

Test Report

Report No. A2180167806101001

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Applicant UNIMICRON (SUZHOU) TECHNOLOGY CORP.

Address NO. 160 FENGLI ST. SUZHOU INDUSTRIAL PARK, JIANGSU

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

Sample Name	Cu Plating layer
Part No.	Cu Plating layer
Material	Cu Plating layer
Supplier	UMTC
Sample Received Date	Sep. 10, 2018
Testing Period	Sep. 10, 2018 to Sep. 14, 2018

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), Arsenic(As), Beryllium(Be), Antimony(Sb), Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA), Hexabromocyclododecane (HBCDD) in the submitted sample(s).

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

Tested by

Wangdong

Reviewed by

Taoying

Approved by

Su Hongwei

Date

Sep. 14, 2018

Su Hongwei

Senior Laboratory Manager

No. R198695732

Centre Testing International Pimiao (Shanghai) Co., Ltd.

No. 1996, Xinqiniao Road, Pudong New District, Shanghai, China



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Test Method

Tested 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
Arsenic(As)	Refer to US EPA 3050B:1996 & US EPA 6010D:2014	ICP-OES
Beryllium(Be)	Refer to US EPA 3050B:1996 & US EPA 6010D:2014	ICP-OES
Antimony(Sb)	Refer to US EPA 3050B:1996 & US EPA 6010D:2014	ICP-OES
Perfluorooctane Sulfonates (PFOS)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Perfluorooctanoic Acid (PFOA)	Refer to US EPA 3550C:2007 & US EPA 8321B:2007	LC-MS-MS
Hexabromocyclododecane (HBCDD)	Refer to US EPA 3550C:2007 & US EPA 8270D:2014	GC-MS

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Test Result(s)

Tested Item(s)	Result	MDL
	002	
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/cm ² (LOQ)

Tested Item(s)	Result	MDL
	002	
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
	002	
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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Tested Item(s)	Result	MDL
	002	
Phthalates (DBP, BBP, DEHP, DIBP)		
Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
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
Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg

Tested Item(s)	Result	MDL
	002	
Fluorine (F)	N.D. * ¹	50 mg/kg
Chlorine (Cl)	N.D. * ¹	50 mg/kg
Bromine (Br)	N.D. * ¹	50 mg/kg
Iodine (I)	N.D. * ¹	50 mg/kg

Tested Item(s)	Result	MDL
	002	
Arsenic (As)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
	002	
Beryllium (Be)	N.D.	10 mg/kg

Tested Item(s)	Result	MDL
	001	
Antimony (Sb)	N.D.	2 mg/kg

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Tested Item(s)	Result	MDL
	002	
Perfluorooctane Sulfonates (PFOS)	N.D.	0.5 µg/m ²

Tested Item(s)	Result	MDL
	002	
Perfluorooctanoic Acid (PFOA)	N.D.	0.5 µg/m ²

Tested Item(s)	Result	MDL
	002	
Hexabromocyclododecane (HBCDD)	N.D.	5 mg/kg

Tested Sample/Part Description

- 001 Metal with cupreous plating
- 002 Cupreous plating

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

-*= The specified area sample is extracted by an ultrasonic bath in ultra-pure water, and then the extracted liquid is analyzed by IC.

-*¹=The value is converted from the test result with the density and thickness provided by client (Density = 8.953g/cm³, thickness = 75.05µm).

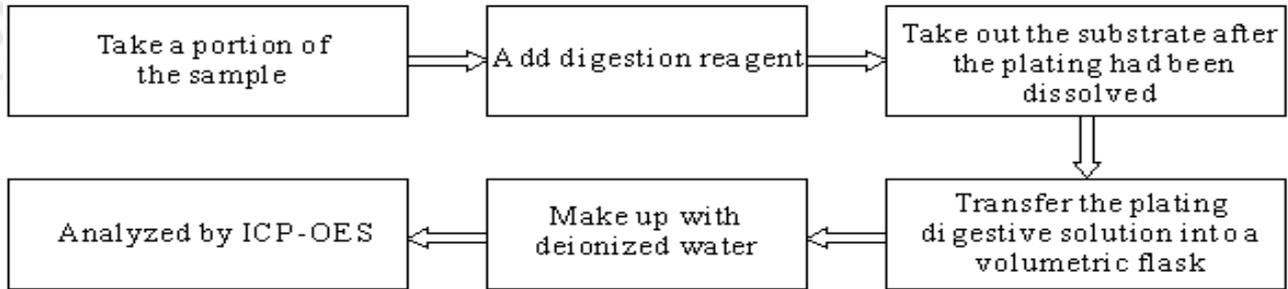
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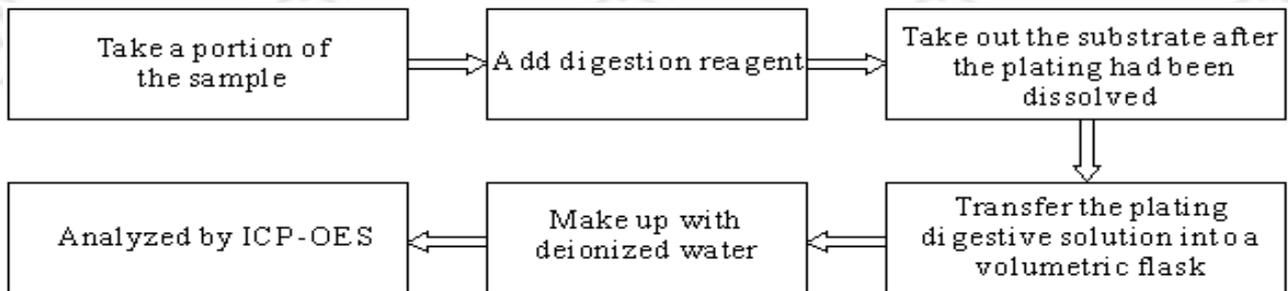
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Test Process

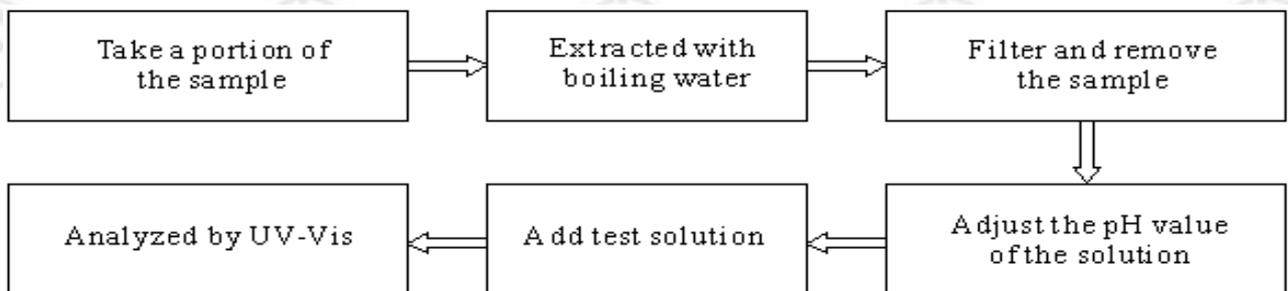
1. Cadmium(Cd),Lead(Pb)



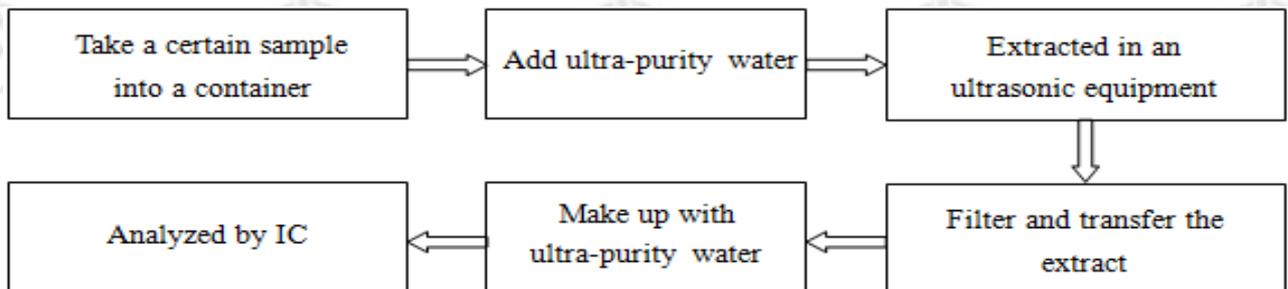
2. Mercury(Hg)



3. Hexavalent Chromium(Cr(VI))



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

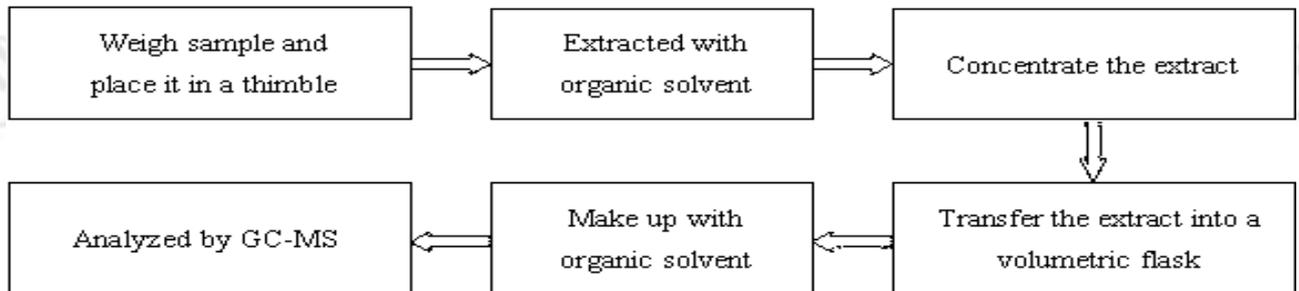


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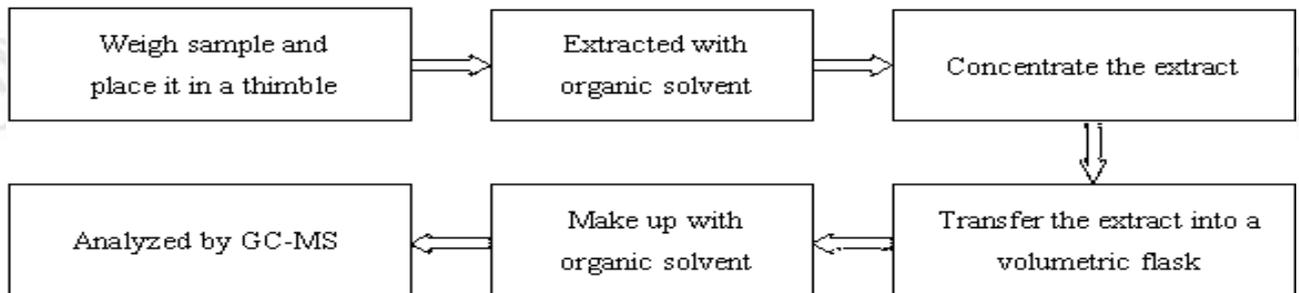
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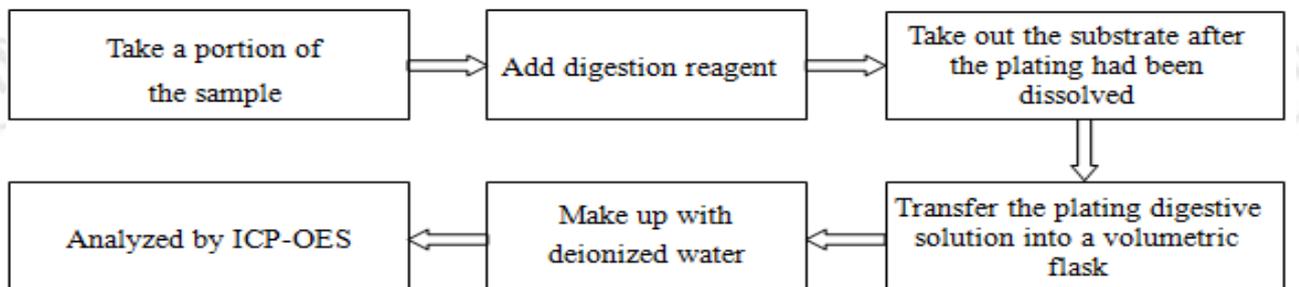
5. Polybrominated Biphenyls(PBBs), Polybrominated Diphenyl Ethers (PBDEs)



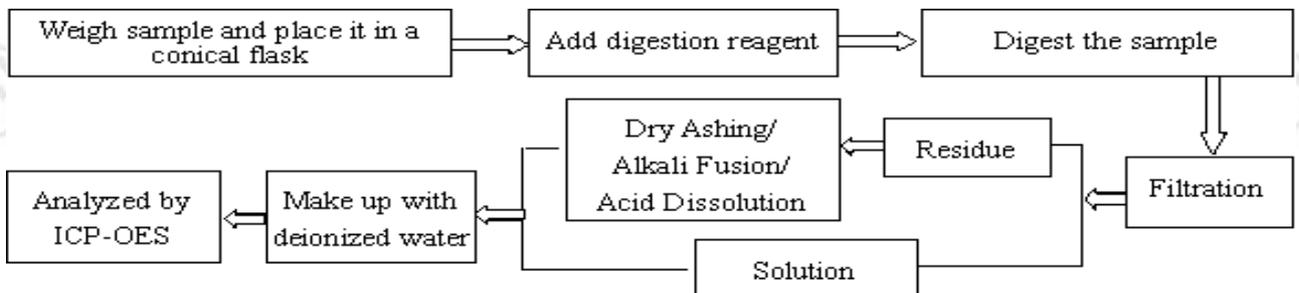
6. Phthalates (DBP, BBP, DEHP, DIBP)



7. Arsenic(As), Beryllium(Be)



8. Antimony(Sb)

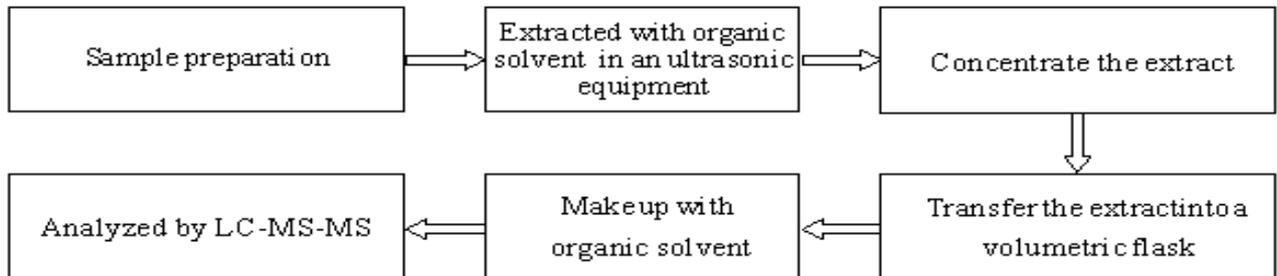


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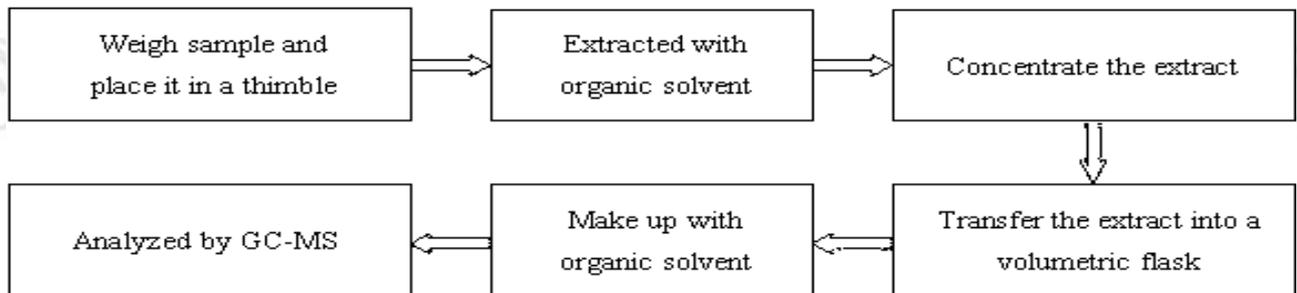
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9. Perfluorooctane Sulfonates (PFOS), Perfluorooctanoic Acid (PFOA)



10. Hexabromocyclododecane (HBCDD)



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Photo(s) of the sample(s)



*** End of Report ***

Statement:

1. This report is considered invalidated without approval signature, special seal and the seal on the perforation;
2. The sample(s) and sample information was/were provided by the client 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.