

TEST REPORT

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202106034117-3
DATE: Jun, 03, 2021
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APPLICANT: TONGFU MICROELECTRONICS CO.,LTD.
ADDRESS: NO.288, Chongchuan Road, Chongchuan Economic Development Area, Nantong, Jiangsu, P.R.China

SAMPLE DESCRIPTION: The following samples were submitted and identified by the applicant as:
Sample Name: LQFP100NT
1. Silvery Metal
2. Black Body

TEST REQUESTED: 1. **Silvery Metal:** To determine the contents of lead (Pb), mercury (Hg), hexavalent chromium (Cr⁶⁺), cadmium (Cd), PFOA, PFOS, Beryllium oxide, Beryllium copper, Sb.
2. **black body:** To determine the contents of Pb, Cd, Hg, Cr⁶⁺, PBs, PBDEs, Sb, F, Cl, Br, I, PCBs, PCNs, PCTs, SCCP, TBT, TPT, DBT, DOT, Asbestos, Specific azo compounds, Formaldehyde, PVC and PVC compound, Beryllium oxide, Beryllium copper, DEHP, DBP, BBP, DINP, DIDP, DNOP, DNHP, DIHP, DHNUP, DMEP, HFC, PFC, UV320 (Specific benzotriazole), PFOS, PFOA, Cobalt dichloride, Ozonosphere destroy substance, DMF, Tris (2-chloroethyl) phosphate (TCEP), Hexabromocyclododecane (HBCDD), Diarsenic trioxide, Diarsenic pentaoxide, Boric acid, specific sodium borates, Diisobutyl phthalate (DIBP), 4-(1,1,3,3-tetramethylbutyl)phenol, Bis(2-methoxyethyl)ether-d14, DMAC, EGDME

TEST METHOD: Please refer to the next pages.
TESTING PERIOD: May, 24, 2021 - Jun, 03, 2021
RESULT: Please refer to next pages.

Authorized sign: _____

DAI XUEWEI



NOTE: ALL TEST RESULTS ARE ONLY VALID FOR THE SAMPLES BEING TESTED. THIS TEST REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF THE TESTING LABORATORY.

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TEST RESULTS:

Testing Item	Equipment	Test Method	Test Result	
			Sample 1	Sample 2
Pb	AAS	IEC62321-5:2013	N.D.(< 1 mg/kg)	N.D.(< 1 mg/kg)
Cd	AAS	IEC62321-5:2013	N.D.(< 1 mg/kg)	N.D.(< 1 mg/kg)
Hg	ICP-OES	IEC62321-4:2013	N.D.(< 1 mg/kg)	N.D.(< 1 mg/kg)
Cr6+	UV-Vis	IEC62321 Edition 1.0: 2008	Negative #	N.D.(< 1 mg/kg)
PBBs	-	-		-
Bromobiphenyl	GC-MS	IEC62321-6:2015	No requested	N.D.(< 5 mg/kg)
Dibromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Tribromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Tetrabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Pentabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Hexabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Heptabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Octabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Nonabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Decabromobiphenyl	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
PBDEs	-	-		-
Bromodiphenyl ether	GC-MS	IEC62321-6:2015	No requested	N.D.(< 5 mg/kg)
Dibromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Tribromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Tetrabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Pentabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Hexabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Heptabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Octabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Nonabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)
Decabromodiphenyl ether	GC-MS	IEC62321-6:2015		N.D.(< 5 mg/kg)

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			Sample 1	Sample 2
PCBs	GC-MS	EPA 8082A	No requested	N.D.(<10 mg/kg)
PCNs	GC-MS	EPA 8082A		N.D.(<10 mg/kg)
PCTs	GC-MS	EPA 8082A		N.D.(<10 mg/kg)
SCCP	GC-MS	EPA 3540C		N.D.(<10 mg/kg)
TBT	GC	DIN 38407-13		N.D.(<10 mg/kg)
TPT	GC	DIN 38407-13		N.D.(<10 mg/kg)
DBT	GC	DIN 38407-13		N.D.(<10 mg/kg)
DOT	GC	DIN 38407-13		N.D.(<10 mg/kg)
Asbestos	-	-		-
Anthrophyllite	X-ray Diffraction	Niosh Method 9000,issue 2	No requested	N.D.(<1 %)
Crocidolite	X-ray Diffraction	Niosh Method 9000,issue 2		N.D.(<1 %)
Amosite	X-ray Diffraction	Niosh Method 9000,issue 2		N.D.(<1 %)
Tremolite	X-ray Diffraction	Niosh Method 9000,issue 2		N.D.(<1 %)
Chrysotile	X-ray Diffraction	Niosh Method 9000,issue 2		N.D.(<1 %)
Actinolite	X-ray Diffraction	Niosh Method 9000,issue 2		N.D.(<1 %)
azo compounds	-	-		-
4-AMINODIPHENYL	GC-MS	35 LMBG	No requested	N.D.(<5 mg/kg)
BENZIDINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
4-CHLORO-O-TOLUIDINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
2-NAPHTHYLAMINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
O-AMINOAZOTOLUENE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
P-CHLOROANILINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
2,4-DIAMINOANISOLE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
4,4'-DIAMINODIPHENYL METHANE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
3,3'-DICHLOOROBENZIDINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)
3,3'-DIMETHOXYBENZIDINE	GC-MS	35 LMBG		N.D.(<5 mg/kg)

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3,3'-DIMETHYLBENZIDINE	GC-MS	35 LMBG	No requested	N.D.(< 5 mg/kg)
3,3'-DIMETHYL-4,4'-DIAMINODIPHENYLMETHANE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
P-CRESIDINE(2-METHOXY-5-METHYLANILINE)	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
4,4'-METHYLENE-BIS-(2-CHLOROANILINE)	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
4,4'-OXYDIANILINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
4,4'-THIODIANILINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
O-TOLUIDINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
2,4-TOLYLENEDIAMINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
2,4,5-TRIMETHYLANILINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
O-ANISIDINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
5-NITRO-O-TOLUIDINE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
4-AMINOAZOBENZENE	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
2,4-Dimethylaniline	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
2,6-Dimethylaniline	GC-MS	35 LMBG		N.D.(< 5 mg/kg)
Formaldehyde	HPLC	ISO/TS 17226: 2003 (E)		N.D.(< 5 mg/kg)
PVC and PVC compound	Fourier transform Infrared Spectra	-		Not contain
Beryllium oxide	ICP-OES	-	N.D.(< 2 mg/kg)	N.D.(< 2 mg/kg)
Beryllium copper	ICP-OES	-	N.D.(< 2 mg/kg)	N.D.(< 2 mg/kg)
F	IC	EN 14582: 2016	No requested	N.D.(< 10 mg/kg)
Cl	IC	EN 14582: 2016		N.D.(< 10 mg/kg)
Br	IC	EN 14582: 2016		N.D.(< 10 mg/kg)
I	IC	EN 14582: 2016		N.D.(< 10 mg/kg)
Sb	ICP-OES	GB/T 5121.12-2008	N.D.(< 2 mg/kg)	N.D.(< 2 mg/kg)

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DEHP	GC-MS	IEC62321-8(111/321/CD)	No requested	N.D.(< 10 mg/kg)
DBP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
BBP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DINP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DIDP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DNOP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DNHP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DIBP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DIHP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DHNUP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
DMEP	GC-MS	IEC62321-8(111/321/CD)		N.D.(< 10 mg/kg)
HFC	-	-		-
HFC-23	GC-MS	EPA8260B	No requested	N.D.(< 1 mg/kg)
HFC-32	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-41	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-43-10mee	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-125	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-134	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-134a	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-143	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-143a	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-152a	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-227ea	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-236fa	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-236ea	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-245ea	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-245fa	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
HFC-365mfc	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
PFC	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
F14	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
Fluorocarbon 116	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
Freon 218	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
Decafluorobutane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
Freon C318	GC-MS	EPA8260B		N.D.(< 1 mg/kg)

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			Sample 1	Sample 2
Perfluor-1-butane	GC-MS	EPA8260B	No requested	N.D.(< 1 mg/kg)
perfluorisobutane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
1,4-dihydroctafluorobutane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
nonafluor-2-(trifluoromethyl)butane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
perfluoro-n-pentane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
2-perfluoromethylpentane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
perfluorohexane	GC-MS	EPA8260B		N.D.(< 1 mg/kg)
UV320(Specific benzotriazole)	GC-MS	-		N.D.(< 1 mg/kg)
Cobalt dichloride	ICP-OES	-		N.D. (< 2 mg/kg)
Ozonosphere destroy substance	-	-		-
CFCs	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
Carbon Tetrachloride	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
1,1,1-Trichloroethane	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
Halons	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
HCFCs	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
Bromomethane	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
HBFCs	GC-MS	EPA8260B		N.D.(< 10 mg/kg)
PFOS	LC-MS-MS	CEN/TS 15968:2010	N.D(<0.01 mg/kg)	N.D(<0.01 mg/kg)
PFOA	LC-MS-MS	CEN/TS 15968:2010	N.D(<0.01 mg/kg)	N.D(<0.01 mg/kg)
DMF	GC	-	No requested	N.D. < 10 mg/kg)
TCEP	GC-MS	EPA 3540C		N.D.(< 10 mg/kg)
HBCDD	GC-MS	EPA 3540C		N.D.(< 10 mg/kg)
Diarsenic trioxide, Diarsenic pentaoxide	ICP-OES	EPA3052		N.D.(< 2 mg/kg)
Boric acid, specific sodium borates	ICP-OES	EPA3052		N.D.(< 2 mg/kg)
4-(1,1,3,3-tetramethylbutyl)phenol	GC-MS	EPA 3540C		N.D.(< 50 mg/kg)
Bis(2-methoxyethyl)ether-d14	GC-MS	EPA 3540C		N.D.(< 50 mg/kg)
DMAC	GC-MS	EPA 3540C		N.D.(< 50 mg/kg)
EGDME	GC-MS	EPA 3540C		N.D.(< 50 mg/kg)

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REMARK:

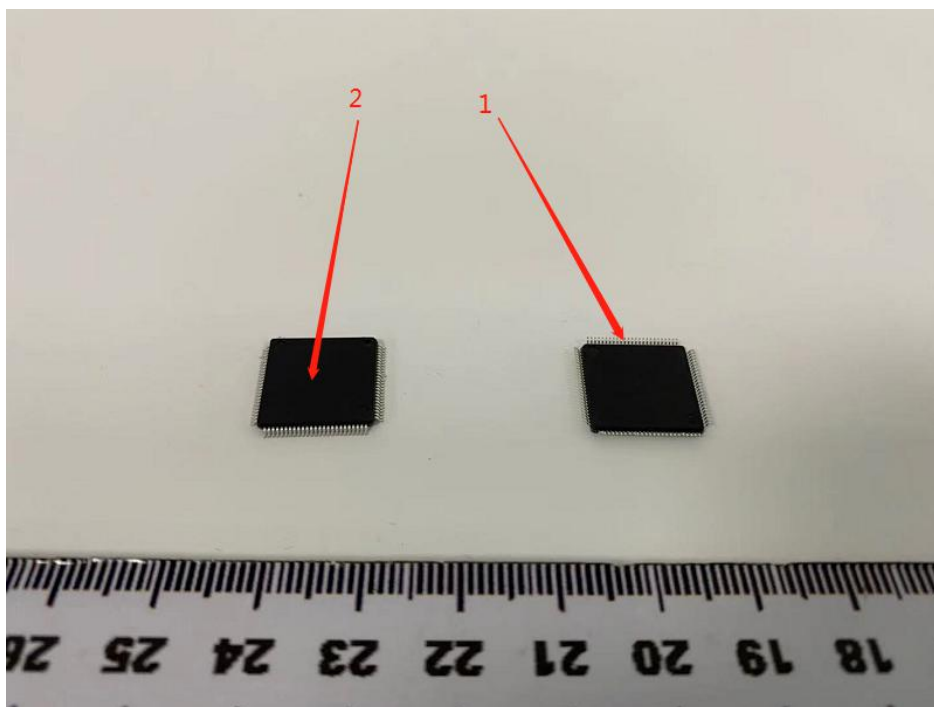
= Testing Cr^{6+} by IEC 62321:2008 Annex B and the result is showed as Positive/Negative

Negative = Absence of Cr^{6+} , which means that the Cr^{6+} concentration in extraction solution is less than 0.02 mg/kg with 50 cm^2 sample surface area

Positive = Presence of Cr^{6+} , which means that the Cr^{6+} concentration in extraction solution is equal or greater than 0.02 mg/kg with 50 cm^2 sample surface area

mg/kg = ppm ; ND = Not detected

Sample photo

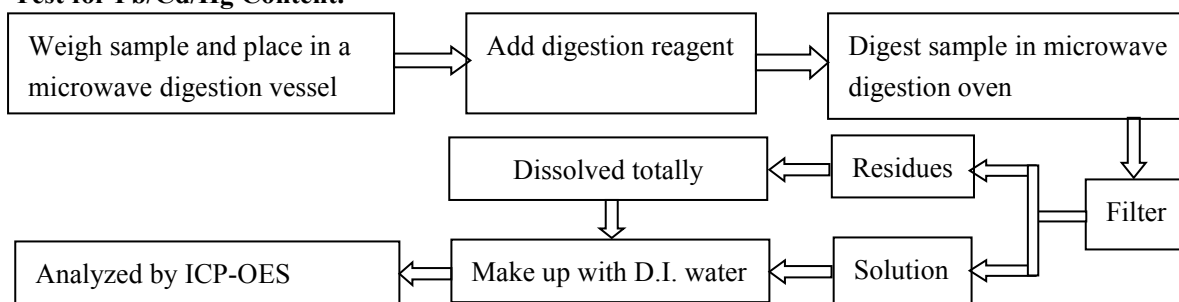


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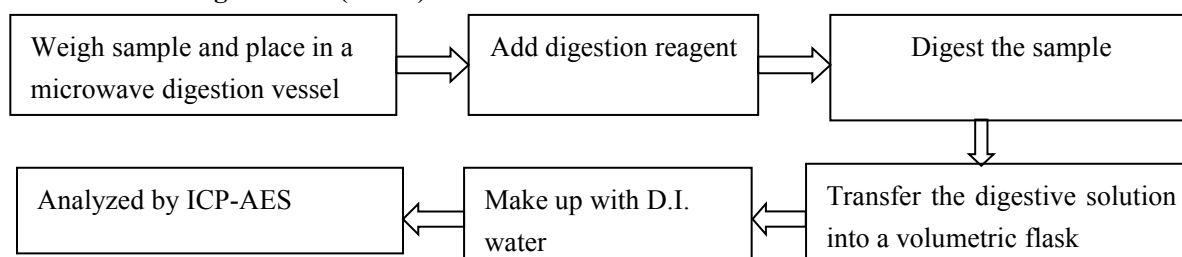
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Test Process:

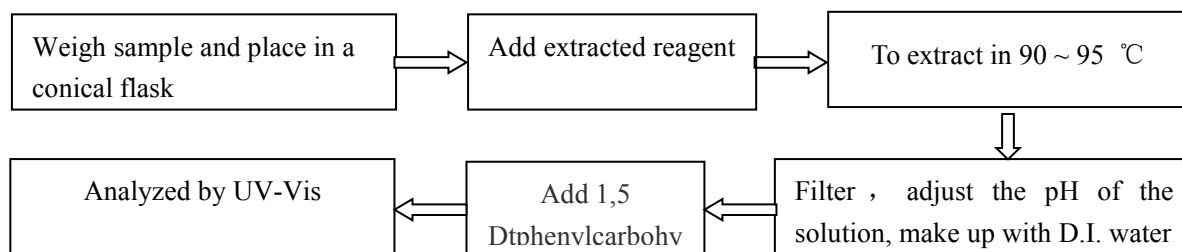
Test for Pb/Cd/Hg Content.



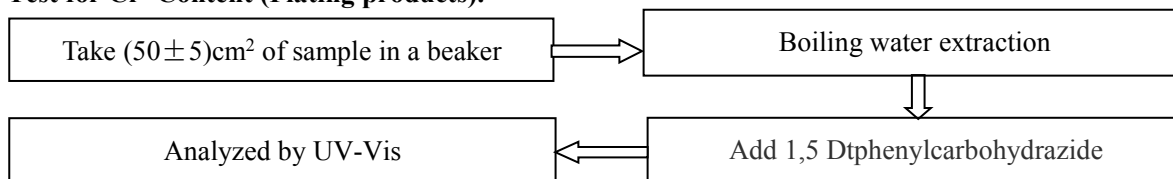
Test for Pb/Cd/Hg Content (Metal).



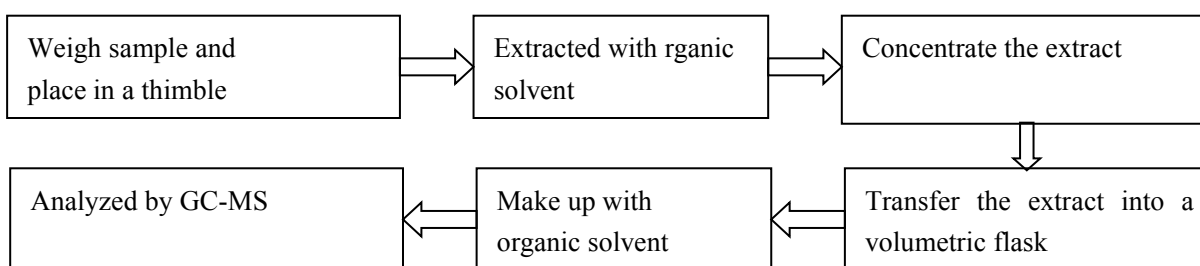
Test for Cr⁶⁺ Content.



Test for Cr⁶⁺ Content (Plating products).



Test for PBBs /PBDEs Content.

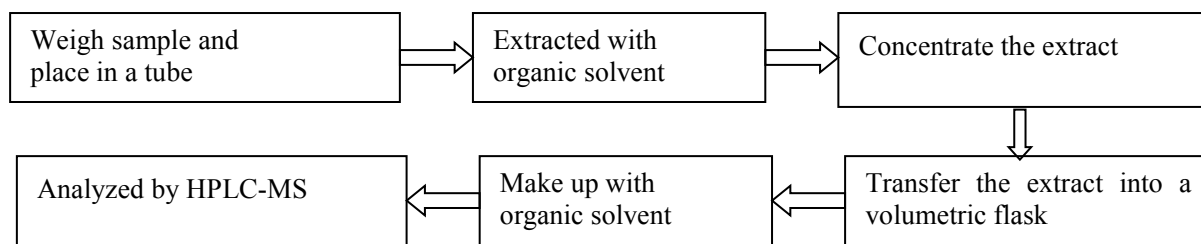


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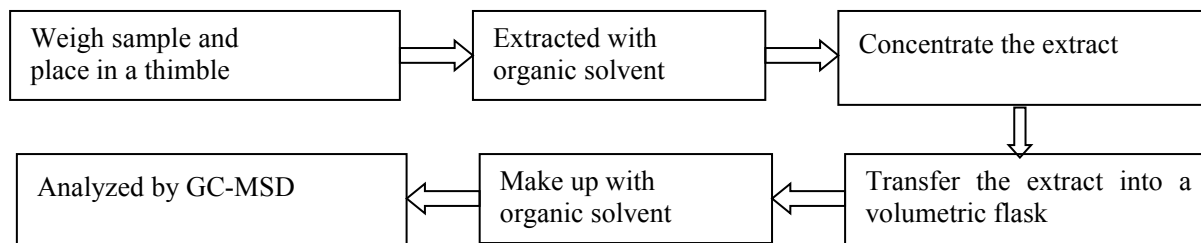
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Test Process :

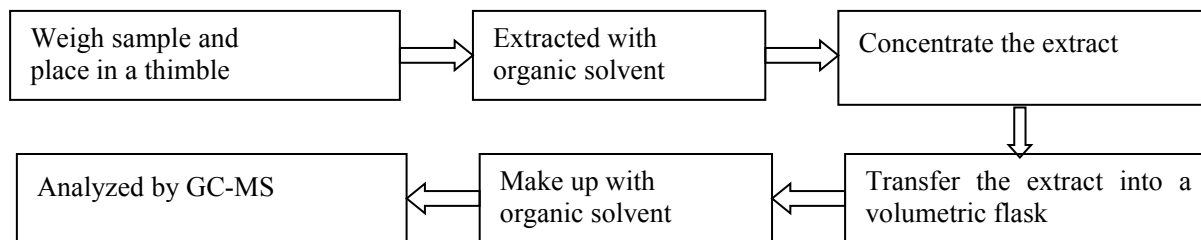
Test for PFOA, PFOS Content.



Test for phthalates Content.



Test for Dimethyl fumarate Content.



*****End of Report*****