

# Test Report



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Report No. A2230163012101003

Company Name shown on Report MITSUI HIGH-TEC INC.

Address 10-1, KOMINE2-CHOME, YAHATANISHIKU KITAKYUSHU, 807-8588, JAPAN

The following sample(s) and sample information was/were submitted and identified by/on the behalf of the applicant

Sample Name Pd plating  
Sample Received Date Apr. 13, 2023  
Testing Period Apr. 13, 2023 to Apr. 19, 2023

**Test Requested** As specified by client, to test Lead (Pb), Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr(VI)), Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs), Phthalates (DBP, BBP, DEHP, DIBP), Fluorine (F), Chlorine (Cl), Bromine (Br) Iodine (I), Phthalates, Organotin compounds, Antimony(Sb), Hexabromocyclododecane (HBCDD), Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA), Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs), Polyvinyl Chloride (PVC), Short Chain Chlorinated Paraffins (SCCPs) in the submitted sample(s).

**Test Method** Please refer to the following page(s).

**Test Result(s)** Please refer to the following page(s).



*George Fong*

Laboratory Manager

Date

Apr. 19, 2023

No. R392331204

Testing Center, Centre Testing International (Taiwan) Co., Ltd.

5F-6, No.9, Sec.2, Nankan Rd, Luzhu Dist., Taoyuan, Taiwan

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**Test Method**

Test Item(s)	Test Method	Measured Equipment(s)
Lead (Pb)	Refer to IEC 62321-5:2013	ICP-OES
Cadmium (Cd)	Refer to IEC 62321-5:2013	ICP-OES
Mercury (Hg)	Refer to IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS
Fluorine (F)	Refer to EN 14582:2016	IC
Chlorine (Cl)	Refer to EN 14582:2016	IC
Bromine (Br)	Refer to EN 14582:2016	IC
Iodine (I)	Refer to EN 14582:2016	IC
Phthalates	IEC 62321-8:2017	GC-MS
Organotin compounds	Refer to US EPA 3550C:2007 & ISO 17353:2004	GC-MS
Short Chain Chlorinated Paraffins (SCCPs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS(NCI)
Polychlorinated Naphthalenes (PCNs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
Polychlorinated Biphenyls(PCBs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
Polychlorinated terphenyls (PCTs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
Polyvinyl Chloride (PVC)	Refer to JY/T 001-1996	FT-IR
Hexabromocyclododecane (HBCDD)	IEC 62321-9:2021	GC-MS
Perfluorooctanoic Acid(PFOA)	Refer to DIN CEN/TS 15968:2010	LC-MS-MS
Perfluorooctane Sulfonates(PFOS)	Refer to DIN CEN/TS 15968:2010	LC-MS-MS
Antimony(Sb)	Refer to US EPA 3050B:1996 & US EPA 6010D:2018	ICP-OES

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**Test Result(s)**

Tested Item(s)	Result	MDL
	003	
Lead (Pb)	N.D.	2 mg/kg
Cadmium (Cd)	N.D.	2 mg/kg
Mercury (Hg)	N.D.	2 mg/kg
Hexavalent Chromium (Cr(VI))	N.D. ▼	0.10 µg/cm² (LOQ)

Tested Item(s)	Result	MDL
	003	
Polybrominated Biphenyls (PBBs)		
Monobromobiphenyl	N.D.	5 mg/kg
Dibromobiphenyl	N.D.	5 mg/kg
Tribromobiphenyl	N.D.	5 mg/kg
Tetrabromobiphenyl	N.D.	5 mg/kg
Pentabromobiphenyl	N.D.	5 mg/kg
Hexabromobiphenyl	N.D.	5 mg/kg
Heptabromobiphenyl	N.D.	5 mg/kg
Octabromobiphenyl	N.D.	5 mg/kg
Nonabromobiphenyl	N.D.	5 mg/kg
Decabromobiphenyl	N.D.	5 mg/kg

Tested Item(s)	Result	MDL
	003	
Polybrominated Diphenyl Ethers (PBDEs)		
Monobromodiphenyl ether	N.D.	5 mg/kg
Dibromodiphenyl ether	N.D.	5 mg/kg
Tribromodiphenyl ether	N.D.	5 mg/kg
Tetrabromodiphenyl ether	N.D.	5 mg/kg
Pentabromodiphenyl ether	N.D.	5 mg/kg
Hexabromodiphenyl ether	N.D.	5 mg/kg
Heptabromodiphenyl ether	N.D.	5 mg/kg
Octabromodiphenyl ether	N.D.	5 mg/kg
Nonabromodiphenyl ether	N.D.	5 mg/kg
Decabromodiphenyl ether	N.D.	5 mg/kg

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**Test Result(s)**

Tested Item(s)	Result	MDL
	003	
Phthalates (DBP, BBP, DEHP, DIBP)		
Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg
Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg
Tested Item(s)	Result	MDL
	003	
Fluorine (F)	N.D.	50 mg/kg
Chlorine (Cl)	N.D.	50 mg/kg
Bromine (Br)	N.D.	50 mg/kg
Iodine (I)	N.D.	50 mg/kg
Tested Item(s)	Result	MDL
	003	
Phthalates		
Bis(2-methoxyethyl) phthalate (DMEP) CAS#:117-82-8	N.D.	50 mg/kg
Di-n-hexyl phthalate (DNHP/DHEXP) CAS#:84-75-3	N.D.	50 mg/kg
Di-iso-decyl phthalate (DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-n-octyl phthalate (DNOP) CAS#:117-84-0	N.D.	50 mg/kg
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) CAS#:71888-89-6	N.D.	50 mg/kg
1,2-Benzenedicarboxylic acid, di-(C7-11)-branched and linear alkyl esters (DHNUP) CAS#:68515-42-4	N.D.	50 mg/kg

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**Test Result(s)**

Tested Item(s)	Result	MDL
	003	
Organotin compounds		
Dibutyltin (DBT)	N.D.	5 mg/kg
Dioctyltin (DOT)	N.D.	5 mg/kg
Tributyltin (TBT)	N.D.	5 mg/kg
Triphenyltin (TPHT)	N.D.	5 mg/kg
Tributyltin oxide (TBTO)*	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
	003	
Antimony (Sb)	N.D.	10 mg/kg
Tested Item(s)	Result	MDL
	003	
Polychlorinated Biphenyls(PCBs)		
Monochlorobiphenyl	N.D.	5 mg/kg
Dichlorobiphenyl	N.D.	5 mg/kg
Trichlorobiphenyl	N.D.	5 mg/kg
Tetrachlorobiphenyl	N.D.	5 mg/kg
Pentachlorobiphenyl	N.D.	5 mg/kg
Hexachlorobiphenyl	N.D.	5 mg/kg
Heptachlorobiphenyl	N.D.	5 mg/kg
Octachlorobiphenyl	N.D.	5 mg/kg
Nonachlorobiphenyl	N.D.	5 mg/kg
Decachlorobiphenyl	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
	003	
Short Chain Chlorinated Paraffins (SCCPs)	N.D.	50 mg/kg
Tested Item(s)	Result	MDL
	003	
Polyvinyl Chloride (PVC)	Negative	/
Tested Item(s)	Result	MDL
	003	
Perfluorooctanoic Acid (PFOA)	N.D.	0.01 mg/kg
Tested Item(s)	Result	MDL
	003	
Perfluorooctane Sulfonates (PFOS)	N.D.	0.01 mg/kg

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**Test Result(s)**

Tested Item(s)	Result	MDL
	003	
Polychlorinated Triphenyls (PCTs)	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
	003	
Hexabromocyclododecane (HBCDD)	N.D.	20 mg/kg
Tested Item(s)	Result	MDL
	003	
Polychlorinated Naphthalenes (PCNs)	N.D.	5 mg/kg

**Sample/Part Description**

No.	CTI Sample ID	Description
1	003	Iron gray plating

**Remark:** The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury, Antimony.

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL or LOQ)

-mg/kg = ppm = parts per million

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 µg/cm<sup>2</sup>

-The sample is negative for Cr(VI) – The Cr(VI) concentration is below 0.10 µg/cm<sup>2</sup>.

The coating is considered a non-Cr(VI) based coating.

-Negative = Not contained Polyvinyl Chloride(PVC)

-\*=Concentration value of Tributyltin oxide by the conversion from the test results of Tributyl Tins.

**Note:** The testing data and result(s) in this report is(are) just for scientific research, education, internal quality control and product development etc.

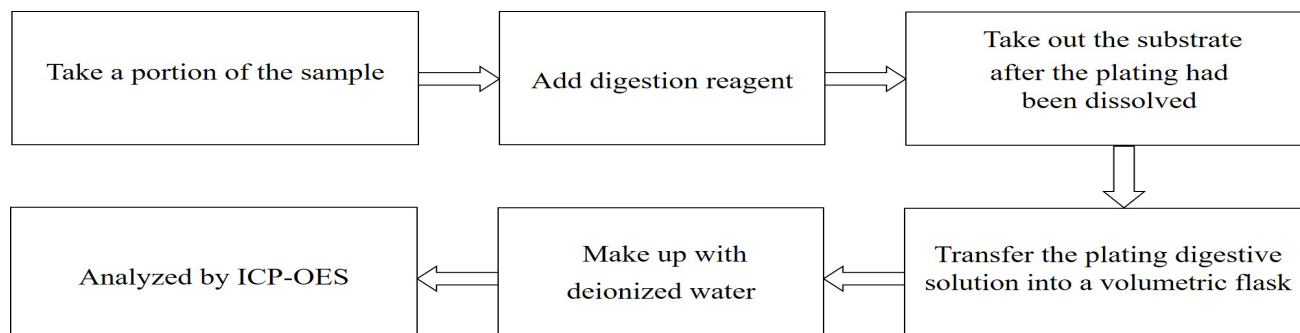
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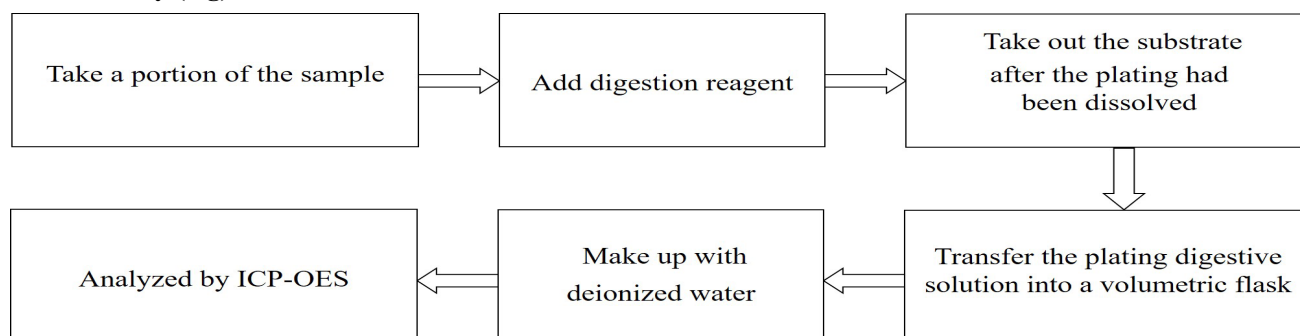
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## Test Process

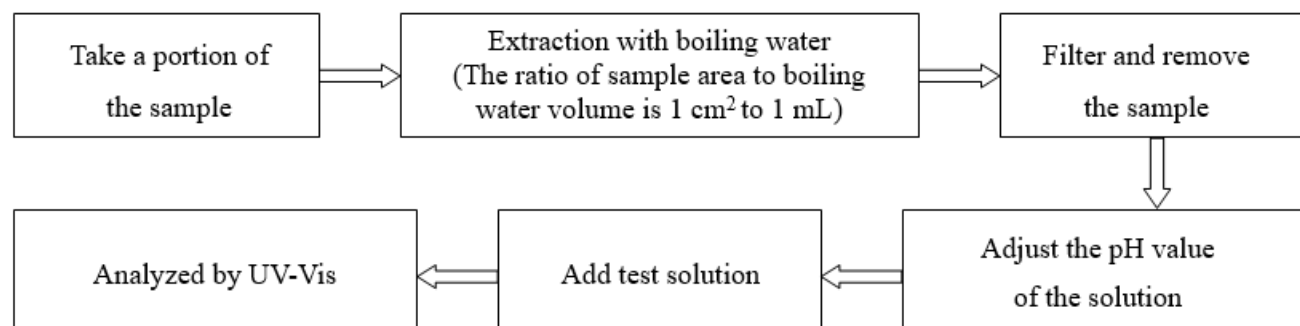
### 1. Lead (Pb), Cadmium (Cd)



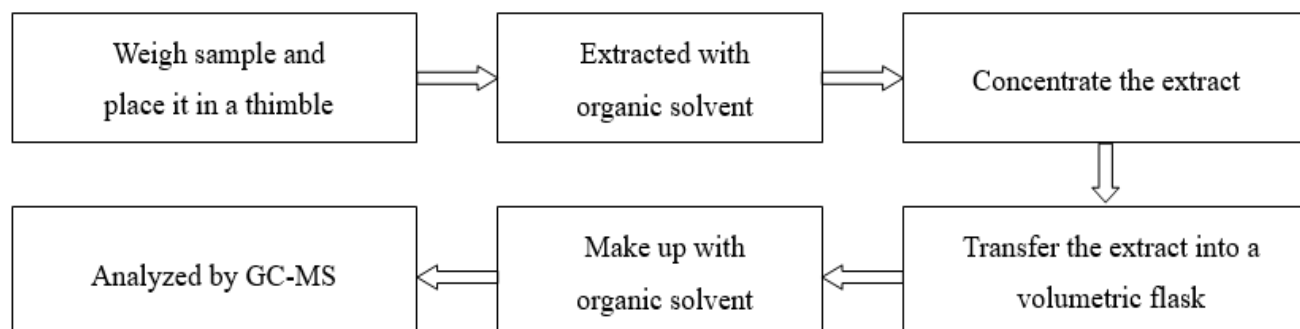
### 2. Mercury (Hg)



### 3. Hexavalent Chromium (Cr(VI))



### 4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)

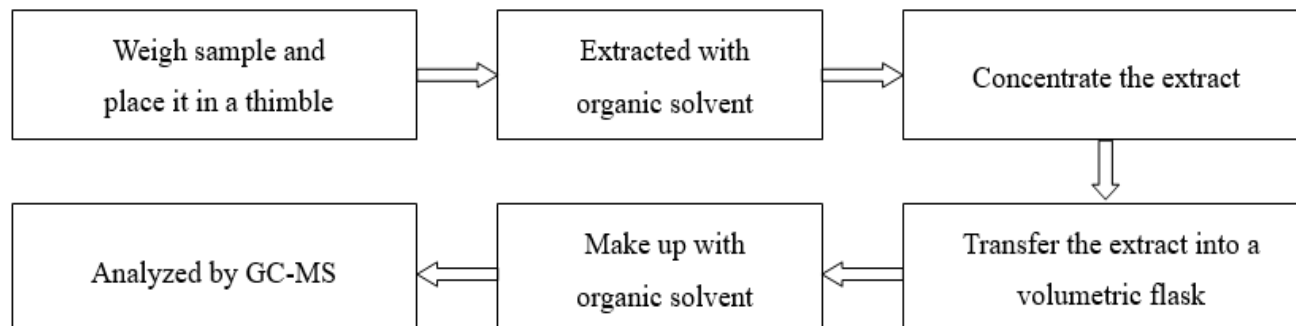


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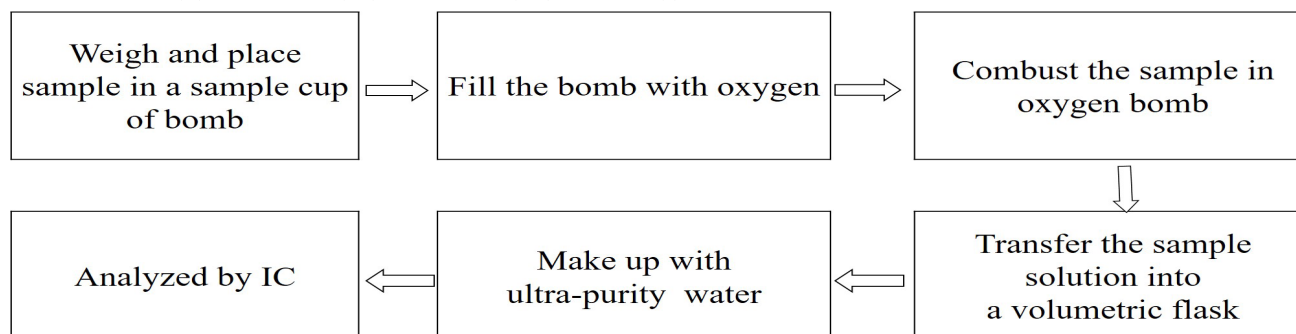
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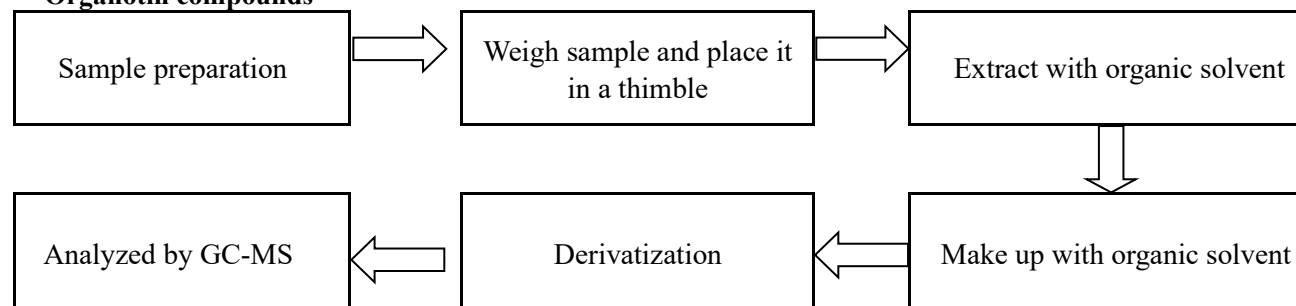
## 5. Phthalates (DBP, BBP, DEHP, DIBP), Phthalates



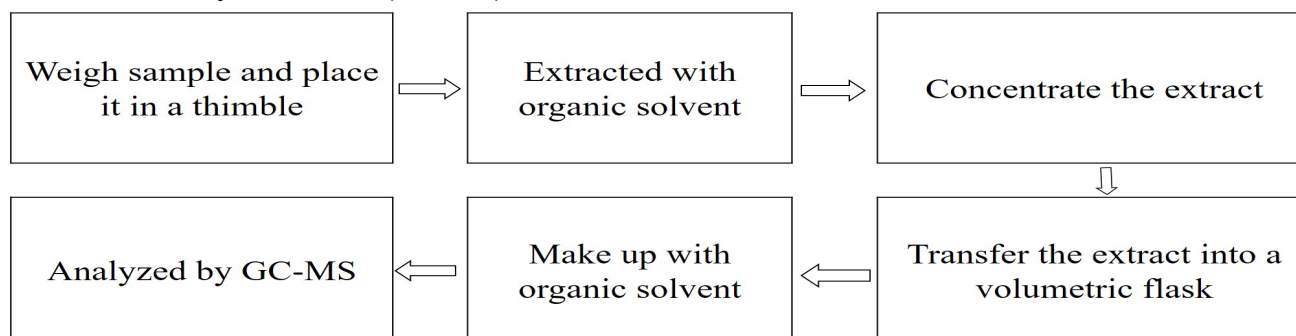
## 6. Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)



## 7. Organotin compounds



## 8. Hexabromocyclododecane (HBCDD)



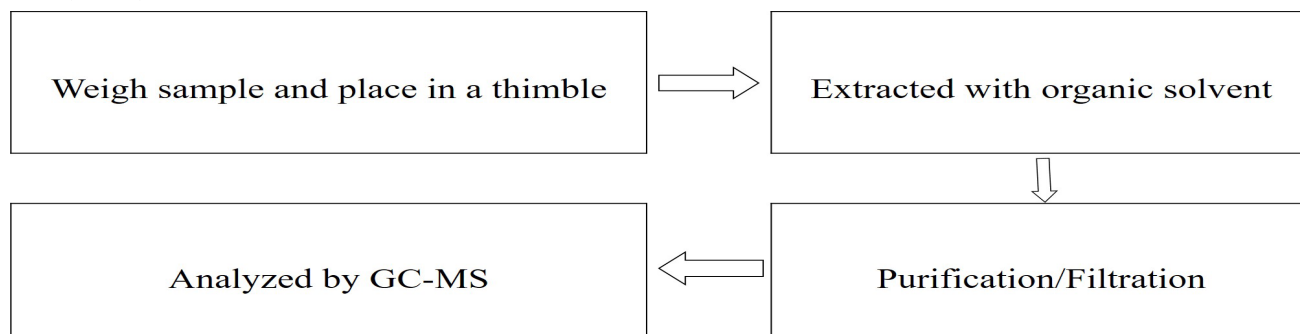


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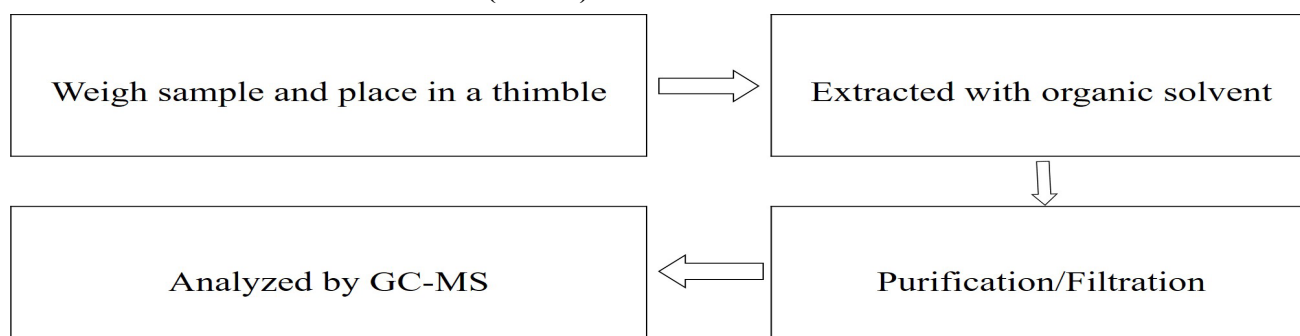
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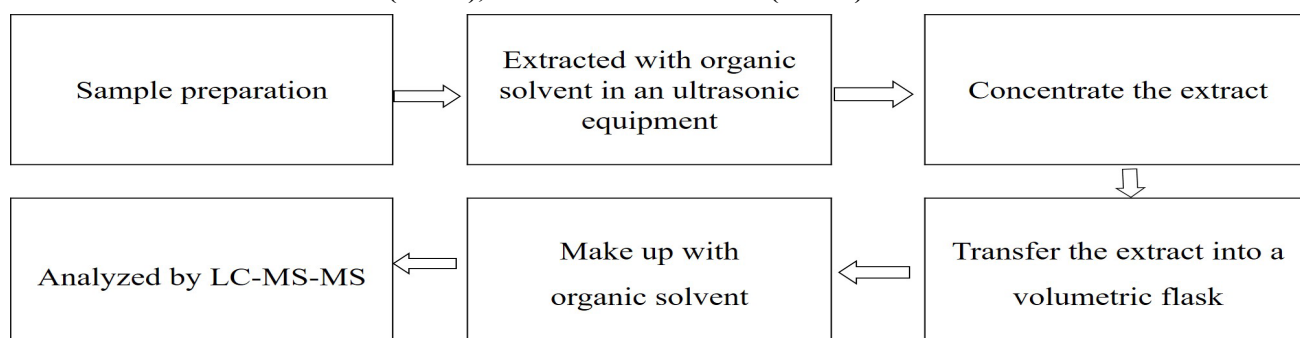
## 9. Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs)



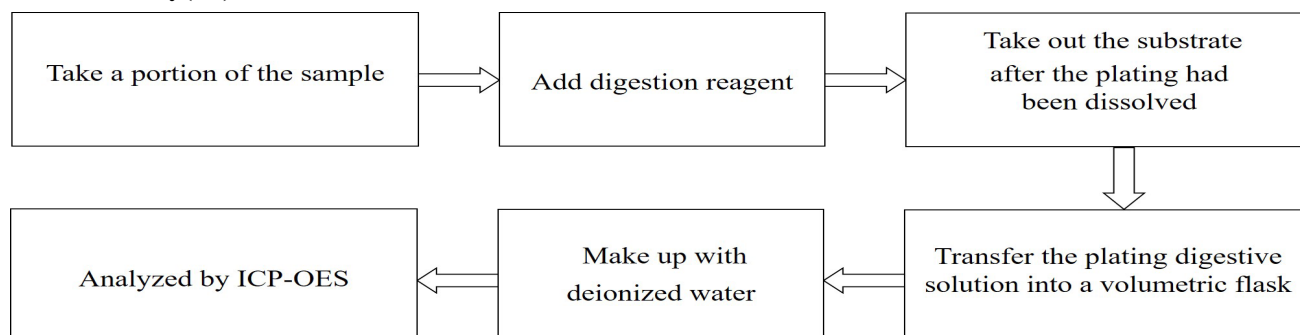
## 10. Short Chain Chlorinated Paraffins (SCCPs)



## 11. Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA)



## 12. Antimony(Sb)

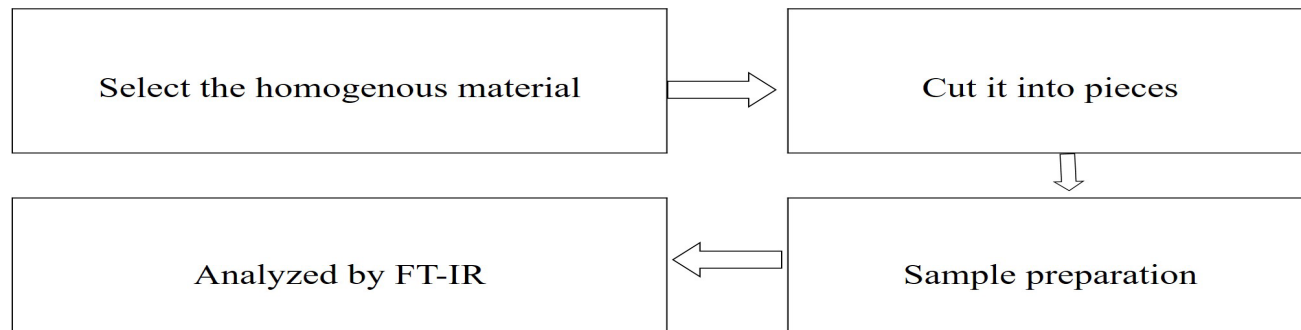


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## 13. Polyvinyl Chloride (PVC)

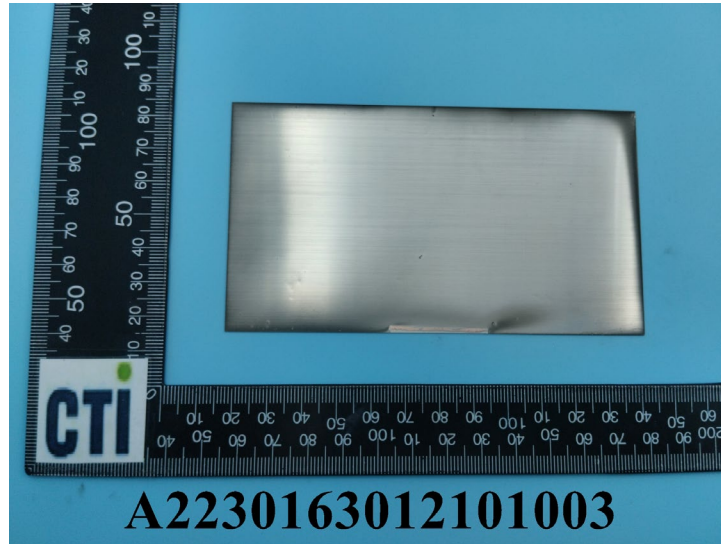


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## Photo(s) of the sample(s)



### Statement:

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Without written approval of CTI, this report can't be reproduced except in full;
5. In case of any discrepancy between the English version and Chinese version of the testing reports (if generated), the Chinese version shall prevail.

\*\*\* End of report \*\*\*