CTI CENTRE TESTING INTERNATIONAL

Test Report

Report No. A2230180778101001

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	Au plating
Sample Received Date	Apr. 13, 2023
Testing Period	Apr. 20, 2023 to Apr. 27, 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), Beryllium(Be) in the submitted sample(s).

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

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

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Conclusion

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

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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.

Approved by: George Fong

Laboratory Manager

Date Apr. 27, 2023

No. R392331309

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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
Beryllium(Be)	Refer to US EPA 3050B:1996 & US EPA 6010D:2018	ICP-OES

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Test Result(s)

Tested Item(s)	Result	MDL	Limit
	001		
Lead (Pb)*1	N.D.	2 mg/kg	1000 mg/kg
Cadmium (Cd) *1	N.D.	2 mg/kg	100 mg/kg
Mercury (Hg) *1	N.D.	2 mg/kg	1000 mg/kg
Hexavalent Chromium (Cr(VI)) *1	N.D. ▼	0.10 μg/cm² (LOQ)	1000 mg/kg
Tested Item(s)	**Result**	**MDL**	**Limit**
	001		
Polybrominated Biphenyls (PBBs) *1			
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**
	001		
Polybrominated Diphenyl Ethers (PBDEs) *1			
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
	001		
Phthalates (DBP, BBP, DEHP, DIBP) *1			
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
Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg	1000 mg/kg
Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg	1000 mg/kg

Tested Item(s)	Result	MDL
	001	
Fluorine (F) *1	N.D.	50 mg/kg
Chlorine (Cl) *1	N.D.	50 mg/kg
Bromine (Br) *1	N.D.	50 mg/kg
Iodine (I) *1	N.D.	50 mg/kg

Tested Item(s)	Result	MDL
	001	
Phthalates		
Bis(2-methoxyethyl) phthalate (DMEP) *1 CAS#:117-82-8	N.D.	50 mg/kg
Di-n-hexyl phthalate (DNHP/DHEXP) *1 CAS#:84-75-3*1	N.D.	50 mg/kg
Di-iso-decyl phthalate (DIDP) *1 CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
Di-isononyl phthalate (DINP) *1 CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
Di-n-octyl phthalate (DNOP) *1 CAS#:117-84-0	N.D.	50 mg/kg
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) *1 CAS#:71888-89-6	N.D.	50 mg/kg
1,2-Benzenedicarboxylic acid, di-(C7-11)-branched and linear alkyl esters (DHNUP) *1 CAS#:68515-42-4	N.D.	50 mg/kg

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Test Result(s)

Tested Item(s)	Result	MDL
	001	
Organotin compounds		
Dibutyltin (DBT) *1	N.D.	5 mg/kg
Dioctyltin (DOT) *1	N.D.	5 mg/kg
Tributyltin (TBT) *1	N.D.	5 mg/kg
Triphenyltin (TPHT) *1	N.D.	5 mg/kg
Tributyltin oxide (TBTO)* *1	N.D.	5 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Antimony (Sb) *1	N.D.	10 mg/kg
Beryllium (Be)	N.D.	10 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Polychlorinated Biphenyls(PCBs) *1		
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**
	001	
Short Chain Chlorinated Paraffins (SCCPs) *1	N.D.	50 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Polyvinyl Chloride (PVC) *1	Negative	/
Tested Item(s)	**Result**	**MDL**
	001	
Perfluorooctanoic Acid (PFOA) *1	N.D.	0.01 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Perfluorooctane Sulfonates (PFOS) *1	N.D.	0.01 mg/kg

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Test Result(s)

Tested Item(s)	**Result**	**MDL**
	001	
Polychlorinated Triphenyls (PCTs) *1	N.D.	5 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Hexabromocyclododecane (HBCDD) *1	N.D.	20 mg/kg
Tested Item(s)	**Result**	**MDL**
	001	
Polychlorinated Naphthalenes (PCNs) *1	N.D.	5 mg/kg

Sample/Part Description

No.	CTI Sample ID	Description
1	001	Golden plating

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

-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/cm²

-▼The sample is negative for Cr(VI) − The Cr(VI) concentration is below 0.10 μg/cm².
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.

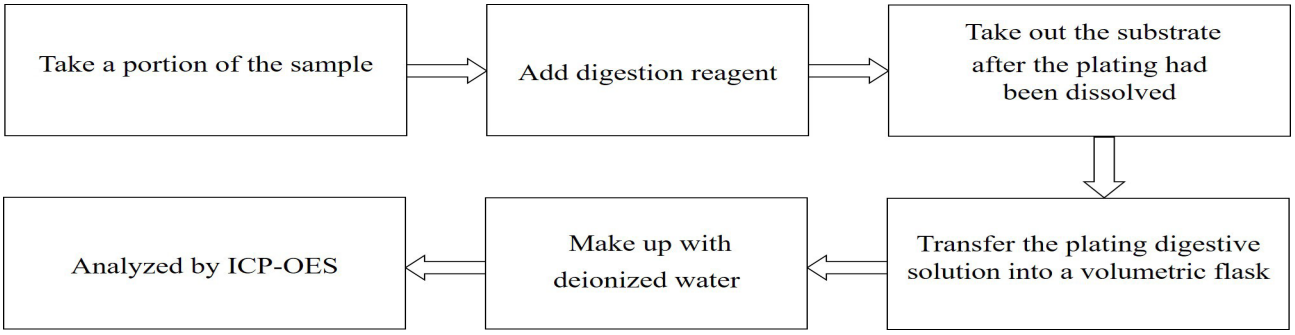
-*1=The test result(s) of sample is(are) presented in reference to the result(s) that reported in No. A2230163012101001.

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

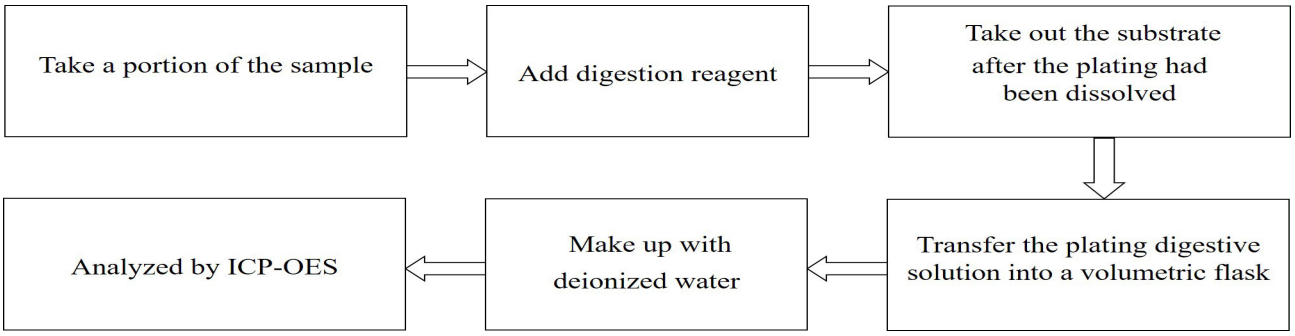
Test Report

Test Process

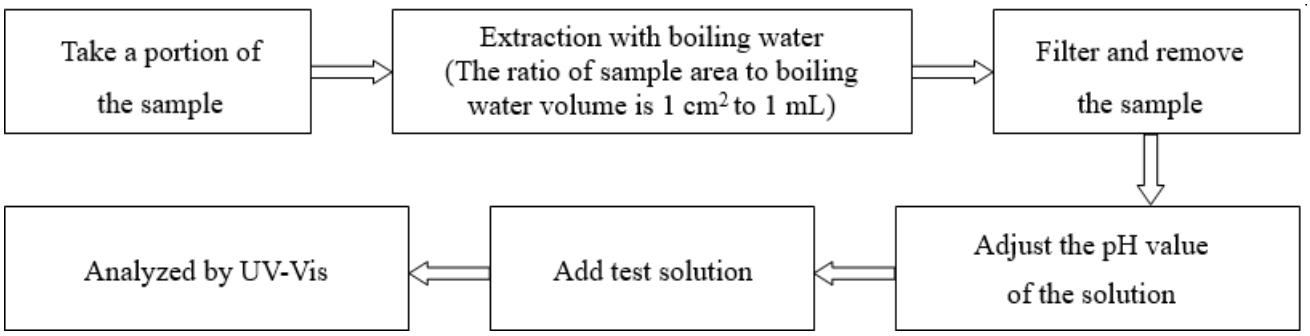
1. Lead (Pb), Cadmium (Cd)



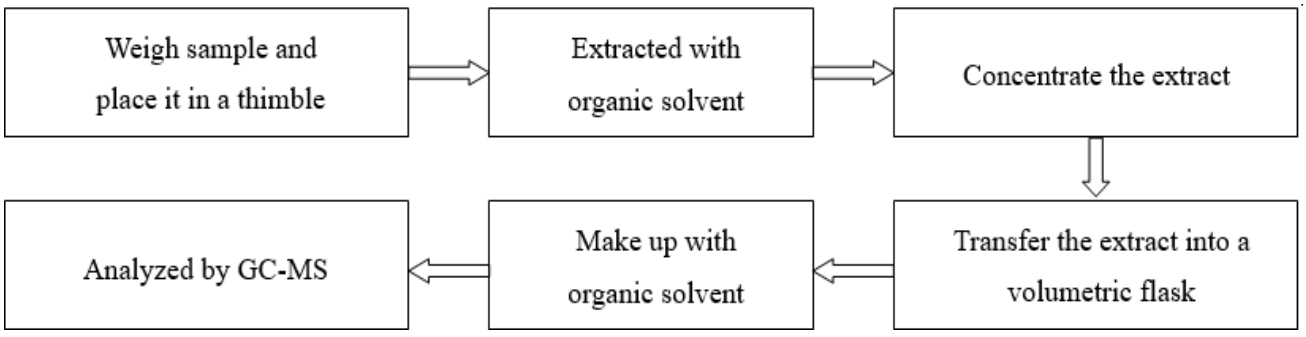
2. Mercury (Hg)



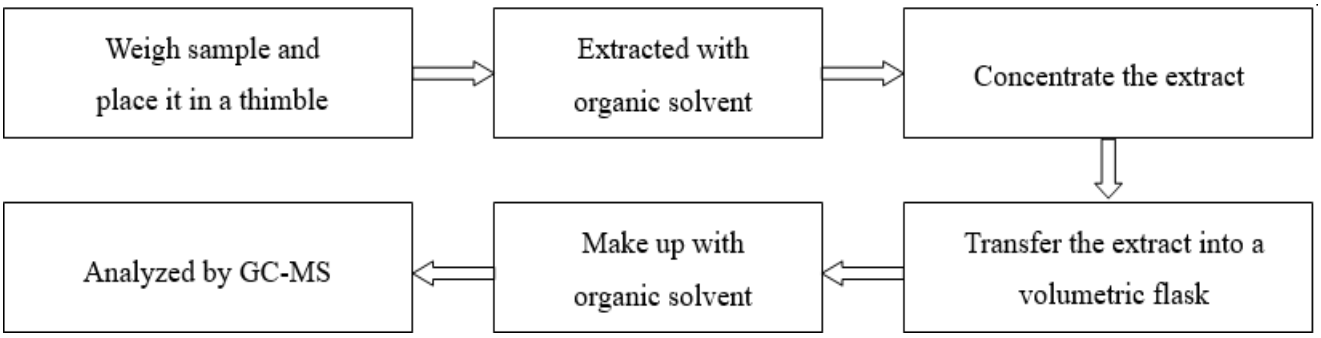
3. Hexavalent Chromium (Cr(VI))



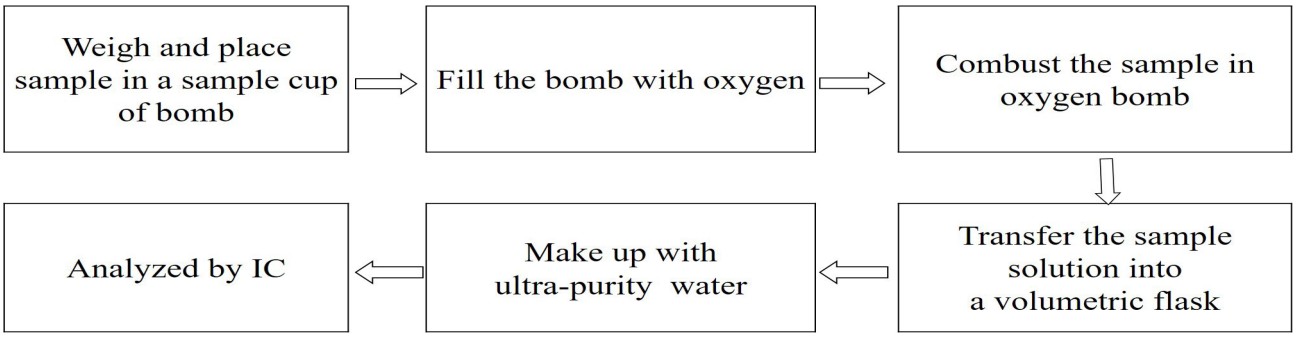
4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)



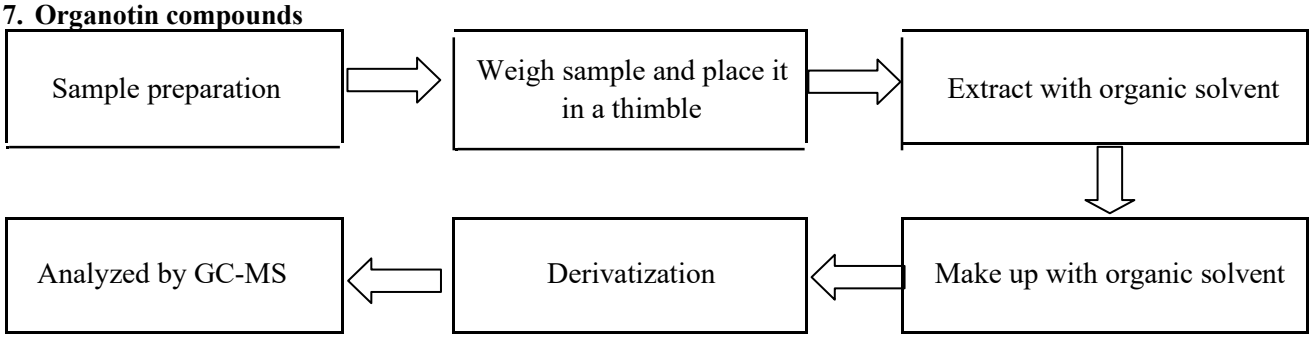
5. Phthalates (DBP, BBP, DEHP, DIBP), Phthalates



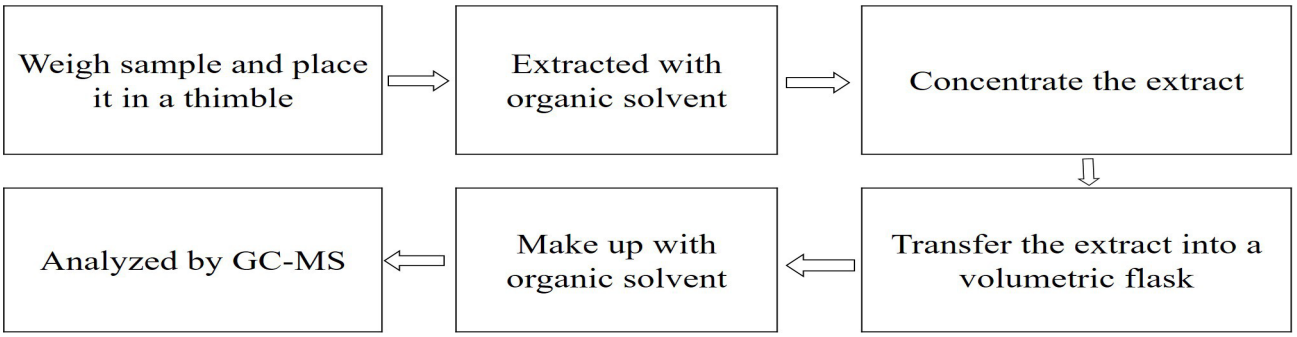
6. Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)



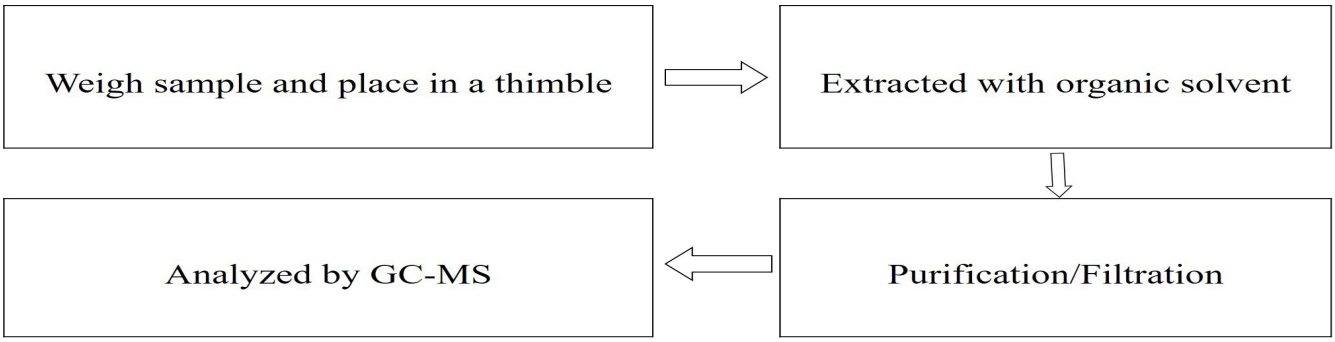
7. Organotin compounds



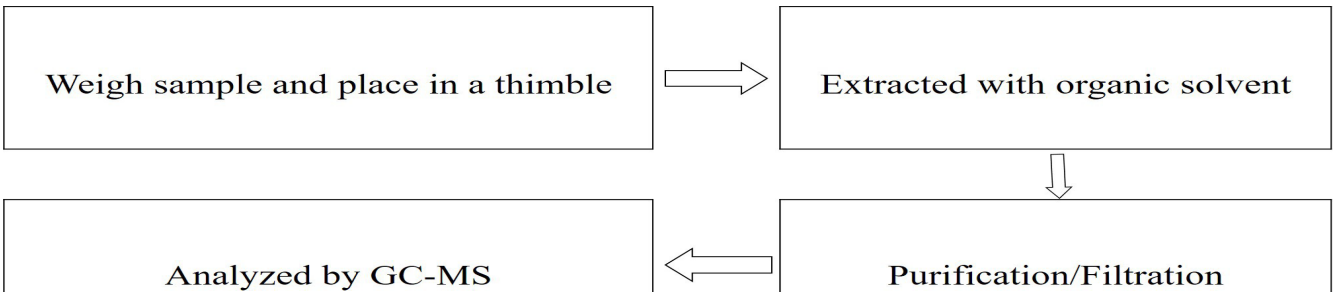
8. Hexabromocyclododecane (HBCDD)



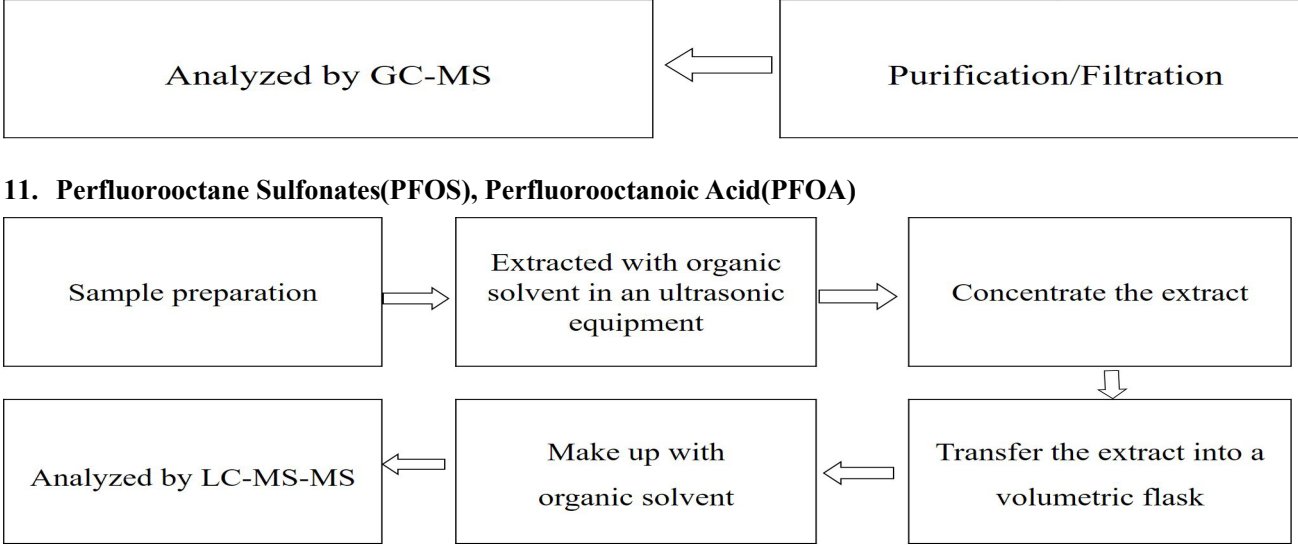
9. Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs)



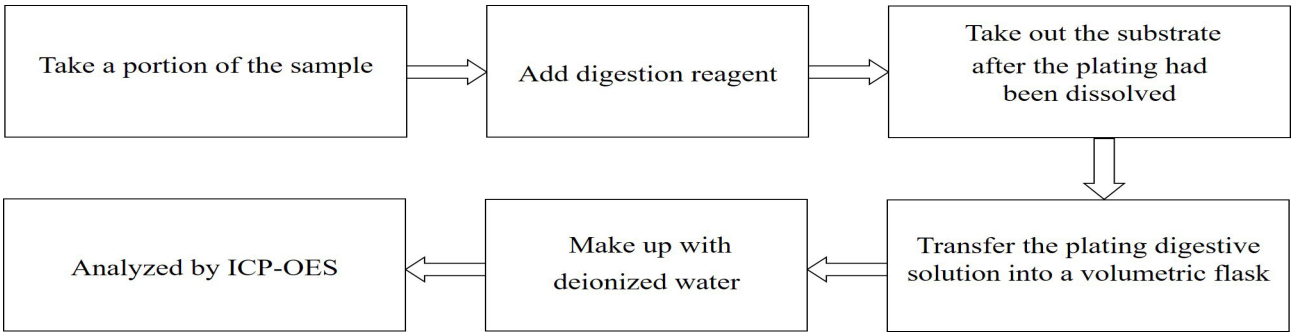
10. Short Chain Chlorinated Paraffins (SCCPs)



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



12. Antimony(Sb), Beryllium (Be)



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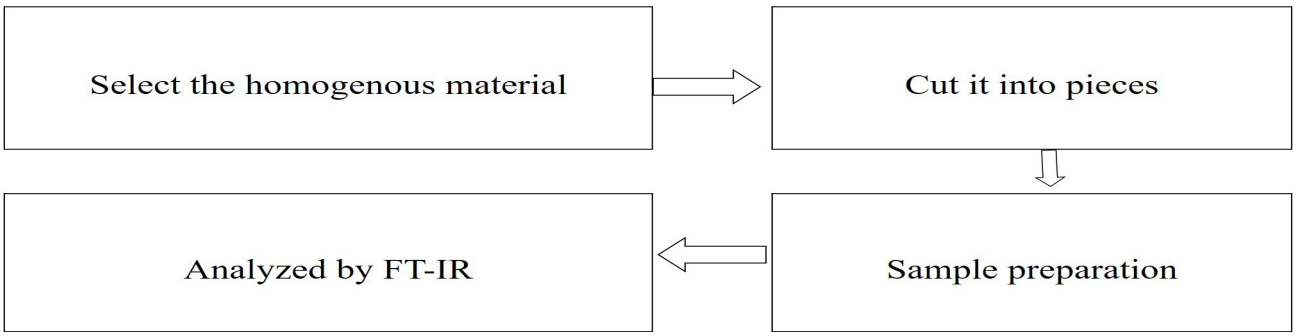
13. Polyvinyl Chloride (PVC)



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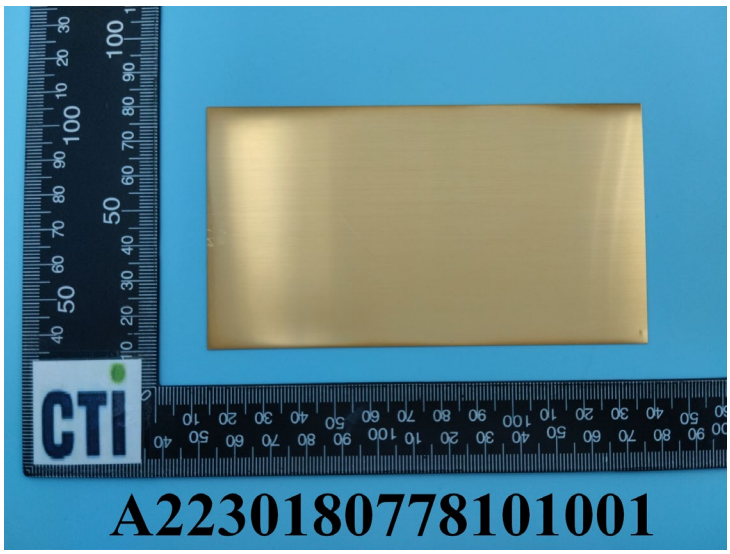
Photo(s) of the sample(s)



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 ***