Test Report No. F690101/LF-CTSAYAA25-19004

Issued Date : 2025. 05. 02

MK ELECTRON CO., LTD.
405 Geumeo-ro, Pogok-eup
Cheoin-gu Yongin-si, Gyeonggi-do
Korea

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

SGS File No.	: AYAA25-19004
Product Name	: COPPER WIRE
Item No./Part No.	: N/A
Received Date	: 2025. 04. 24
Test Period	: 2025. 04. 24 to 2025. 05. 02
Test Results	: For further details, please refer to following page(s)

Monet Jeong

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Technical Manager / SGS Korea Co., Ltd

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Sample No. : AYAA25-19004.001
Sample Description : COPPER WIRE
Item No./Part No. : N/A
Materials : N/A

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013+AMD1:2017CSV, by ICP-OES	2	N.D.
Hexavalent Chromium (Cr VI)++	μg/cm²	With reference to IEC 62321-7-1 : 2015, by UV-Vis	0.1	N.D.

Total Metals

Test Items	Unit	Test Method	MDL	Results
Arsenic (As)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	10	N.D.
Beryllium (Be)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	5	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	10	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

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Materials : N/A

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

Phthalates

Test Items	Unit	Test Method	MDL	Results
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-hexyl phthalate (DNHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C6-C8 alkyl)phthalate] branched (DIHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C7-C11 alkyl)phthalate] linear and branched (DHNUP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.

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Item No./Part No. : N/A
Materials : N/A

Chlorinated Paraffin

Test Items	Unit	Test Method	MDL	Results
Alkanes, C10~13, Short Chain Chlorinated Paraffins(SCCP)	mg/kg	With reference to ISO 18219, by GC-MS(CI)	50	N.D.

Chlorinated Organic Substances

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Naphthalene (PCN)	mg/kg	With reference to US EPA 8081 A(US EPA 3550C), by GC/MS	5	N.D.

PCBs & PCTs

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Biphenyls (PCBs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.
Polychlorinated terphenyls (PCTs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.

Polymer Identification

Test Items	Unit	Test Method	MDL	Results
PVC	**	FT-IR	-	Negative

Halogen Content

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Chlorine(Cl)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Fluorine(F)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Iodine(I)	mg/kg	With reference to BS EN 14582 : 2016, by IC	50	N.D.

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Sample No. : AYAA25-19004.001
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Item No./Part No. : N/A
Materials : N/A

Organotin Compounds

Test Items	Unit	Test Method	MDL	Results
Dibutyltin (DBT)	mg/kg	with reference to ISO 17353:2004, by GC/MS	1	N.D.
Tributyltin (TBT)	mg/kg	with reference to ISO 17353:2004, by GC/MS	1	N.D.
Bis (tributyltin)oxide (TBTO)	mg/kg	with reference to ISO 17353:2004, by GC/MS	1	N.D.
Triphenyltin (TPhT)	mg/kg	with reference to ISO 17353:2004, by GC/MS	1	N.D.
Dioctyltin (DOT)	mg/kg	with reference to ISO 17353:2004, by GC/MS	1	N.D.

PFAS (Per-and polyfluoroalkyl substances)

Test Items	Unit	Test Method	MDL	Results
Perfluorootanoic acid (PFOA)	µg/kg	with reference to EN 17681-1:2022, HPLC/MS/MS	10	N.D.
Perfluorooctanesulfonic Acid (PFOS)	µg/kg	with reference to EN 17681-1:2022, HPLC/MS/MS	10	N.D.

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Hexabromocyclododecane (HBCDD)	mg/kg	with reference to IEC 62321-9, by GC/MS	5	N.D.

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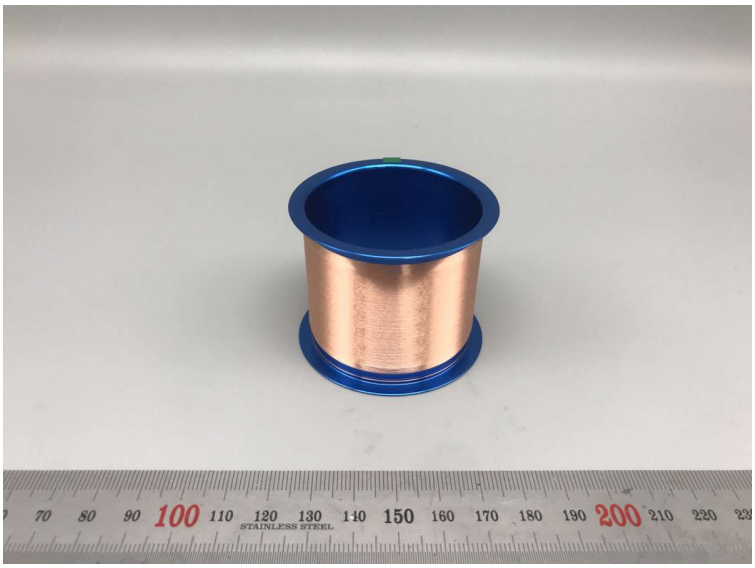
NOTE: (1) N.D. = Not detected. (<MDL)
(2) mg/kg = ppm, ug/kg = ppb, mg/L = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable
(7) + = a. The result of Hexavalent Chromium (Cr(VI)) is “ND” as the result of Chromium (Cr) is “ND”, and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
b. If the content of Total Chromium (Cr) is greater than the MDL of Hexavalent Chromium (Cr(VI)), it is the result of hexavalent Chromium by UV-VIS.
(8) ++= a. The sample is positive for Cr VI if the Cr VI concentration is greater than 0.13 ug/cm2. The sample coating is considered to contain Cr VI.
b. The sample is negative for Cr VI if Cr VI is ND(concentration less than 0.10 ug/cm2). The coating is considered a non-Cr VI based coating.
c. The result between 0.10 ug/cm2 and 0.13 ug/cm2 is considered to be inconclusive – unavoidable coating variations may influence the determination.

Picture of Sample as Received:



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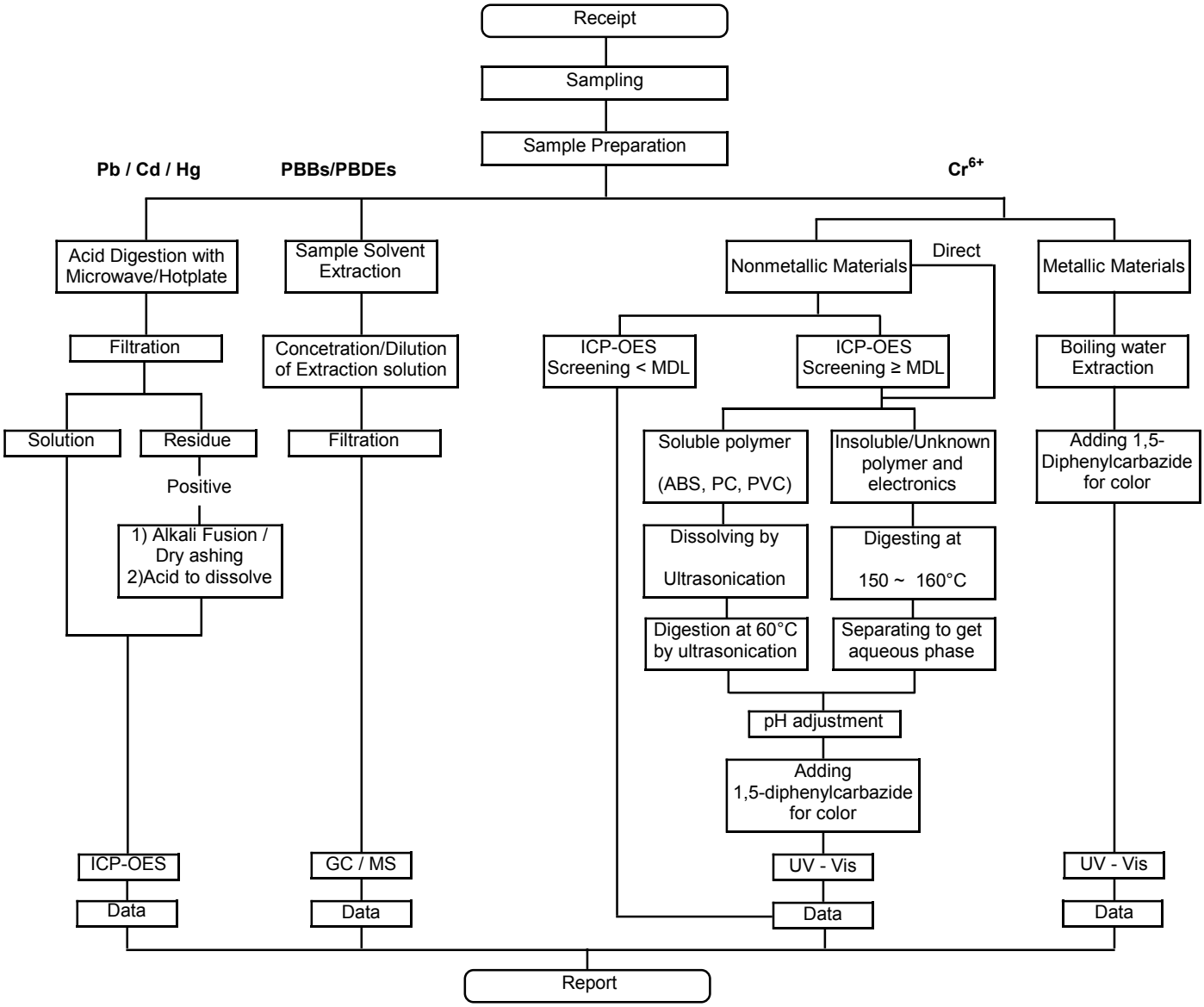
Flow Chart for RoHS Pb / Cd / Hg / Cr^{6+} / PBBs&PBDEs Test



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd, Pb, Hg.

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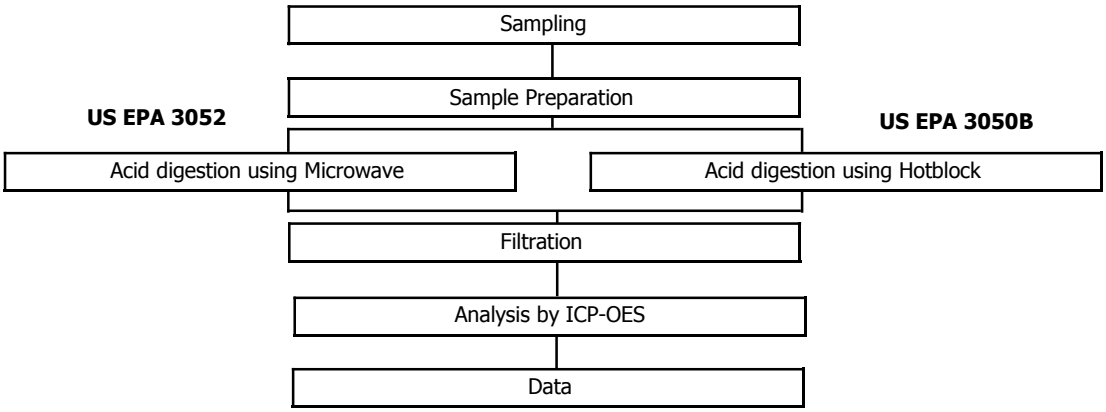
Flow Chart for Heavy metal



Major Inorganic Heavy Metals	Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc.

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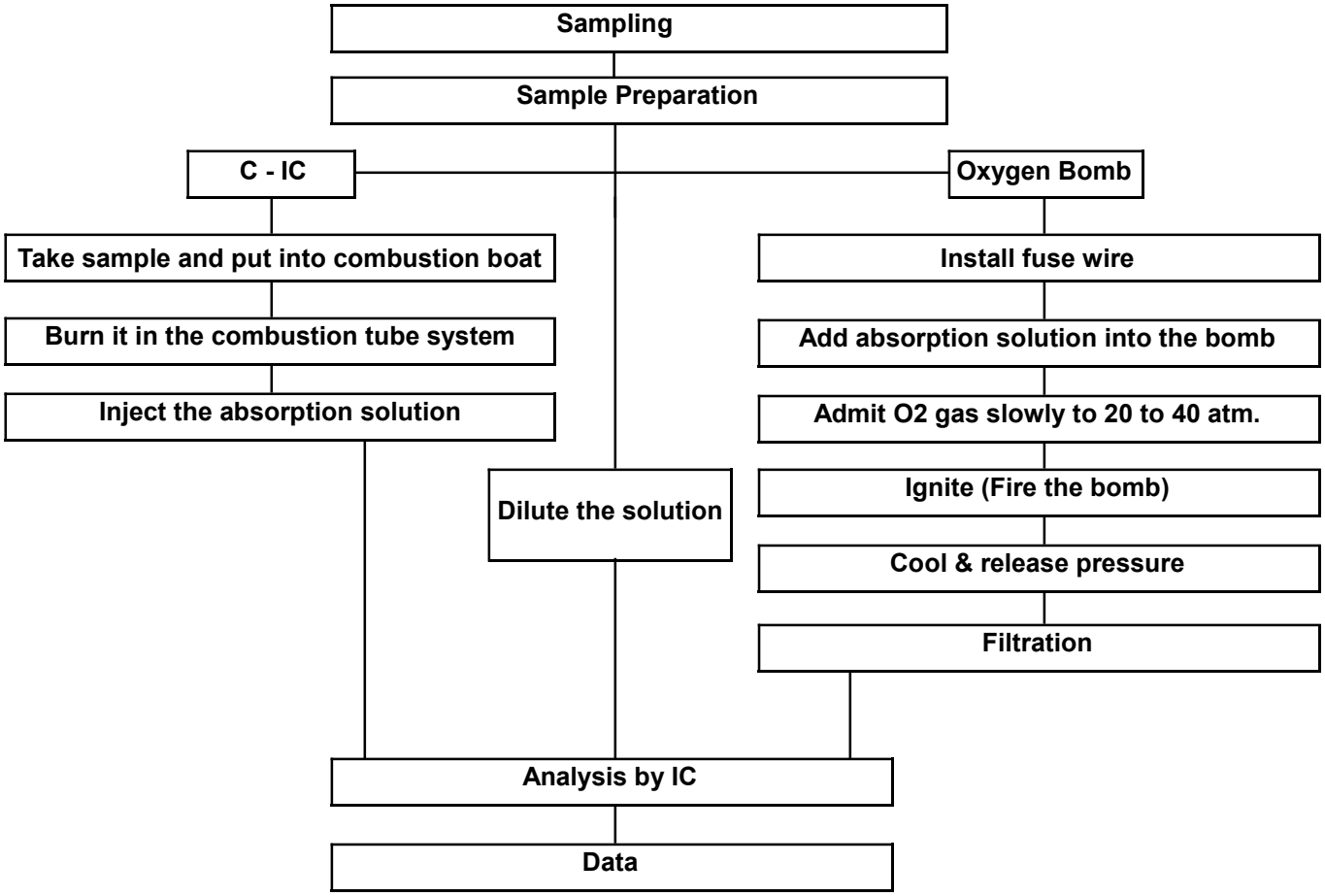
Flow Chart for Halogen Test



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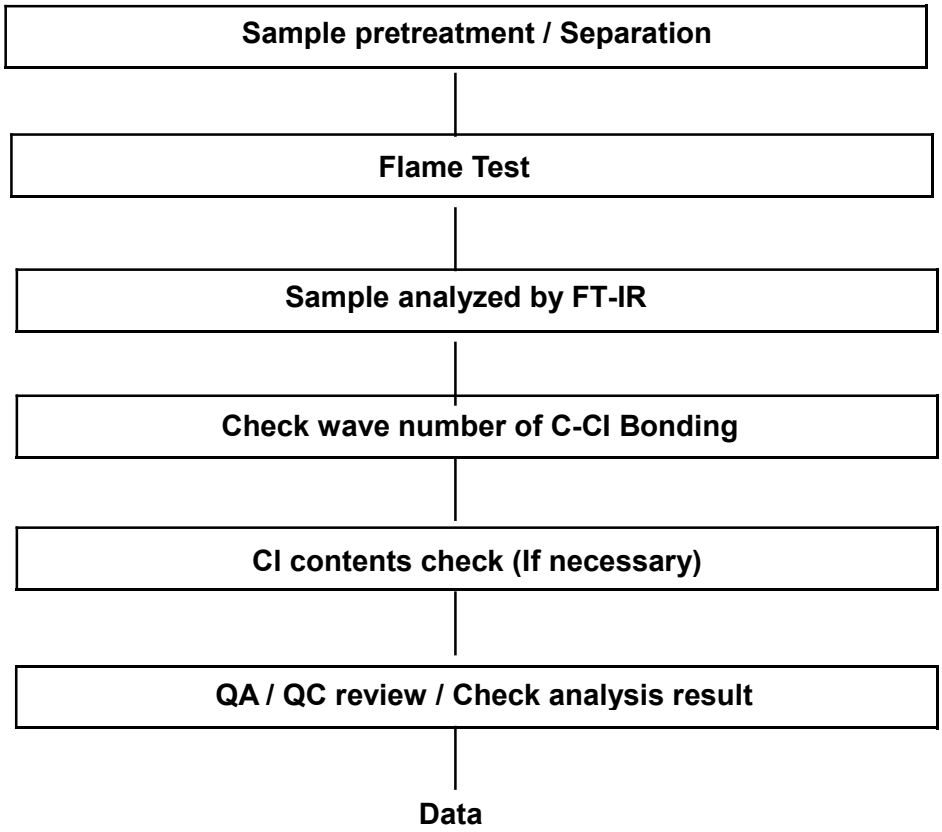
Flow Chart for PVC Test



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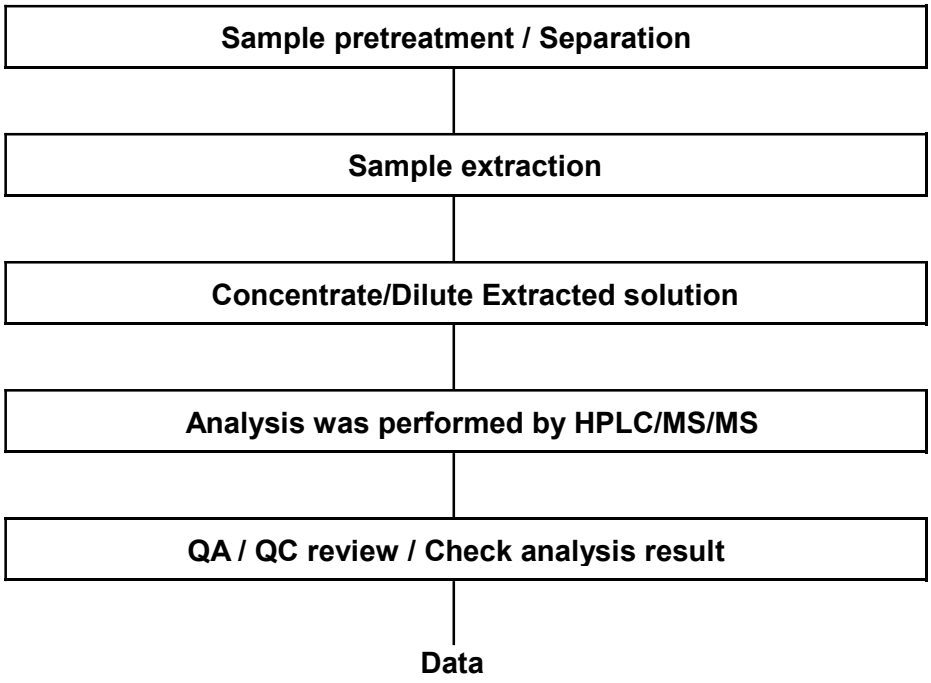
Flow Chart for PFOS/PFOA Test



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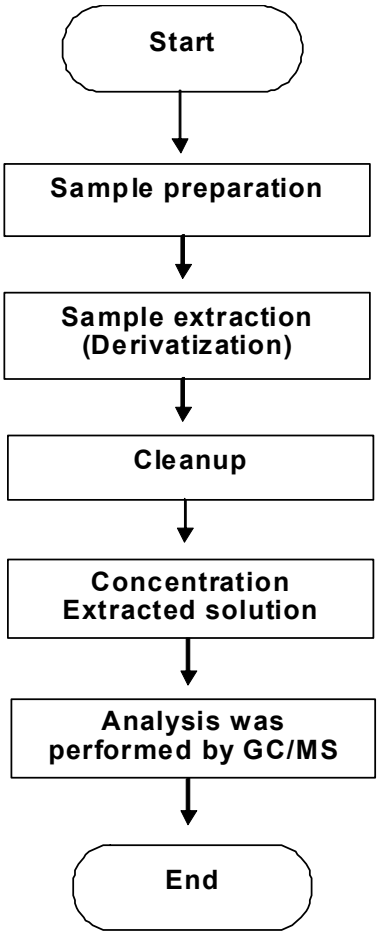
Organotin Flow Chart



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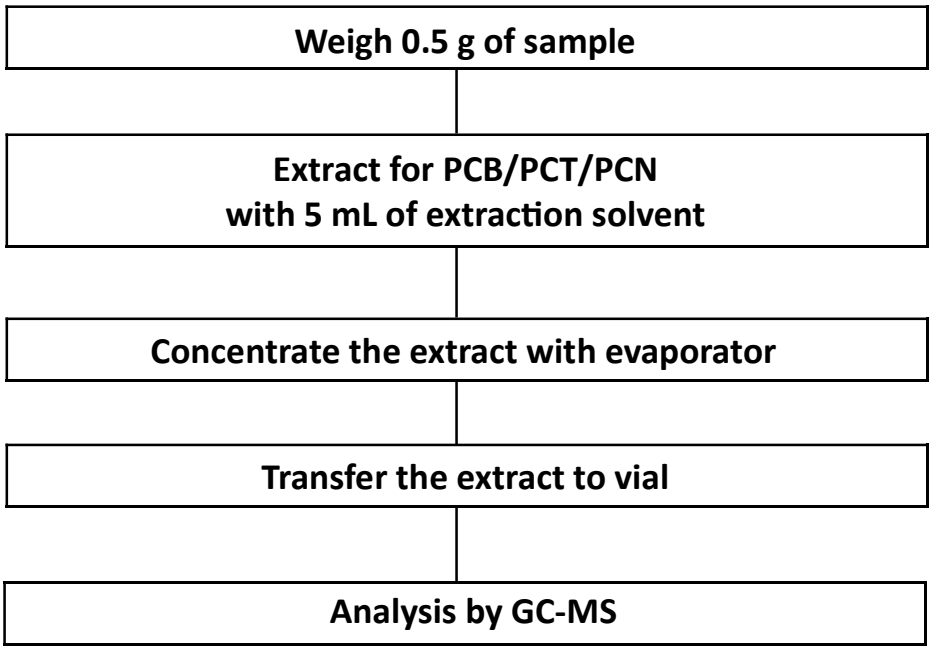
Flow Chart for (PCB/PCT/PCN)



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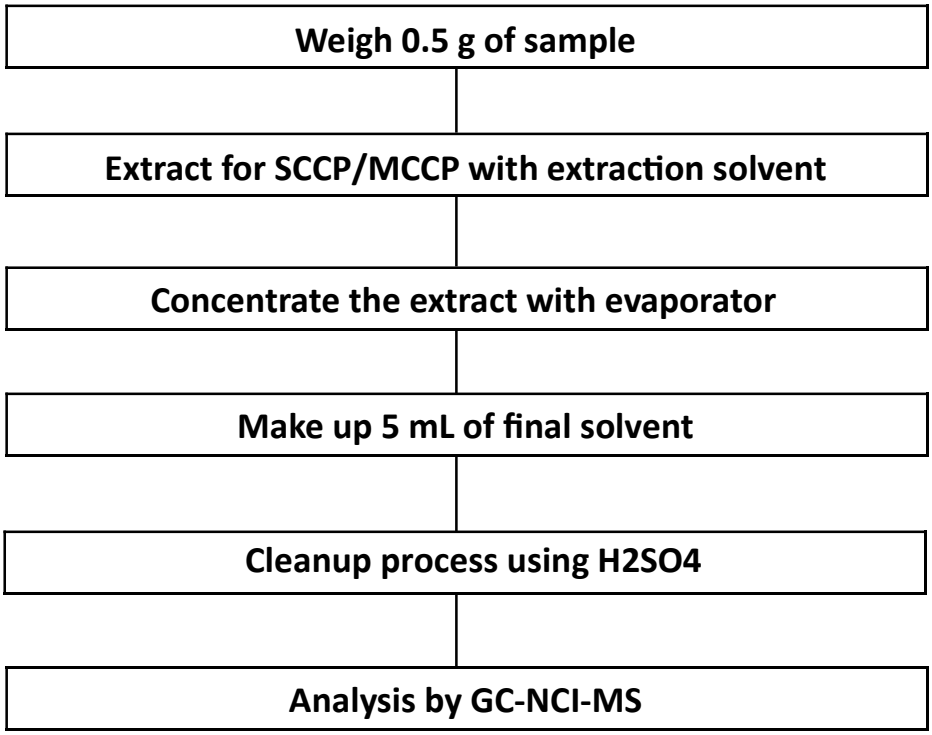
Flow Chart for SCCP/MCCP



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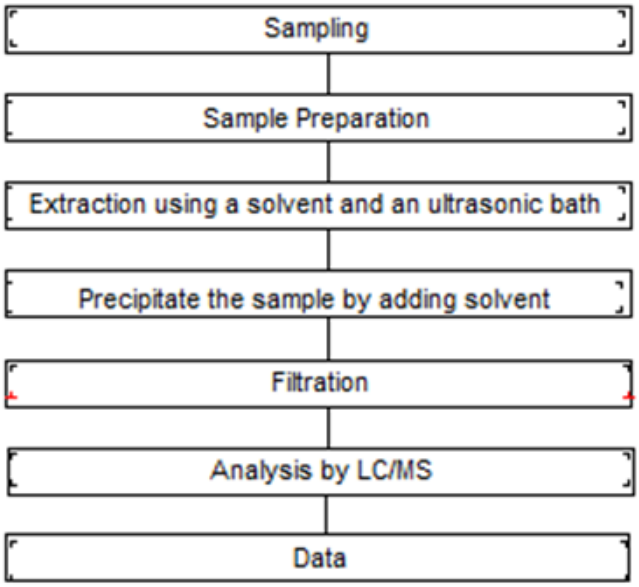
Testing Flow Chart for HBCD



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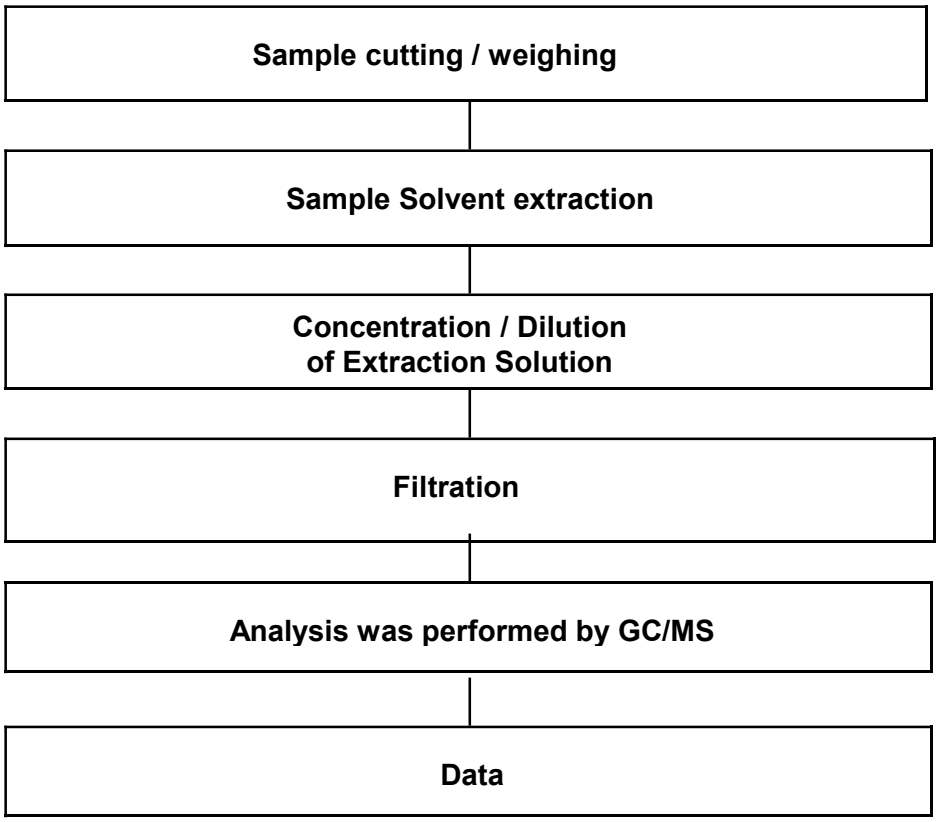
Flow Chart for PhthalateTest



*** End of Report ***

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