

# Test Report



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**Report No.** A2250211148101003

**Company Name** MITSUI HIGH-TEC INC.  
**shown on Report**

**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. 7, 2025  
**Testing Period** Apr. 7, 2025 to Apr. 16, 2025

**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), Organotin compounds, Perfluorooctanoic acid (PFOA) and its salts, Perfluorooctanesulfonic acid (PFOS) and its salts & related substances, Phthalates, Antimony(Sb), Arsenic(As), Beryllium(Be), Hexabromocyclododecane (HBCDD), Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated Terphenyls (PCTs), Polyvinyl Chloride (PVC), Short Chain Chlorinated Paraffins (SCCPs), Red phosphorus 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*

George Fong  
Laboratory Manager

Date

Apr. 16, 2025

No. R175251373

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)	EN 14582:2016	IC
Chlorine (Cl)	EN 14582:2016	IC
Bromine (Br)	EN 14582:2016	IC
Iodine (I)	EN 14582:2016	IC
Organotin compounds	Refer to US EPA 3550C:2007 & ISO 17353:2004	GC-MS
Perfluorooctanoic acid (PFOA) and its salts	Refer to DIN CEN/TS 15968:2010	LC-MS-MS
Perfluorooctanesulfonic acid (PFOS) and its salts & related substances	Refer to DIN CEN/TS 15968:2010	LC-MS-MS
Phthalates	IEC 62321-8:2017	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	FTIR
Hexabromocyclododecane (HBCDD)	IEC 62321-9:2021	GC-MS
Beryllium(Be)	Refer to US EPA 3050B:1996 & US EPA 6010D:2018	ICP-OES
Arsenic(As)	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
Red phosphorus	GB/T 6040 2019, GB/T 9722 2023, GB/T 17359 2023, EPA 6010D:2018	ICP OES, PY GC MS, FTIR, EM

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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	
Organotin compounds		
Dibutyltin (DBT)	N.D.	5 mg/kg
Diocetyl tin (DOT)	N.D.	5 mg/kg
Tributyltin (TBT)	N.D.	5 mg/kg
Triphenyltin (TPhT)	N.D.	5 mg/kg
Tributyltin oxide (TBTO) * <sup>1</sup>	N.D.	5 mg/kg
Tested Item(s)	Result	MDL
	003	
Red phosphorus <sup>#1</sup>	N.D.	500 mg/kg

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**Test Result(s)**

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
Tested Item(s)	Result	MDL
	003	
Antimony (Sb)	N.D.	2 mg/kg
Beryllium (Be)	N.D.	2 mg/kg
Arsenic (As)	N.D.	2 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

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**Test Result(s)**

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	
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

Tested Item(s)	CAS No.	Result	MDL
		003	
Perfluorooctanoic acid (PFOA) and its salts			
Perfluorooctanoic acid (PFOA)	335-67-1	N.D.	0.01 mg/kg
Ammonium pentadecafluorooctanoate (APFO)*	3825-26-1	N.D.	0.01 mg/kg
Sodium perfluorooctanoate (PFOA-Na)*	335-95-5	N.D.	0.01 mg/kg
Potassium perfluorooctanoate (PFOA-K)*	2395-00-8	N.D.	0.01 mg/kg
Silver perfluorooctanoate (PFOA-Ag)*	335-93-3	N.D.	0.01 mg/kg
Perfluorooctanoyl fluoride (PFOA-F)*	335-66-0	N.D.	0.01 mg/kg

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## Test Result(s)

Tested Item(s)	CAS No.	Result	MDL
		003	
Perfluorooctanesulfonic acid (PFOS) and its salts & related substances			
Perfluorooctane Sulfonates (PFOS)	1763-23-1	N.D.	0.01 mg/kg
Perfluorooctanesulfonic acid, potassium salt (PFOS-K)*	2795-39-3	N.D.	0.01 mg/kg
Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)*	29457-72-5	N.D.	0.01 mg/kg
Sodium perfluorooctane sulfonate (PFOS-Na)*	4021-47-0	N.D.	0.01 mg/kg
1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluoro-, magnesium salt (2:1) (PFOS-Mg)*	91036-71-4	N.D.	0.01 mg/kg
Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH <sub>4</sub> )*	29081-56-9	N.D.	0.01 mg/kg
Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) <sub>2</sub> )*	70225-14-8	N.D.	0.01 mg/kg
Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C <sub>2</sub> H <sub>5</sub> ) <sub>4</sub> )*	56773-42-3	N.D.	0.01 mg/kg
Didecyl dimethyl ammonium perfluorooctane sulfonate (PFOS-DDA)*	251099-16-8	N.D.	0.01 mg/kg
Perfluoro-1-octanesulfonyl fluoride (PFOSF)*	307-35-7	N.D.	0.01 mg/kg
Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluorooctanesulfonate*	71463-74-6	N.D.	0.01 mg/kg
N-Ethylperfluoro-1-octanesulfonamide (N-Et-FOSA)	4151-50-2	N.D.	0.05 mg/kg
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-Methylperfluoro-1-octanesulfonamide (N-Me-FOSA)	31506-32-8	N.D.	0.05 mg/kg
2-(N-Ethylperfluoro-1-octanesulfonamido)-ethanol (N-Et-FOSE)	1691-99-2	N.D.	0.05 mg/kg
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- 2-(N-Methylperfluoro-1-octanesulfonamido)-ethanol (N-Me-FOSE)	24448-09-7	N.D.	0.05 mg/kg
Perfluorooctanesulfonamide (PFOSA)	754-91-6	N.D.	0.01 mg/kg

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**Sample/Part Description**

No.	CTI Sample ID	Description
1	003	Gray plating

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

-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. Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

-Negative = Not contained Polyvinyl Chloride(PVC)

-\*=Result(s) shown of the substance(s) is/ are converted from the result(s) of certain compound(s).

-\*1=Concentration value of Tributyltin oxide by the conversion from the test results of Tributyl Tins.

**Note:**            **“ #1 ” indicates the testing item(s) was (were) fulfilled by Centre Testing International (Suzhou) Co.,Ltd.**



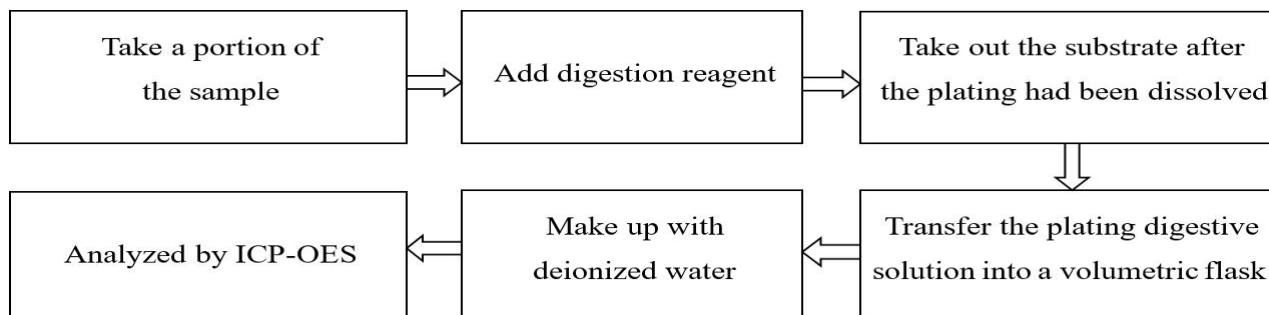
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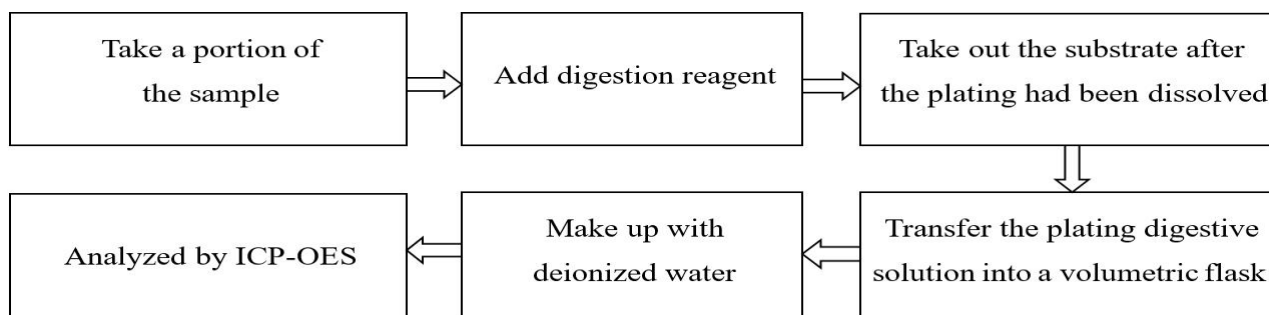
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## Test Process

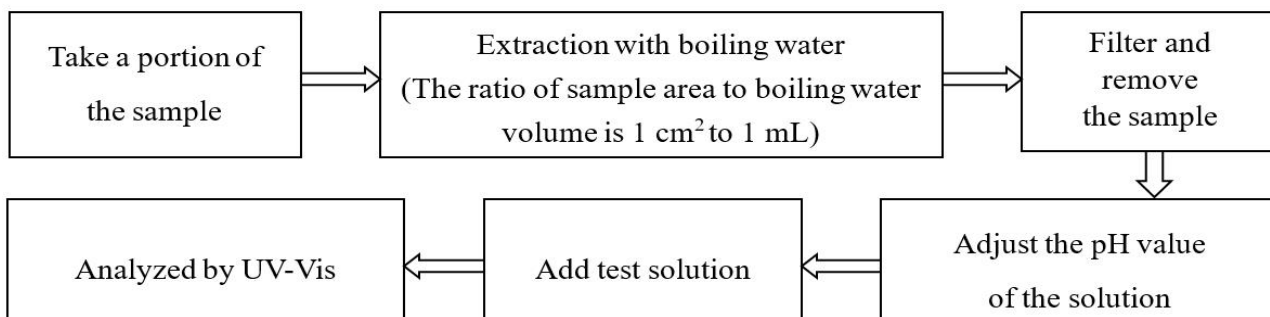
### 1. Lead (Pb), Cadmium (Cd)



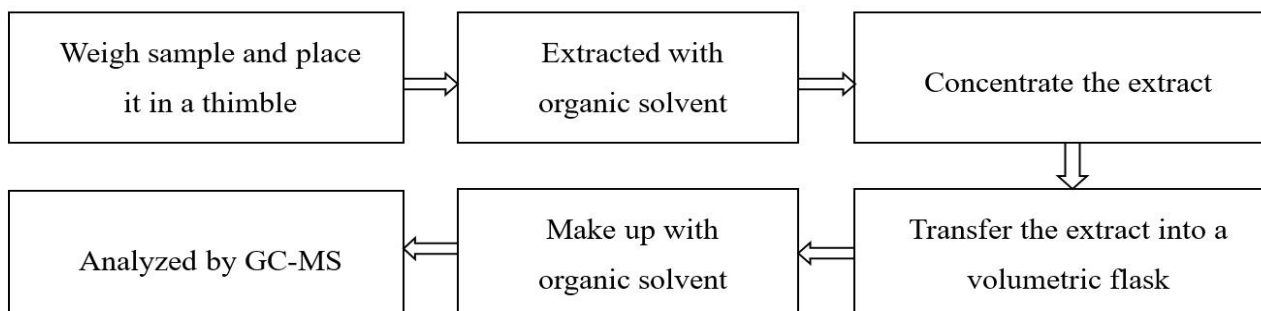
### 2. Mercury (Hg)



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



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

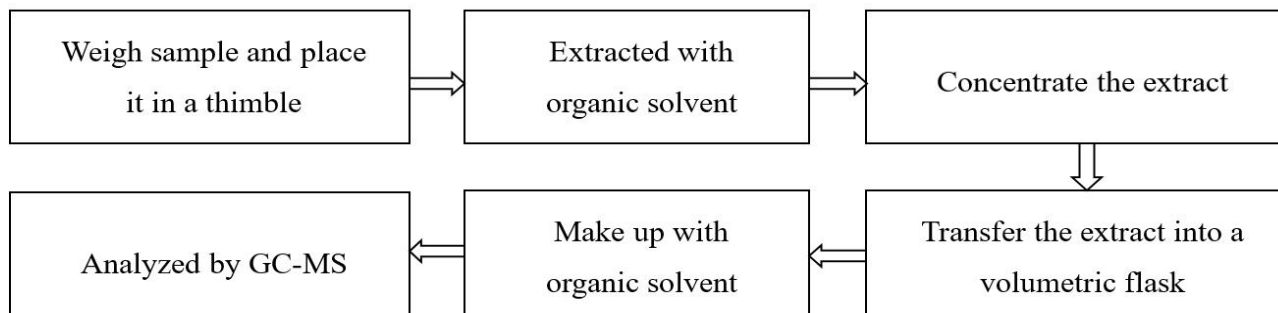


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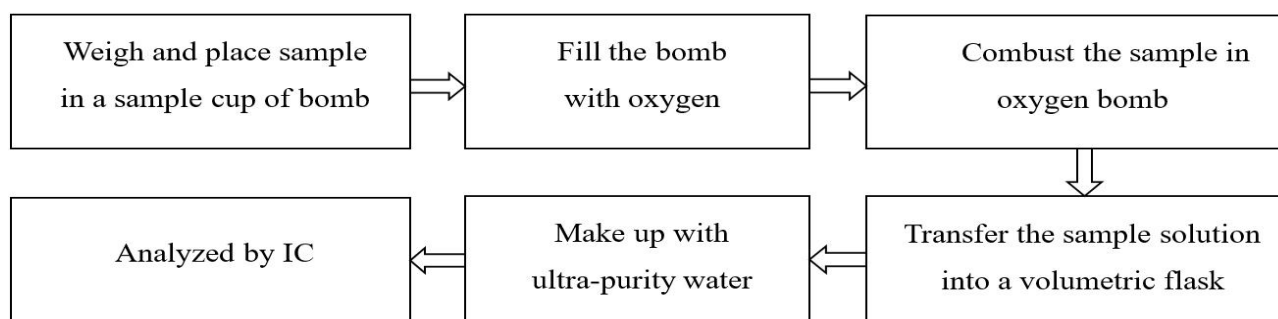
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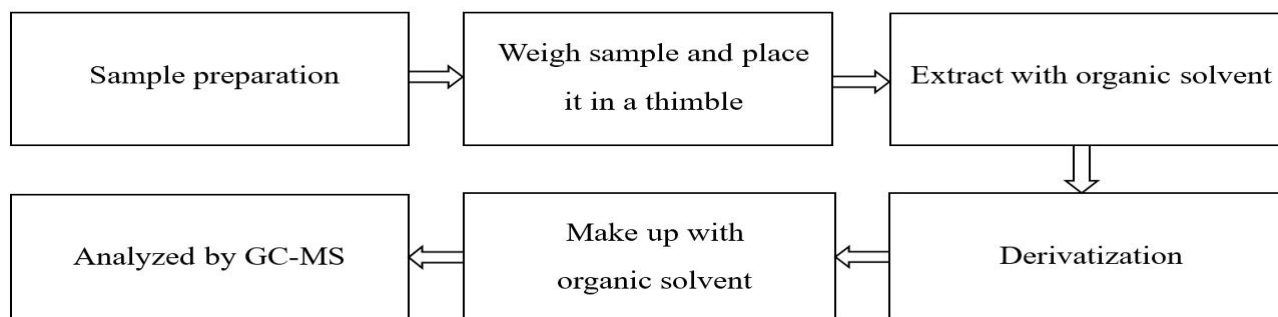
## 5. Phthalates (DBP, BBP, DEHP, DIBP), Phthalates



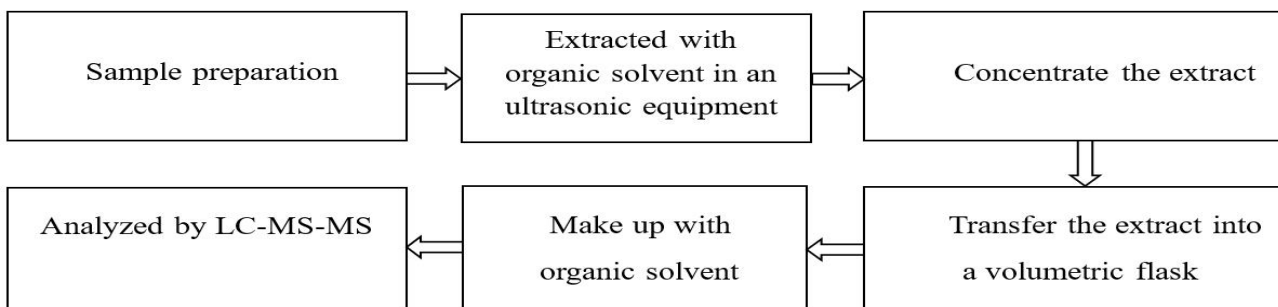
## 6. Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)



## 7. Organotin compounds



## 8. Perfluorooctanoic acid (PFOA) and its salts, Perfluorooctanesulfonic acid (PFOS) and its salts & related substances

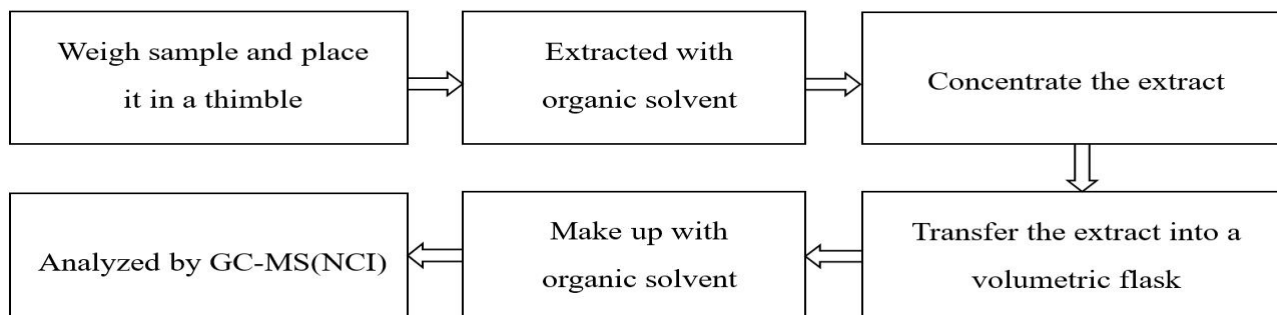


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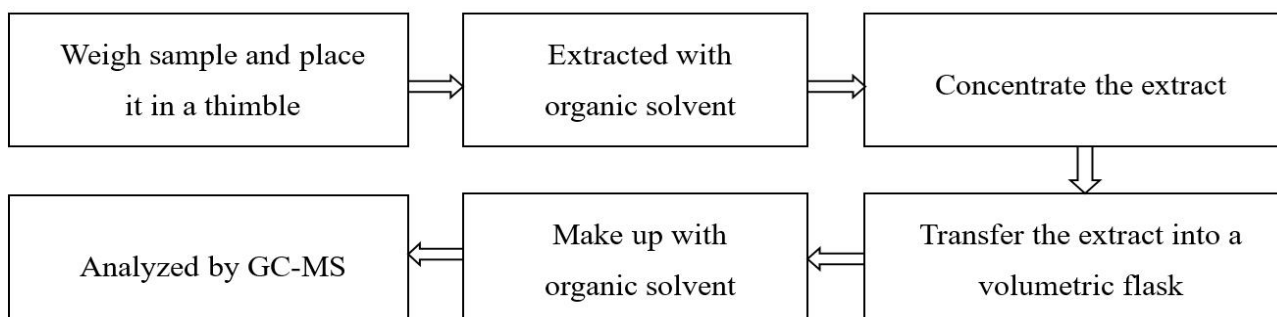
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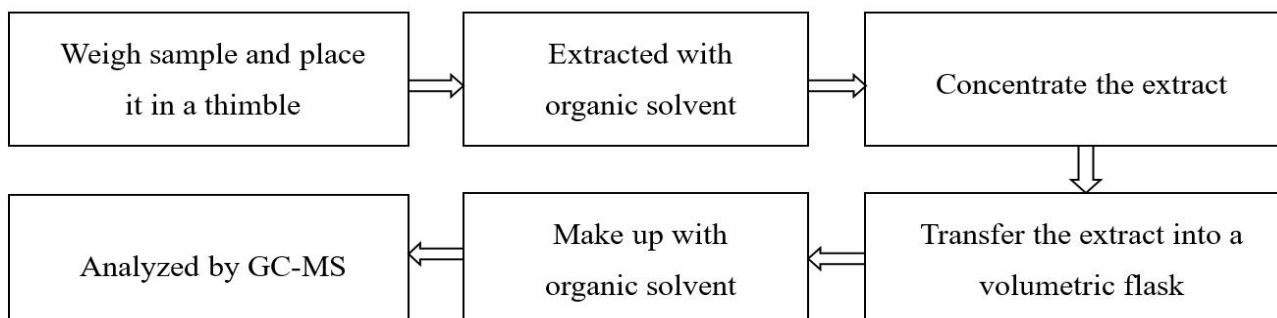
## 9. Short Chain Chlorinated Paraffins (SCCPs)



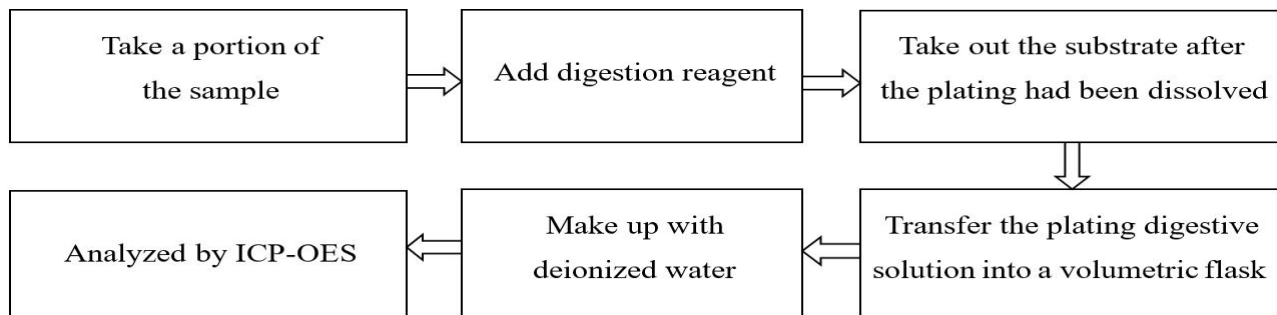
## 10. Hexabromocyclododecane (HBCDD)



## 11. Polychlorinated Naphthalenes (PCNs), Polychlorinated Terphenyls (PCTs), Polychlorinated Biphenyls(PCBs)



## 12. Antimony(Sb), Beryllium(Be), Arsenic(As)

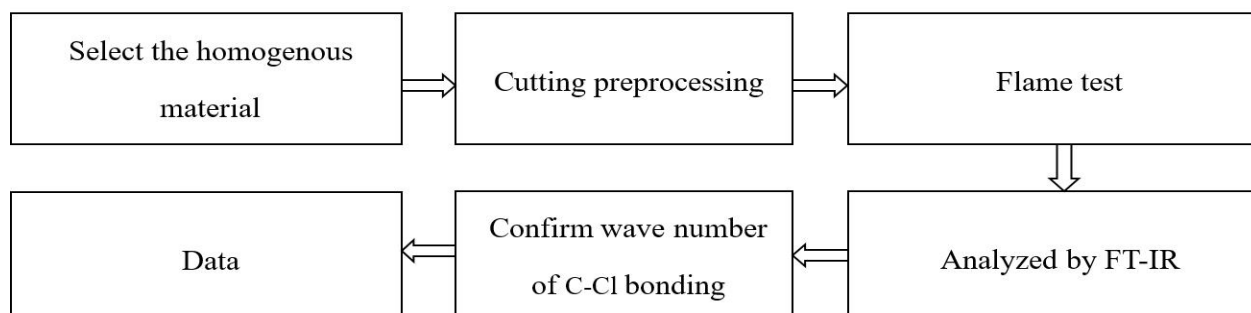


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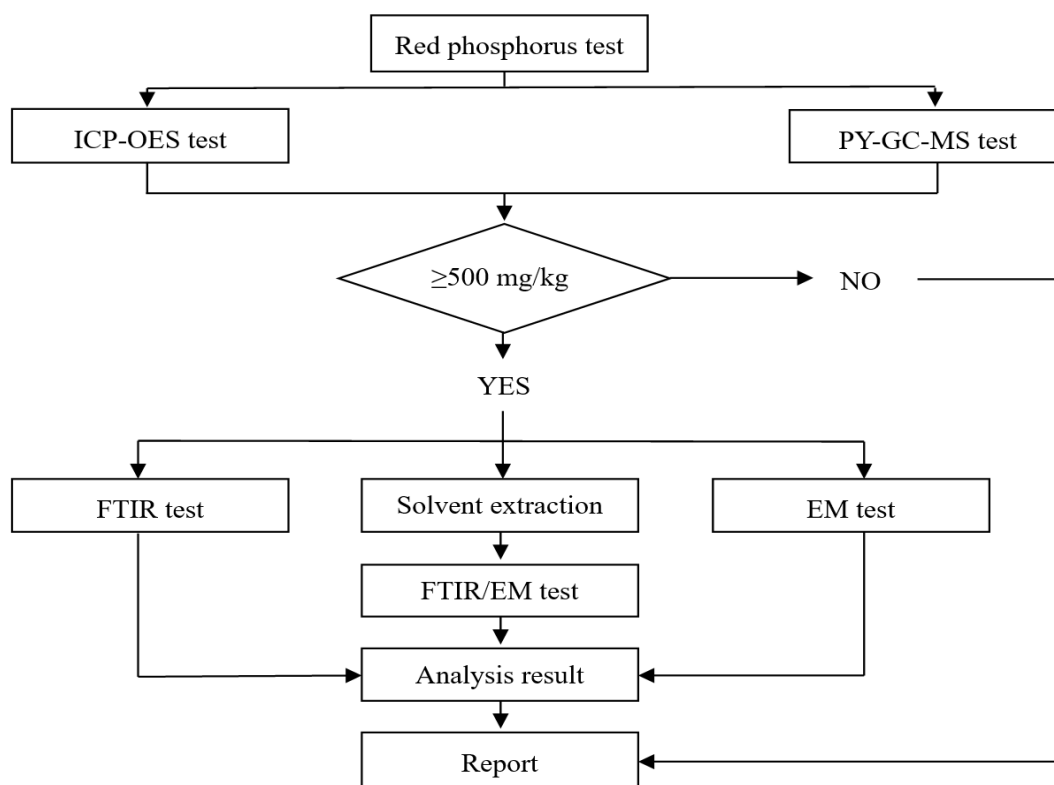
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## 13. Polyvinyl Chloride (PVC)



## 14. Red phosphorus



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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 \*\*\*