

# Test Report



**Report No.** A2220149517101003

**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. 20, 2022  
 Testing Period Apr. 20, 2022 to Apr. 29, 2022

**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), Beryllium(Be), Antimony(Sb), Hexabromocyclododecane (HBCDD), Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs), Polychlorinated Biphenyls(PCBs), Phthalates, Short Chain Chlorinated Paraffins (SCCPs), Organotin compounds, Polyvinyl Chloride (PVC), Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA) in the submitted sample(s).

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

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

\*\*\*\*\*  
**Conclusion**

Tested Sample	According to standard/directive	Result
Submitted Sample	RoHS Directive 2011/65/EU with amendment (EU) 2015/863	PASS

\*\*\*\*\*  
 PASS means that the results shown on the report comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.



Tested by Morgan Hsu

Approved by George Fong

George Fong  
 Lab Manager

Reviewed by Polly Cheng

Date May 3, 2022

No. R392331263

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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
Beryllium(Be)	Refer to US EPA 3050B:1996 & US EPA 6010D:2018*	ICP-OES
Antimony(Sb)	Refer to US EPA 3050B:1996 & US EPA 6010D:2018*	ICP-OES
Hexabromocyclododecane (HBCDD)	Refer to IEC 62321-9:2021*	GC-MS
Fluorine (F)	EN 14582:2016	IC
Chlorine (Cl)	EN 14582:2016	IC
Bromine (Br)	EN 14582:2016	IC
Iodine (I)	EN 14582:2016	IC
Polychlorinated Naphthalenes (PCNs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017*	GC-MS
Polychlorinated terphenyls (PCTs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017*	GC-MS
Polychlorinated Biphenyls(PCBs)	Refer to US EPA 3540C:1996 & US EPA 8270E:2017*	GC-MS
Perfluorooctane Sulfonates(PFOS)	Refer to CEN/TS 15968:2010*	LC-MS-MS/LC-MS
Short Chain Chlorinated Paraffins (SCCPs)	Refer to US EPA 3550C:2007 & US EPA 8270E:2017*	GC-MS(NCI)
Organotin compounds	Refer to ISO 17353:2004(E)*	GC-MS
Polyvinyl Chloride (PVC)	Refer to JY/T 001-1996*	FT-IR
Perfluorooctanoic Acid(PFOA)	Refer to CEN/TS 15968:2010*	LC-MS-MS/LC-MS
Phthalates(DMEP, DNHP, DIDP, DINP, DNOP, DIHP, DHNUP)	Refer to EN 14372:2004(E)*	GC-MS

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**Test Result(s)**

Tested Item(s)	Result	MDL	Limit
Lead(Pb)	N.D.	2 mg/kg	1000 mg/kg
Cadmium(Cd)	N.D.	2 mg/kg	100 mg/kg
Mercury(Hg)	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium(Cr(VI))	N.D. ▼	0.10 µg/cm <sup>2</sup> (LOQ)	1000 mg/kg
Tested Item(s)	Result	MDL	Limit
<b>Polybrominated Biphenyls (PBBs)</b>			
Monobromobiphenyl	N.D.	5 mg/kg	1000 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	Limit
<b>Polybrominated Diphenyl Ethers (PBDEs)</b>			
Monobromodiphenyl ether	N.D.	5 mg/kg	1000 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	Limit
<b>Phthalates (DBP, BBP, DEHP, DIBP)</b>			
Dibutyl phthalate(DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Butyl benzyl phthalate(BBP) CAS#:85-68-7	N.D.	50 mg/kg	1000 mg/kg
Di-(2-ethylhexyl) phthalate(DEHP) CAS#:117-81-7	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate(DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg
<b>Tested Item(s)</b>	<b>Result</b>	<b>MDL</b>	
Beryllium(Be)	N.D.	10 mg/kg	
Antimony(Sb)	N.D.	10 mg/kg	
<b>Tested Item(s)</b>	<b>Result</b>	<b>MDL</b>	
Hexabromocyclododecane(HBCDD)	N.D.	20 mg/kg	
<b>Tested Item(s)</b>	<b>Result</b>	<b>MDL</b>	
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	
<b>Tested Item(s)</b>	<b>Result</b>	<b>MDL</b>	
Polychlorinated Naphthalenes(PCNs)	N.D.	5 mg/kg	
<b>Tested Item(s)</b>	<b>Result</b>	<b>MDL</b>	
Polychlorinated Triphenyls(PCTs)	N.D.	5 mg/kg	

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**Test Result(s)**

Tested Item(s)	Result	MDL
<b>Phthalates</b>		
Di-n-octyl phthalate(DNOP) CAS#:117-84-0	N.D.	50 mg/kg
Di-isononyl phthalate(DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-iso-decyl phthalate(DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Di-n-hexyl phthalate(DNHP) CAS#:84-75-3	N.D.	50 mg/kg
Bis(2-methoxyethyl) phthalate(DMEP) CAS#:117-82-8	N.D.	50 mg/kg
*1,2-Benzenedicarboxylic acid, di-(C7-11)-branched and linear alkyl esters(DHNUP) CAS#:68515-42-4	N.D.	100 mg/kg
*1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich(DIHP) CAS#:71888-89-6	N.D.	100 mg/kg
<b>Tested Item(s)</b>		
<b>Result</b>		
<b>MDL</b>		
<b>Polychlorinated Biphenyls(PCBs)</b>		
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
<b>Tested Item(s)</b>		
<b>Result</b>		
<b>MDL</b>		
Short Chain Chlorinated Paraffins(SCCPs)	N.D.	100 mg/kg

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**Test Result(s)**

Tested Item(s)	Result	MDL
<b>Organotin compounds</b>		
Dibutyltin(DBT)	N.D.	5 mg/kg
Tributyltin(TBT)	N.D.	5 mg/kg
Tributyltin oxide(TBTO) *2	N.D.	5 mg/kg
Diocetyl tin(DOT)	N.D.	5 mg/kg
Triphenyltin(TPHT)	N.D.	5 mg/kg
<b>Tested Item(s)</b>		
Polyvinyl Chloride(PVC)	Negative	/
<b>Tested Item(s)</b>		
Perfluorooctanoic Acid(PFOA)	N.D.	0.01 mg/kg
<b>Tested Item(s)</b>		
Perfluorooctane Sulfonates(PFOS)	N.D.	0.01 mg/kg

**Sample/Part Description** Silvery plating

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

-MDL = Method Detection Limit

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

-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

-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)

-\*1= In view of the substances are established as UVCB substances (substances of unknown or variable composition, complex reaction products or biological materials) consisting of different and variable constituents, the test results are calculated based on the main constituents of the representative compounds for substances.

-\*2= concentration value of Tributyltin oxide by the conversion from the test results of Tributyl Tins.

**Note:** “\*” indicates the method(s) is (are) not in TAF accreditation scope.

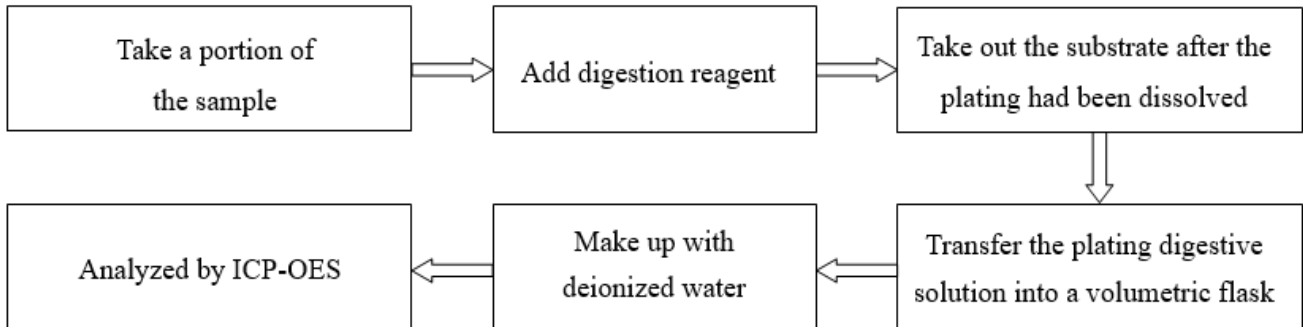
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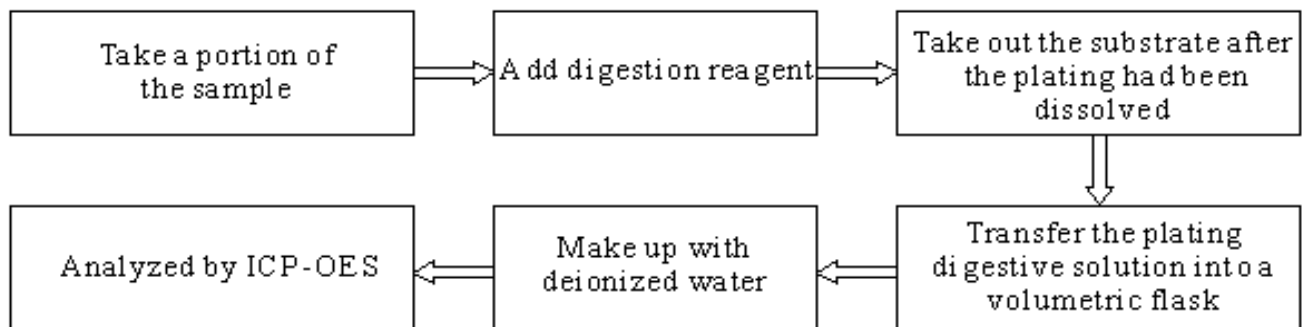
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## Test Process

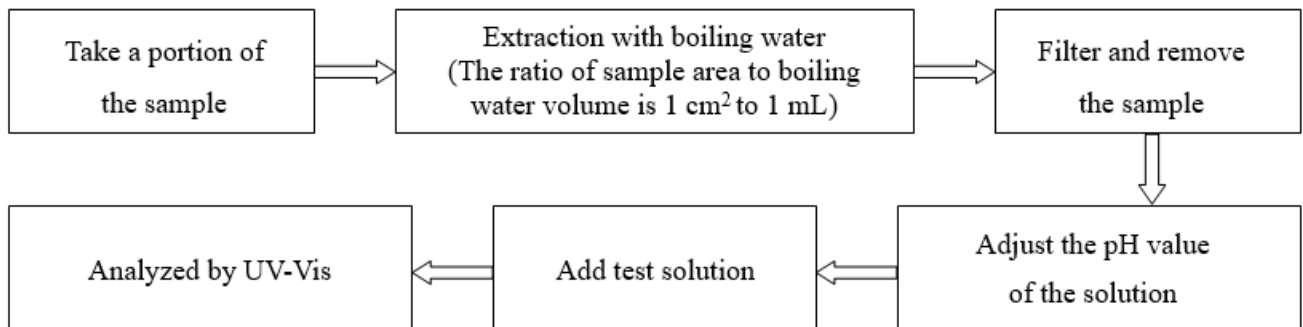
### 1. Lead (Pb), Cadmium (Cd)



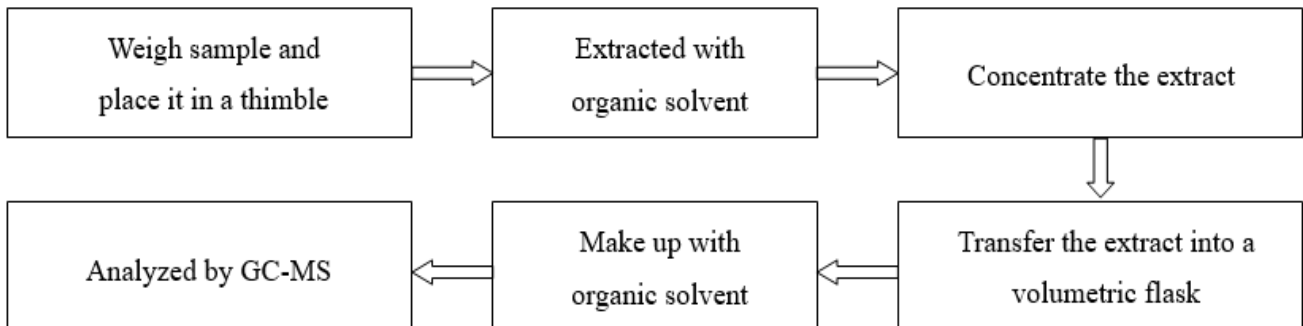
### 2. Mercury (Hg)



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



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

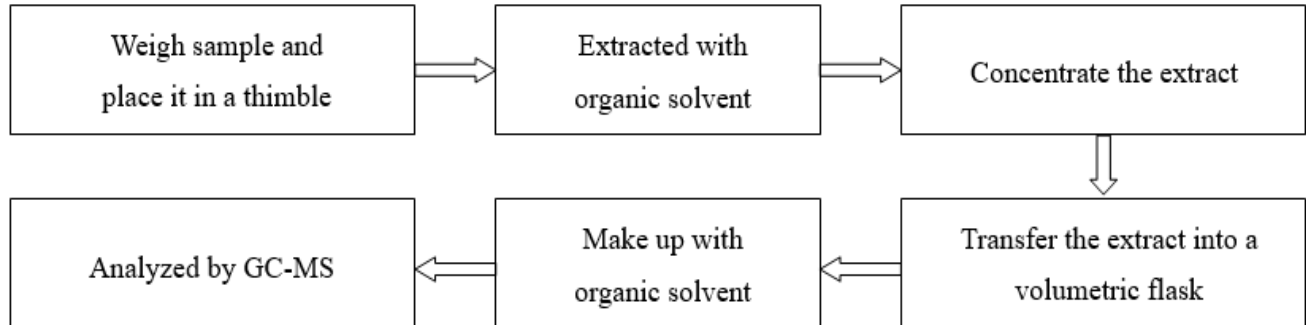


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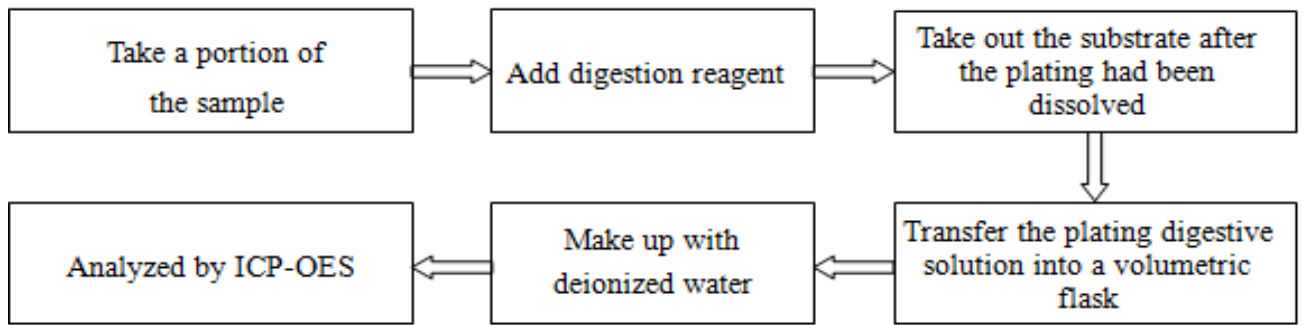
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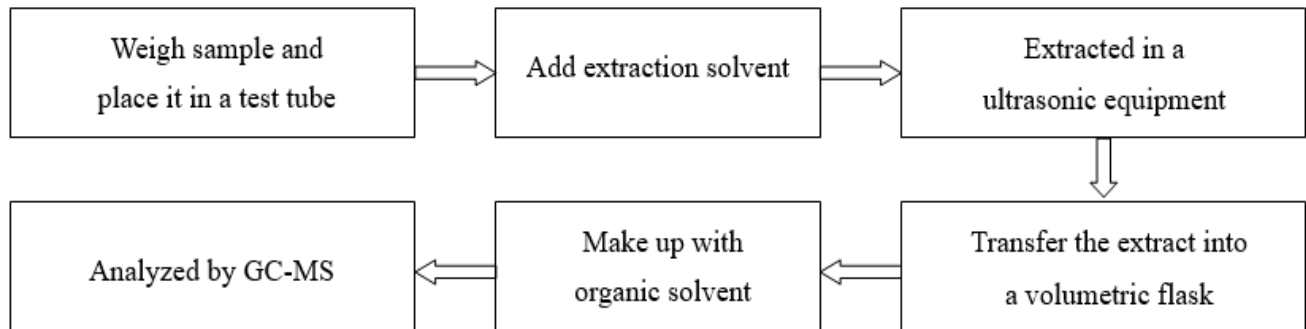
## 5. Phthalates



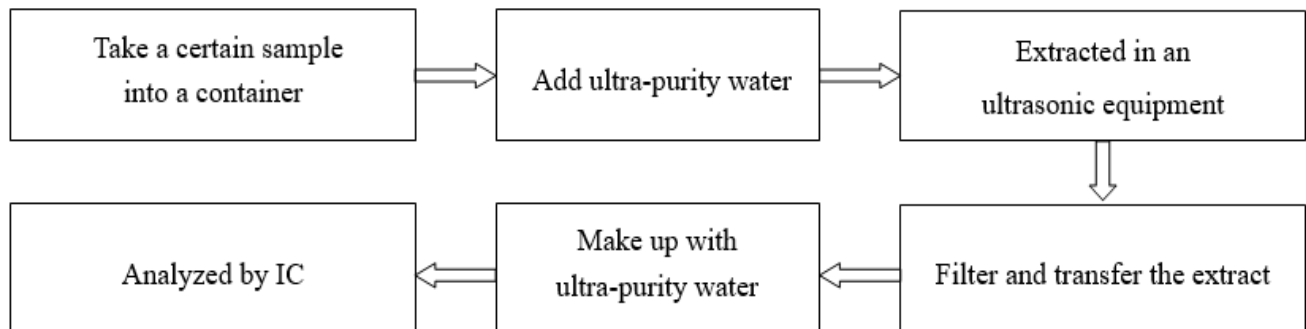
## 6. Beryllium(Be), Antimony(Sb)



## 7. Hexabromocyclododecane (HBCDD)



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



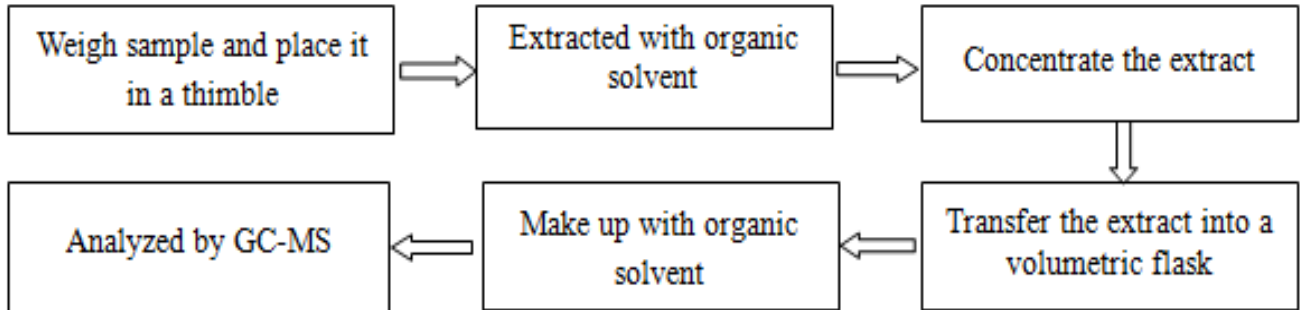


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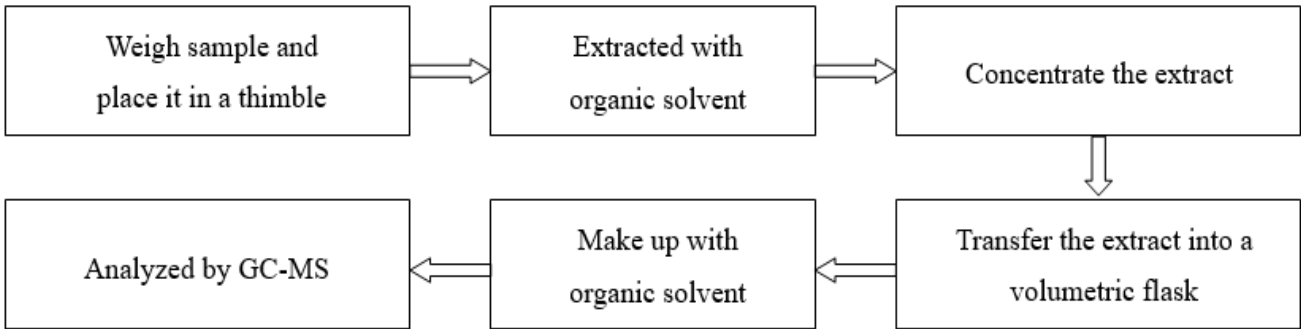
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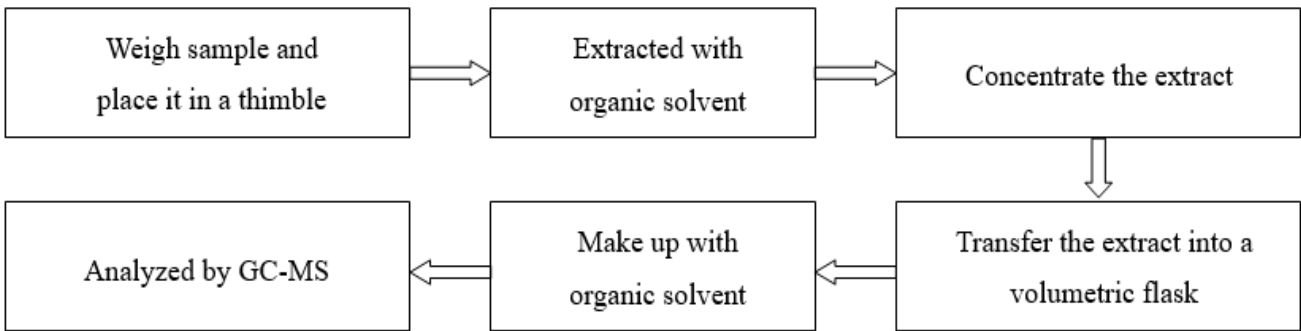
## 9. Polychlorinated Naphthalenes (PCNs)



## 10. Polychlorinated terphenyls (PCTs)



## 11. Polychlorinated Biphenyls(PCBs)

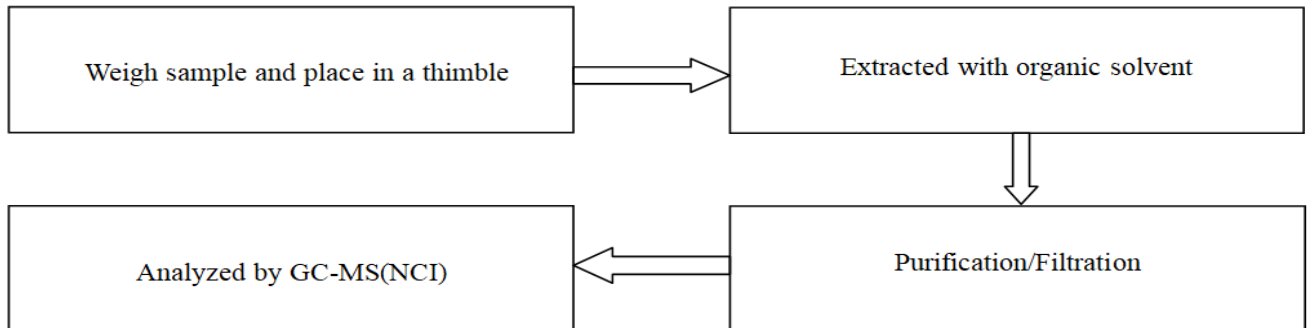


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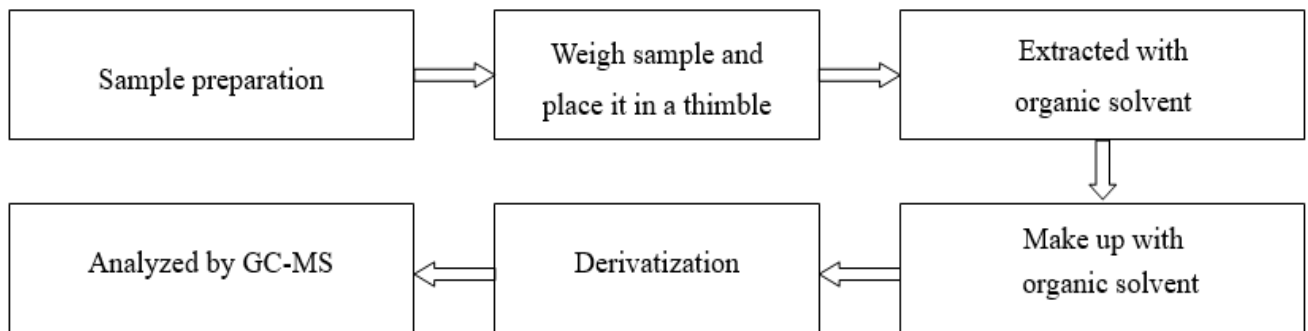
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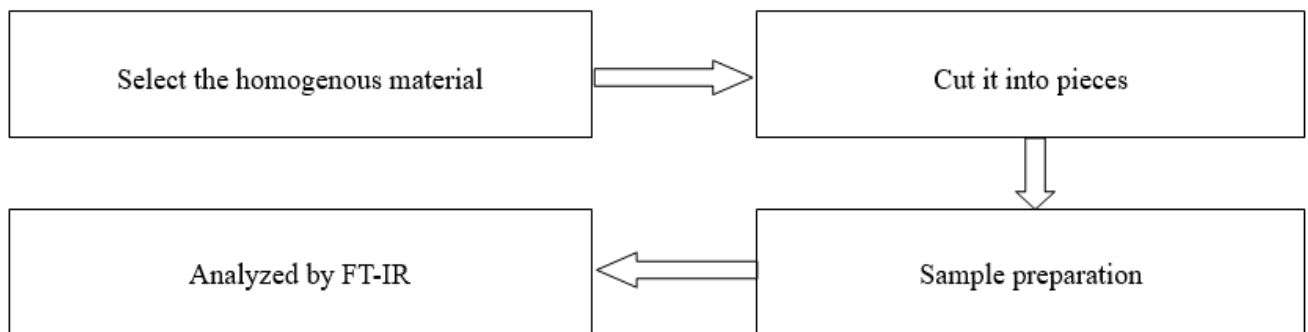
## 12. Short Chain Chlorinated Paraffins (SCCPs)



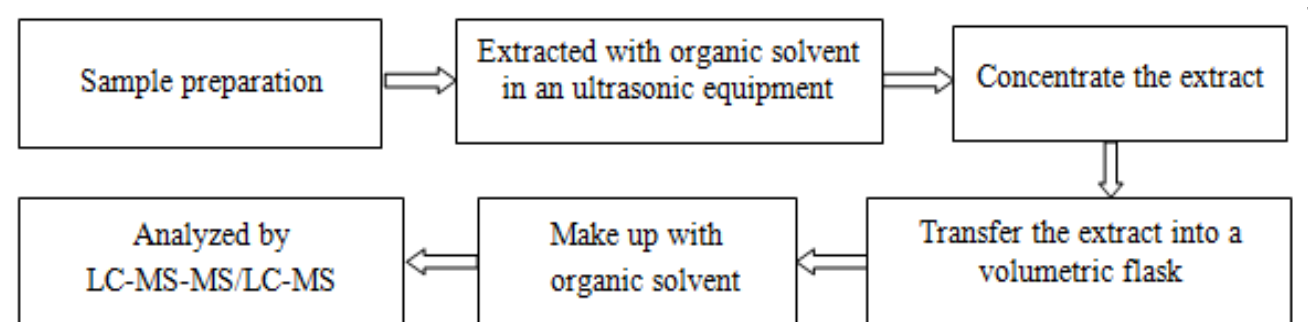
## 13. Organotin compounds



## 14. Polyvinyl Chloride (PVC)



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



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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 \*\*\*