

## TEST REPORT (测试报告件)

申请公司(APPLICANT) : SAMSUNG ELECTRO-MECHANICS  
公司住所(ADDRESS) : 150, Maeyeong-ro, Yeongtong-gu,  
Suwon-si, Gyeonggi-do, Korea

报告号(REPORT NO.) : RT19R-S4740-039-C

日期(DATE) : 2019 年 11 月 06 日

样品描述(SAMPLE DESCRIPTION) :

样品名称 : MLCC A(X5R) J(JIS-B) X(X6S) TYPE  
(NAME/TYPE OF PRODUCT)  
样品编号 : RT19R-S4740-039  
(SAMPLE ID NO.)  
生产商/贸易商 : SAMSUNG ELECTRO-MECHANICS  
(MANUFACTURER/VENDOR)  
样品收到日期 : 2019年 10月23日  
(SAMPLE RECEIVED)  
测试进行日期 : 2019年 10月23日至 2019年 11月05日  
(TESTING DATE)  
测试方法 : 参考续页.  
(TEST METHOD(S)) : Please see the following page(s).  
测试结果 : 参考续页.  
(TEST RESULT(S)) : Please see the following page(s).

注1 : 检测结果只是针对来样所做的测试.  
(Note 1 : The test results presented in this report relate only to the object tested.)

注2 : 未经测试实验室书面允许, 报告不能被部分复制.  
(Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.)

注3 : 此报告所测试项目并不属于KOLAS 认证范围内.  
(Note 3 : This report is not related to the scope of Korea laboratory accreditation scheme.)

测试 (Approved by) :



Jade Jang / 测试负责人

批准 (Authorized by) :



Bo Park / 实验室经理



Authenticity check

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9550 Fax : 02-3409-0025 Web Site : [intertek.co.kr](http://intertek.co.kr)

Seoul Lab. Address : 7, Ahasan-ro 5-gil, Seongdong-gu, Seoul, 04793 Korea

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 样品名称(SAMPLE DESCRIPTION) : MLCC A(X5R) J(JIS-B) X(X6S) TYPE

| 测试项目<br>(TEST ITEM)                          | 单位<br>(UNIT) | 测试方法<br>(TEST METHOD)   | 报告限量值<br>(MDL) | 结果<br>(RESULT) |
|--|--------------|---|----------------|----------------|
| 镉 (Cadmium, Cd)                              | mg/kg        | 参照 IEC 62321-5<br>Edition 1.0 : 2013,<br>用 ICP-OES 进行的分析  | 0.5            | N.D.           |
| 铅 (Lead, Pb)                                 | mg/kg        |   | 5              | N.D.           |
| 汞 (Mercury, Hg)                              | mg/kg        | 参照 IEC 62321-4<br>Edition 1.0 : 2013,<br>用 ICP-OES 进行的分析  | 2              | N.D.           |
| 六价铬 (Hexavalent Chromium, Cr <sup>6+</sup> ) | mg/kg        | 参照 IEC 62321-7-2<br>Edition 1.0 : 2017, by<br>alkaline/toluene digestion 用<br>UV-VIS Spectrophotometer<br>进行的分析 | 8              | N.D.           |
| 多溴联苯 (Polybrominated Biphenyl, PBBs)         |              |   |                |                |
| 一溴联苯 (Monobromobiphenyl)                     | mg/kg        | 参照 IEC 62321-6<br>Edition 1.0 : 2015,<br>用 GC/MS 进行的分析  | 5              | N.D.           |
| 二溴联苯 (Dibromobiphenyl)                       | mg/kg        |   | 5              | N.D.           |
| 三溴联苯 (Tribromobiphenyl)                      | mg/kg        |   | 5              | N.D.           |
| 四溴联苯 (Tetrabromobiphenyl)                    | mg/kg        |   | 5              | N.D.           |
| 五溴联苯 (Pentabromobiphenyl)                    | mg/kg        |   | 5              | N.D.           |
| 六溴联苯 (Hexabromobiphenyl)                     | mg/kg        |   | 5              | N.D.           |
| 七溴联苯 (Heptabromobiphenyl)                    | mg/kg        |   | 5              | N.D.           |
| 八溴联苯 (Octabromobiphenyl)                     | mg/kg        |   | 5              | N.D.           |
| 九溴联苯 (Nonabromobiphenyl)                     | mg/kg        |   | 5              | N.D.           |
| 十溴联苯 (Decabromobiphenyl)                     | mg/kg        |   | 5              | N.D.           |
| 多溴联苯醚 (Polybrominated Diphenyl Ether, PBDEs) |              |   |                |                |
| 一溴联苯醚 (Monobromodiphenyl ether)              | mg/kg        | 参照 IEC 62321-6<br>Edition 1.0 : 2015,<br>用 GC/MS 进行的分析  | 5              | N.D.           |
| 二溴联苯醚 (Dibromodiphenyl ether)                | mg/kg        |   | 5              | N.D.           |
| 三溴联苯醚 (Tribromodiphenyl ether)               | mg/kg        |   | 5              | N.D.           |
| 四溴联苯醚 (Tetrabromodiphenyl ether)             | mg/kg        |   | 5              | N.D.           |
| 五溴联苯醚 (Pentabromodiphenyl ether)             | mg/kg        |   | 5              | N.D.           |
| 六溴联苯醚 (Hexabromodiphenyl ether)              | mg/kg        |   | 5              | N.D.           |
| 七溴联苯醚 (Heptabromodiphenyl ether)             | mg/kg        |   | 5              | N.D.           |
| 八溴联苯醚 (Octabromodiphenyl ether)              | mg/kg        |   | 5              | N.D.           |
| 九溴联苯醚 (Nonabromodiphenyl ether)              | mg/kg        |   | 5              | N.D.           |
| 十溴联苯醚 (Decabromodiphenyl ether)              | mg/kg        |   | 5              | N.D.           |

Tested by : Jooyeon Lee, Seulgi Park, Miseon Lee

注释 (Notes) : mg/kg = ppm = 百万分之一 (parts per million)  
 <= 小于 (Less than)  
 N.D.= 未检出 (Not detected (<MDL))  
 MDL = 报告限量值 (Method detection limit)



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| 测试项目<br>(TEST ITEM)            | 单位<br>(UNIT) | 测试方法<br>(TEST METHOD)                        | 报告限量值<br>(MDL) | 结果<br>(RESULT) |
|--------------------------------|--------------|--|----------------|----------------|
| 溴 (Bromine, Br)                | mg/kg        | 参考 EN 14582, IC 测试定量                         | 30             | N.D.           |
| 氯 (Chlorine, Cl)               | mg/kg        | 参考 EN 14582, IC 测试定量                         | 30             | N.D.           |
| 砷 (Arsenic, As)                | mg/kg        | 参考 US EPA 3052,<br>酸消化法处理样品,<br>ICP-OES 测试定量 | 2              | N.D.           |
| 铍 (Beryllium, Be)              | mg/kg        | 参考 US EPA 3052,<br>酸消化法处理样品,<br>ICP-OES 测试定量 | 2              | N.D.           |
| 锑 (Antimony, Sb)               | mg/kg        | 参考 US EPA 3052,<br>酸消化法处理样品,<br>ICP-OES 测试定量 | 2              | N.D.           |
| 聚氯乙烯 (Polyvinyl chloride, PVC) | -            | 参考 KS K 0210-1,<br>FT-IR 测试定量                | N.A.           | Negative       |

Tested by : Hyojoo Kim, Jooyeon Lee

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 N.A. = 不适用 (Not applicable)  
 Negative = Undetectable  
 Positive = Detectable



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|---|--------------|---|----------------|----------------|
| 六溴环十二烷<br>(Hexabromocyclododecane, HBCDD) | mg/kg        | 参考 IEC 62321-9(111/409/CD),<br>溶剂萃取法,<br>LC/MS 和 GC/MS 测试定量 | 10             | N.D.           |
| SCCP (Short-chain chlorinated paraffin)   | mg/kg        | 参考 US EPA 3540C,<br>溶剂萃取法,<br>LC/MS/MS 和/或 GC/ECD<br>测试定量   | 100            | N.D.           |
| PCBs (Polychlorinated biphenyls)          | mg/kg        | 参考 US EPA 3540C/8082,<br>溶剂萃取法,<br>GC/MS 测试定量               | 5              | N.D.           |
| PCTs (Polychlorinated terphenyls)         | mg/kg        | 参考 US EPA 3540C,<br>溶剂萃取法, GC/MS 测试定量                       | 5              | N.D.           |
| PCNs (Polychlorinated naphthalenes)       | mg/kg        | 参考 US EPA 3540C,<br>溶剂萃取法, GC/MS 测试定量                       | 5              | N.D.           |
| PCP (Pentachlorophenol)                   | mg/kg        | 参考 ISO 17070,<br>GC/MS 测试定量                                 | 5              | N.D.           |
| PFOA (Perfluorooctanoic acid)             | mg/kg        | 参考 US EPA 3550C/8321B,<br>超声萃取法,<br>LC/MS 或 LC/MS/MS 测试定量   | 0.1            | N.D.           |
| PFOS (Perfluorooctane sulfonate)          | mg/kg        | 参考 US EPA 3550C/8321B,<br>超声萃取法,<br>LC/MS 或 LC/MS/MS 测试定量   | 0.1            | N.D.           |

Tested by : Miseon Lee

注释 (Notes) : mg/kg = ppm = 百万分之一 (parts per million)

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| 测试项目<br>(TEST ITEM)   | CAS 数<br>(CAS NO.)       | 单位<br>(UNIT) | 测试方法<br>(TEST METHOD)   | 报告限量值<br>(MDL) | 结果<br>(RESULT) |
|---|--------------------------|--------------|---|----------------|----------------|
| 邻苯二甲酸酯 (Phthalates)   |                          |              |   |                |                |
| 邻苯二甲酸二丁酯<br>(Di-n-butyl Phthalate, DBP)   | 84-74-2                  | mg/kg        | 参考 IEC 62321-8<br>Edition 1.0 : 2017,<br>溶剂萃取法,<br>气相色谱/质谱联用仪<br>测试定量 | 50             | N.D.           |
| 邻苯二甲酸二(2-乙基己基)酯<br>(Di(2-ethyl hexyl) phthalate, DEHP)  | 117-81-7                 | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二辛酯<br>(Di-n-octyl phthalate, DNOP)  | 117-84-0                 | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二异壬酯<br>(Diisononyl phthalate, DINP)   | 28553-12-0<br>68515-48-0 | mg/kg        |   | 100            | N.D.           |
| 邻苯二甲酸二异葵酯<br>(Diisodecyl phthalate, DIDP)   | 26761-40-0<br>68515-49-1 | mg/kg        |   | 100            | N.D.           |
| 邻苯二甲酸丁酯苯甲酯<br>(Benzyl butyl phthalate, BBP)   | 85-68-7                  | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二异丁酯<br>(Diisobutyl phthalate, DIBP)   | 84-69-5                  | mg/kg        |   | 50             | N.D.           |
| 酞酸二甲酯<br>(Dimethyl phthalate, DMP)  | 131-11-3                 | mg/kg        |   | 50             | N.D.           |
| 酞酸二乙酯<br>(Diethyl phthalate, DEP)   | 84-66-2                  | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二戊酯<br>(Di-n-pentyl phthalate, DPP)  | 131-18-0                 | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二己酯<br>(Di-n-hexyl phthalate, DNHP)  | 84-75-3                  | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二 C6-8 支链烷基酯(富 C7)<br>(1,2-Benzenedicarboxylic acid,<br>di-C6-8-branched alkyl esters,<br>C7-rich, DIHP) | 71888-89-6               | mg/kg        |   | 50             | N.D.           |

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|--|--------------------|--------------|---|----------------|----------------|
| 1,2-邻苯二酸二(C7-11 支鏈與直鏈)烷酯<br>(1,2-Benzenedicarboxylic acid,<br>di-C7-11-branched and linear<br>alkyl esters, DHNUP) | 68515-42-4         | mg/kg        | 参考 IEC 62321-8<br>Edition 1.0 : 2017,<br>溶剂萃取法,<br>气相色谱/质谱联用仪<br>测试定量 | 50             | N.D.           |
| 邻苯二甲酸二甲氧乙酯<br>(Di(2-methoxyethyl) phthalate, DMEP)   | 117-82-8           | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸二异戊酯<br>(Diisopentylphthalate, DIPP)  | 605-50-5           | mg/kg        |   | 50             | N.D.           |
| 邻苯二甲酸正戊基异戊基酯<br>(N-pentyl-isopentylphthalate, NPIP)  | 776297-69-9        | mg/kg        |   | 50             | N.D.           |

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\* 样品相片;-  
(View of sample as received;-)



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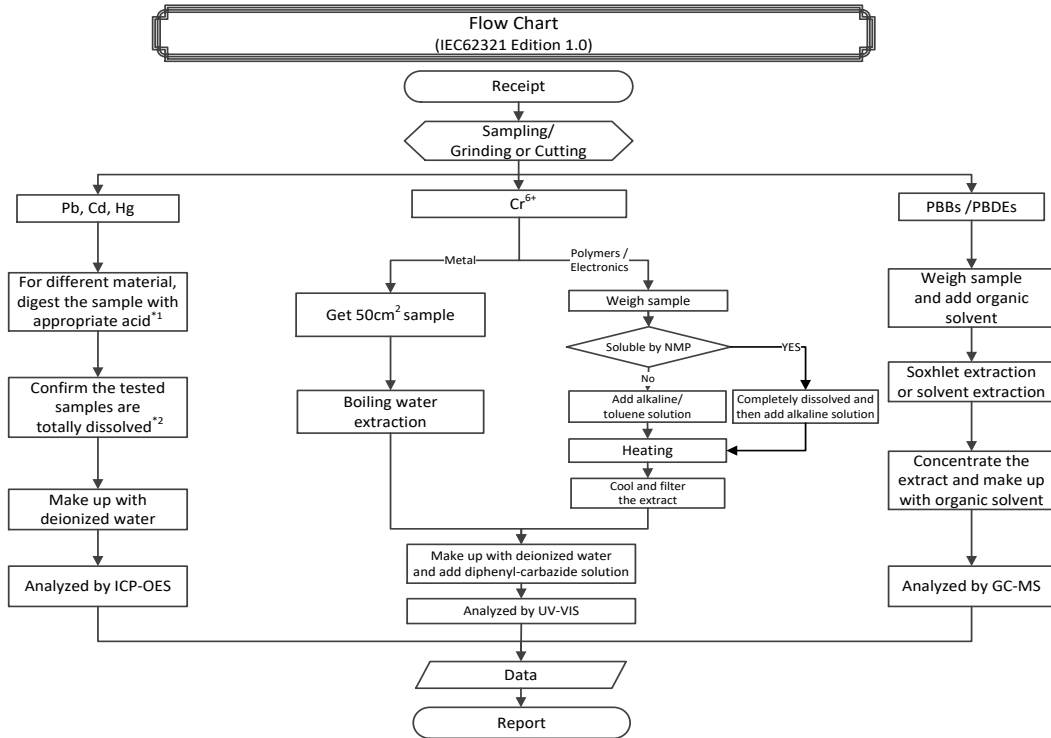
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Remarks :

\*1 : List of appropriate acid :

| Material    | Acid added for digestion   |
|-------------|--|
| Polymers    | HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub> |
| Metals      | HNO <sub>3</sub> , HCl, HF   |
| Electronics | HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>                   |

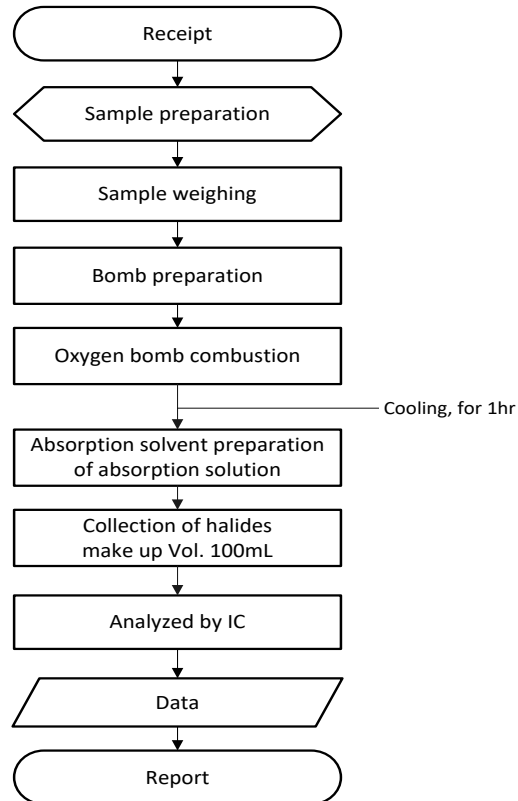
\*2 : The samples were dissolved totally by pre-conditioning method according to above flow chart.



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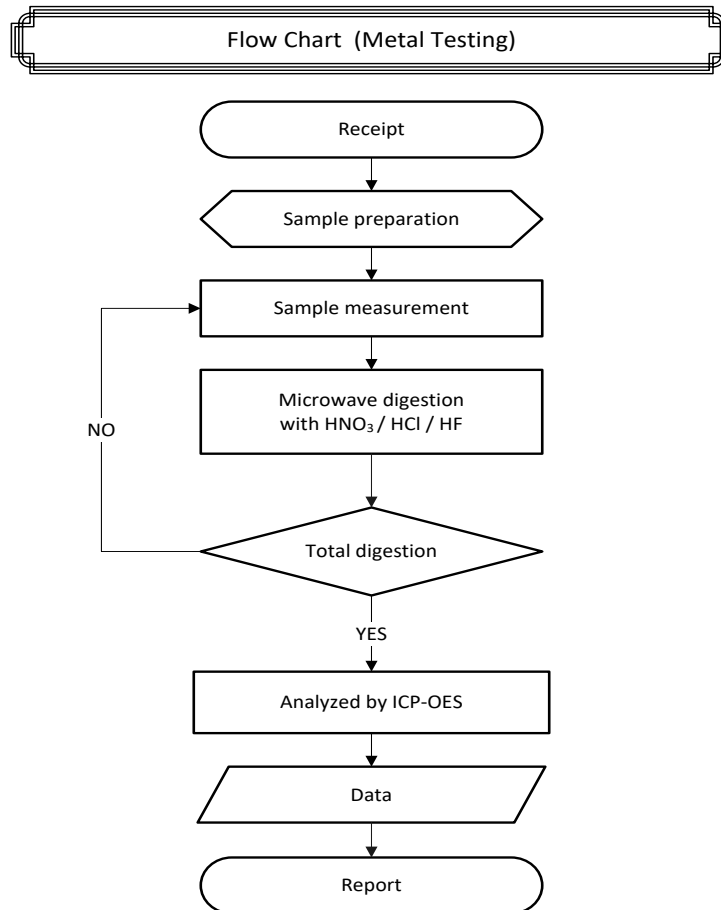
## Flow Chart (EN14582)





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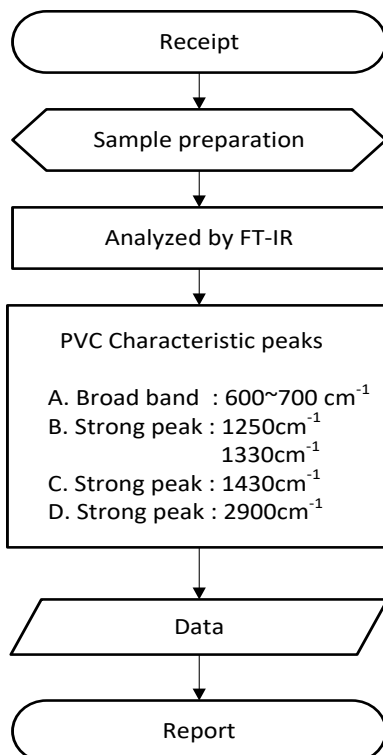
\*\* Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.



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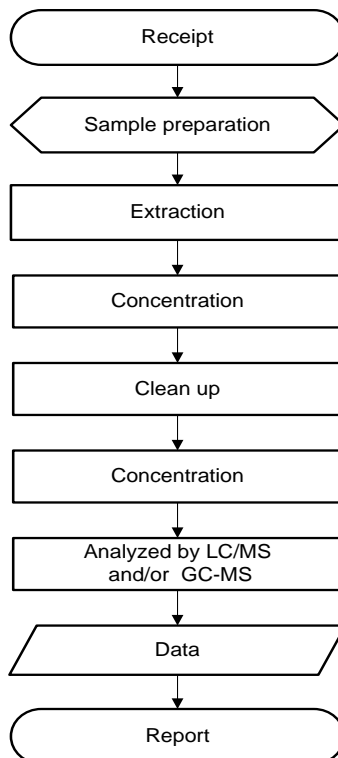
## Flow Chart (PVC)



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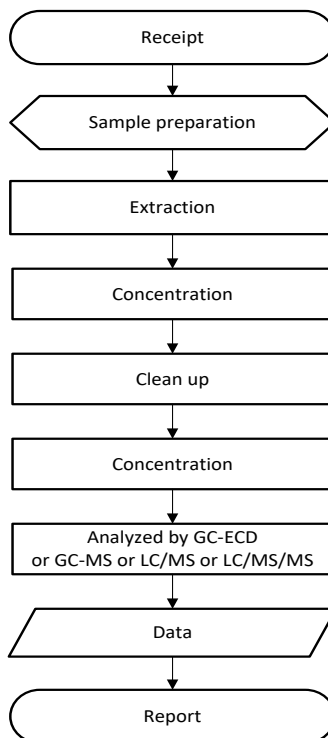
## Flow Chart (HBCDD)



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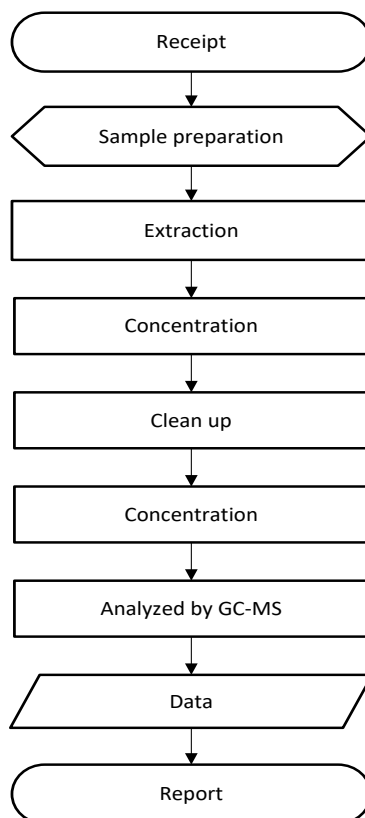
## Flow Chart (EPA 3540C)



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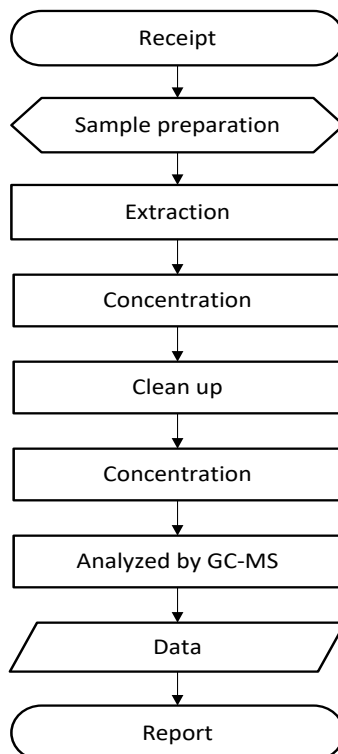
## Flow Chart (PCB, PCT, PCN)



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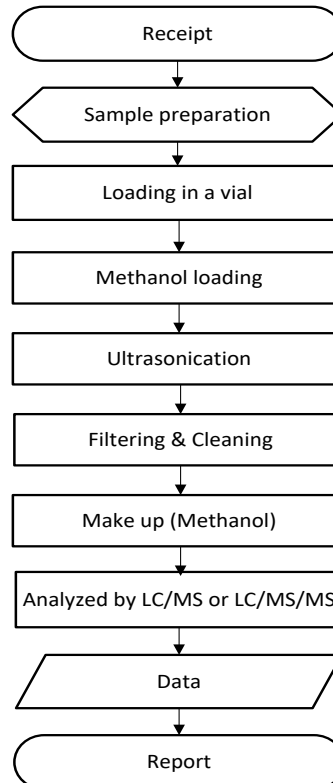
## Flow Chart (PCP)



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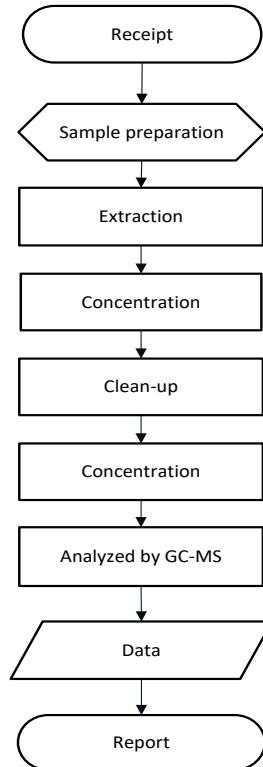
## Flow Chart (PFOS, PFOA)



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## Flow Chart (Phthalates)



\*\*\*\*\* 报告结束 \*\*\*\*\*

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