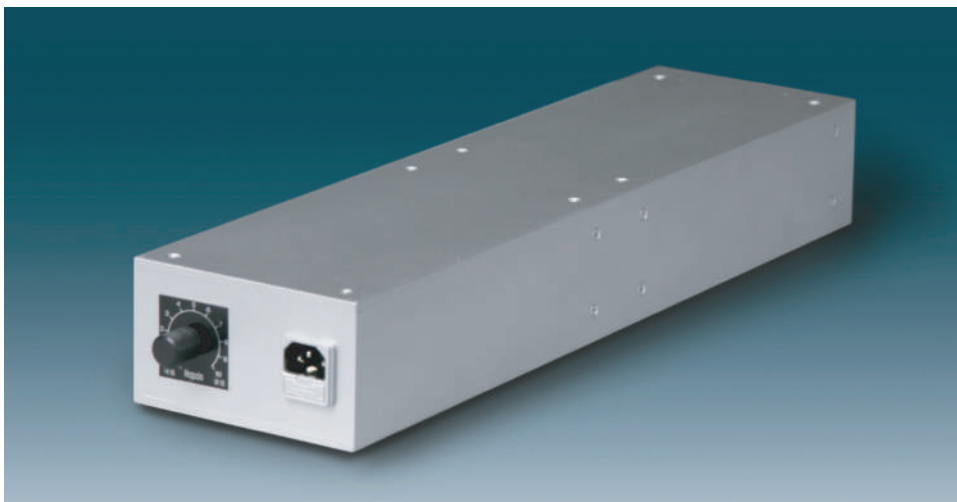
- No: OD-98-Manifold
- Size: 8 Valves to open and close
- No corrosion with plastic material
- Used with a vacuum pump for filtering



Rack

- No: OD-98-RACK
- Size: 12 Holes
- Poly Carbonated material
- Height adjustment possible
- To transport vessels or use for filtering a sample

Products **Magnetic Stirrer**



Stirrer

- No: OD-98-Stirrer (Same as below)
- Built-in controller
- Plastic material to prevent corrosion
- Available to control speed of motor



Teflon Bar

- No: OD-98-Bar
- Size(mm): 15x4
- Teflon coated circle bar for the Teflon digestion vessel, BaekDu™



Hotplate and Stirrer

- No: OD-98 Stirrer
- Size(mm): 400x120
- Installed below Graphite hotplate

Products **Teflon Cleaner & Gas Neutralizer**



Graphite Teflon Cleaner

- No: OD-98-GTC
- Size: Graphite (340x70) & Teflon Tank (320x360)
- To clean various kinds of vessels adding diluted acid
- Diluted acid can be recycled



Neutralizer of Harmful Gas

- No: OD-98-HGN
- Size: 350x370x400
- Voltage : AC220V, 50/60Hz
- Neutralized by H_2O and $NaOH$



Clean Fume hood

- No: OD-98-CH
- Size (mm) : 1200 or 1500 or 1800
- No corrosion with tempered PVC material
- Safe from harmful gas or acid vapor



Teflon Gas Collection Plate

- No: OD-98-CP
- Size: 450x350
- Made by heated PTFE
- 24 holes are sending harmful gas from Digestion vessel to Neutralizer

Application

1. Condition of Digestion - Soil (by DIN ISO11466)

- 1.5g : Add HNO_3 3.5ml and HCl 10.5ml to Digestion vessel
3g : Add HNO_3 7ml and HCl 21ml to Digestion vessel
- Insert 0.5M HNO_3 7.5ml into Collection tube
- After adding Acid, let stand at room temperature for 2 hours



Insert 1.5g or 3g of the sample into Digestion vessel

Digest at 130°C for 2 hours

After cooling, move remained liquid in Collection tube to Digestion vessel. Clean Collection tube using distilled water and move it to Digestion vessel, too

Mass-up (1.5g to 50ml, 3g to 100ml)/ Filtering (OD-98-FM)/Measure

Clean up Digestion vessel using a detergent and then make a cleansing solution at the rate of distilled water 7: HNO_3 2: HCl 1 and heat them up

Application

2. Condition of Digestion-Dried Shrimp(available to similar samples)

Insert 1g of the sample into Digestion vessel

Heating at 220°C and temperature down to 150°C(Repeat this step three times)

Use HCl if the sample includes lots of Ca like an anchovy because sulfuric acid may cause precipitate

Analyze 50ml mass-up

- Add HNO₃ 15ml, HCl 3ml, and Perchloric acid 0.5ml to Digestion vessel
- Insert 1% HNO₃ 6ml into Collection tube



Application

3. Condition of Digestion - Chrome VI(EPA-3060A)

- Dilute NaOH 20g and Na₂CO₃ 30g with 1L distilled water to make the digestion solution
- Add 50ml digestion solution heated to 90°C~95°C
- Add MgCl₂ 0.4g
- Add 0.1M Phosphate buffer 0.5mL

- Control PH7.5 ± 0.5 using 5M HNO₃
(Digest again if the range is out of PH7.5 ± 0.5)
- Clean up Digestion vessel using distilled water

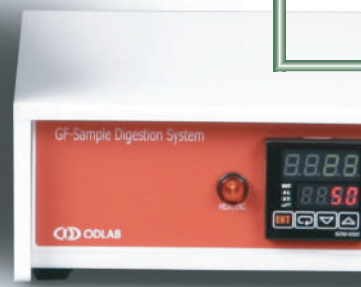
Insert 2.5g of the sample into Digestion vessel

Cover the collection tube with a watch glass and stir for 5 min.

Heat up to 90°C ~95°C and stir for 60 min.

Cool at room temperature and filter (OD-98-FCR)

Analyze 100ml mass-up UV



Application

4. Condition of Digestion-Sludge, Precipitate

- Add HNO_3 4ml, Hydrofluoric acid 3ml, and Perchloric acid 1ml to Pressure vessel
- Keep uncovered and Heat to 100°C for about 40 minutes

- If digestion is not completed, digest again adding HNO_3 3ml, Hydrofluoric acid 1ml

Insert 0.2g of the sample into Pressure vessel

Close the cover of Pressure vessel using a wrench and heat up to 200°C for 5 hours.
Dry up at 100°C after cooling

Mass-up / Filtering (If necessary)/ Measure

Clean up Pressure vessel using a detergent and then make the cleansing solution 20ml at the rate of distilled water 6 : HNO_3 2 : HF 2 and heat them up



Products Available Consumables



CRM Supplies

- Provide Certified Reference Materials domestically and internationally such as RoHS related standard substance, soil, bio, water, metal, and so on



Standard Solution

- Single element, multi elements solution, Oil standard solution for AAS, ICP, ICP-MS, IC, or XRF
- Can be Custom-made



High purity/Ultra high purity Acid

- Recommended for micro analysis such as ICP-MS or GF-AAS
- Supplied by 100ppt and 10ppt



TruFlo Sample Monitor

- Accuracy improvement for ICP-OES and ICP-MS test
- Reduces sample repeats and sounds out-of-range alarm



Bottle Top Dispenser

- Dispensing small volumes of high purity acids from a bottle safely and reliably
- Convenient and safe traditional bottle-top pump style

Products Available Machines



SpectroMill

- SpectroMill Ball Pestle Impact Grinders for grinding and blending XRF samples
- Process single or multiple samples at the same time
- Programmable timer with LCD display



ISOMIST

- The ultimate spray chamber for ICP-MS and ICP-OES
- Programmable temperature between -10°C and +60°C
- Reduced oxide interfaces in ICP-MS



Laboratory Press PE-MAN

- Compact sized machine for X-ray and IR sample pelletizing
- Covered in solid steel housing to save maintenance cost

Desktop Swing Mill HK40

- Product for effective grinding or mineral based samples
- Size(mm): 345x295x540
- Compact size including emergency shutdown function



User List

- 
- A stylized world map in light blue, centered on the Atlantic Ocean, set against a dark blue background with a grid of latitude and longitude lines.
- College of Agriculture and Life Science in Seoul National University
 - Korea Coast Guard R&D Center and branches
 - Gangwondo Agricultural Research and Extension Services
 - NAQS, National Agricultural Products Quality Management Service in Gangwon-Do
 - KBSI, Korea Basic Science Institute
 - NVRQS, National Veterinary Research & Quarantine Service
 - Animal and Plant Quarantine Agency
 - RIST, Research Institute of Industrial Science & Technology

- National Institute of Environmental Research
- Samsung Engineering
- National Academy of Agricultural Science
- Ministry of Food and Drug Safety
- Forestry Comprehensive Research Center in Japan
- 東レテクノ(株), TORAY Innovation by Chemistry in Japan
- (株)住化分析センタ, SCAS, Ltd. in Japan
- (株)明治, Showa Giken Industrial Co., Ltd. In Japan
- And other 300 companies

Order Information / Sales Policy

- ODLAB could deliver the products within 1~5 weeks after checking your deposit.
 - Please send the purchase order by fax or E-mail.
 - The freight charges and taxes should be paid by the customer.
 - There will be an additional 30US\$ fee for the handling charge.
 - ODLAB Graphite Digestion System products are guaranteed free of charge for one year, However, the company can not accept liability for any damages caused by natural disasters or customers' fault.
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- Address : 632, Kwang Myung Industrial Complex, 201, Haan3-dong, Kwang Myung-si, KyungGi-do, Republic of Korea (zip: 423-754)
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