

檢測報告 Test Report



報告編號 A2230172619101001E
Report No. A2230172619101001E

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報告抬頭公司名稱 日月光半導體製造股份有限公司
Company Name ADVANCED SEMICONDUCTOR ENGINEERING, INC.
shown on Report

地址 高雄市楠梓區經三路26號
Address 26. CHIN 3RD RD., NANZIH DIST., KAOHSIUNG, TAIWAN 811

以下測試之樣品及樣品資訊由申請者提供並確認

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

樣品名稱 電鍍銅
Sample Name Plating copper
樣品接收日期 2023.04.17
Sample Received Date Apr. 17, 2023
樣品檢測日期 2023.04.17-2023.04.24
Testing Period Apr. 17, 2023 to Apr. 24, 2023

檢測要求 根據客戶要求, 對所提交樣品中的鉛(Pb), 鎘(Cd), 汞(Hg), 六價鉻(Cr(VI)), 多溴聯苯(PBBs), 多溴二苯醚(PBDEs), 鄰苯二甲酸酯(DBP, BBP, DEHP, DIBP), 氟(F), 氯(Cl), 溴(Br), 碘(I), 鄰苯二甲酸酯, 有機錫, 銻(Sb), 鉍(Be), 六溴環十二烷(HBCDD), 全氟辛烷磺酸(PFOS), 全氟辛酸(PFOA), 多氯聯苯(PCBs), 多氯化萘(PCNs), 多氯三聯苯(PCTs), 聚氯乙烯(PVC), 短鏈氯化石蠟(SCCPs)進行測試。

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), Phthalates, Organotin compounds, Antimony(Sb), Beryllium(Be), Hexabromocyclododecane (HBCDD), Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA), Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs), Polyvinyl Chloride (PVC), Short Chain Chlorinated Paraffins (SCCPs) in the submitted sample(s).

檢測依據/檢測結果 請參見下頁。
Test Method/Test Result(s) Please refer to the following page(s).



馮智聰

馮智聰
實驗室經理 Laboratory Manager

日期 2023.04.25
Date

No. R392339491

桃園市蘆竹區南崁路二段9號5樓之6
5F-6, No.9, Sec.2, Nankan Rd, Luzhu Dist., Taoyuan, Taiwan

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檢測依據 Test Method

測試項目 Test Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
鉛 Lead (Pb)	參考IEC 62321-5:2013 Refer to IEC 62321-5:2013	ICP-OES
鎘 Cadmium (Cd)	參考IEC 62321-5:2013 Refer to IEC 62321-5:2013	ICP-OES
汞 Mercury (Hg)	參考IEC 62321-4:2013+AMD1:2017 CSV Refer to IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
六價鉻 Hexavalent Chromium (Cr(VI))	IEC 62321-7-1:2015	UV-Vis
多溴聯苯 Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS
多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS
氟 Fluorine (F)	參考EN 14582:2016 Refer to EN 14582:2016	IC
氯 Chlorine (Cl)	參考EN 14582:2016 Refer to EN 14582:2016	IC
溴 Bromine (Br)	參考EN 14582:2016 Refer to EN 14582:2016	IC
碘 Iodine (I)	參考EN 14582:2016 Refer to EN 14582:2016	IC
鄰苯二甲酸酯 Phthalates	IEC 62321-8:2017	GC-MS
有機錫 Organotin compounds	參考US EPA 3550C:2007 & ISO 17353:2004 Refer to US EPA 3550C:2007 & ISO 17353:2004	GC-MS

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測試項目 Test Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
短鏈氯化石蠟 Short Chain Chlorinated Paraffins (SCCPs)	參考US EPA 3550C:2007 & US EPA 8270E:2018 Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS(NCI)
多氯化萘 Polychlorinated Naphthalenes (PCNs)	參考US EPA 3550C:2007 & US EPA 8270E:2018 Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
銻 Antimony(Sb)	參考US EPA 3050B:1996 & US EPA 6010D:2018 Refer to US EPA 3050B:1996 & US EPA 6010D:2018	ICP-OES
全氟辛烷磺酸 Perfluorooctane Sulfonates(PFOS)	參考DIN CEN/TS 15968:2010 Refer to DIN CEN/TS 15968:2010	LC-MS-MS
聚氯乙烯 Polyvinyl Chloride (PVC)	參考JY/T 001-1996 Refer to JY/T 001-1996	FT-IR
多氯聯苯 Polychlorinated Biphenyls(PCBs)	參考US EPA 3550C:2007 & US EPA 8270E:2018 Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
多氯三聯苯 Polychlorinated terphenyls (PCTs)	參考US EPA 3550C:2007 & US EPA 8270E:2018 Refer to US EPA 3550C:2007 & US EPA 8270E:2018	GC-MS
全氟辛酸 Perfluorooctanoic Acid(PFOA)	參考DIN CEN/TS 15968:2010 Refer to DIN CEN/TS 15968:2010	LC-MS-MS
鈹 Beryllium(Be)	參考US EPA 3050B:1996 & US EPA 6010D:2018 Refer to US EPA 3050B:1996 & US EPA 6010D:2018	ICP-OES
六溴環十二烷 Hexabromocyclododecane (HBCDD)	IEC 62321-6:2015	GC-MS

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檢測結果 Test Result(s)

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
鉛 Lead (Pb)	N.D.	2 mg/kg
鎘 Cadmium (Cd)	N.D.	2 mg/kg
汞 Mercury (Hg)	N.D.	2 mg/kg
六價鉻 Hexavalent Chromium (Cr(VI))	N.D. ▼	0.10 µg/cm ² (LOQ)

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	

多溴聯苯 Polybrominated Biphenyls (PBBs)

一溴聯苯 Monobromobiphenyl	N.D.	5 mg/kg
二溴聯苯 Dibromobiphenyl	N.D.	5 mg/kg
三溴聯苯 Tribromobiphenyl	N.D.	5 mg/kg
四溴聯苯 Tetrabromobiphenyl	N.D.	5 mg/kg
五溴聯苯 Pentabromobiphenyl	N.D.	5 mg/kg
六溴聯苯 Hexabromobiphenyl	N.D.	5 mg/kg
七溴聯苯 Heptabromobiphenyl	N.D.	5 mg/kg
八溴聯苯 Octabromobiphenyl	N.D.	5 mg/kg
九溴聯苯 Nonabromobiphenyl	N.D.	5 mg/kg
十溴聯苯 Decabromobiphenyl	N.D.	5 mg/kg

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	

多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)

一溴二苯醚 Monobromodiphenyl ether	N.D.	5 mg/kg
二溴二苯醚 Dibromodiphenyl ether	N.D.	5 mg/kg
三溴二苯醚 Tribromodiphenyl ether	N.D.	5 mg/kg
四溴二苯醚 Tetrabromodiphenyl ether	N.D.	5 mg/kg
五溴二苯醚 Pentabromodiphenyl ether	N.D.	5 mg/kg
六溴二苯醚 Hexabromodiphenyl ether	N.D.	5 mg/kg
七溴二苯醚 Heptabromodiphenyl ether	N.D.	5 mg/kg
八溴二苯醚 Octabromodiphenyl ether	N.D.	5 mg/kg
九溴二苯醚 Nonabromodiphenyl ether	N.D.	5 mg/kg
十溴二苯醚 Decabromodiphenyl ether	N.D.	5 mg/kg

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測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP)		
鄰苯二甲酸丁基苄基酯 Butyl benzyl phthalate (BBP) CAS#:85-68-7	N.D.	50 mg/kg
鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP) CAS#:84-74-2	N.D.	50 mg/kg
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	N.D.	50 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
氟 Fluorine (F)	N.D.	50 mg/kg
氯 Chlorine (Cl)	N.D.	50 mg/kg
溴 Bromine (Br)	N.D.	50 mg/kg
碘 Iodine (I)	N.D.	50 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
鄰苯二甲酸酯 Phthalates		
鄰苯二甲酸二異癸酯 Di-iso-decyl phthalate (DIDP) CAS#:26761-40-0,68515-49-1	N.D.	50 mg/kg
鄰苯二甲酸二異壬酯 Di-isononyl phthalate (DINP) CAS#:28553-12-0,68515-48-0	N.D.	50 mg/kg
鄰苯二甲酸二正辛酯 Di-n-octyl phthalate (DNOP) CAS#:117-84-0	N.D.	50 mg/kg

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測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
有機錫 Organotin compounds		
二丁基錫 Dibutyltin (DBT)	N.D.	0.03 mg/kg
二辛基錫 Dioctyltin (DOT)	N.D.	0.03 mg/kg
三丁基錫 Tributyltin (TBT)	N.D.	0.03 mg/kg
三苯基錫 Triphenyltin (TPHT)	N.D.	0.03 mg/kg
三丁基氧化錫 Tributyltin oxide (TBTO)*	N.D.	0.03 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
短鏈氯化石蠟 Short Chain Chlorinated Paraffins (SCCPs)	N.D.	100 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
多氯化萘 Polychlorinated Naphthalenes (PCNs)	N.D.	5 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
多氯聯苯 Polychlorinated Biphenyls(PCBs)		
一氯聯苯 Monochlorobiphenyl	N.D.	0.5 mg/kg
二氯聯苯 Dichlorobiphenyl	N.D.	0.5 mg/kg
三氯聯苯 Trichlorobiphenyl	N.D.	0.5 mg/kg
四氯聯苯 Tetrachlorobiphenyl	N.D.	0.5 mg/kg
五氯聯苯 Pentachlorobiphenyl	N.D.	0.5 mg/kg
六氯聯苯 Hexachlorobiphenyl	N.D.	0.5 mg/kg
七氯聯苯 Heptachlorobiphenyl	N.D.	0.5 mg/kg
八氯聯苯 Octachlorobiphenyl	N.D.	0.5 mg/kg
九氯聯苯 Nonachlorobiphenyl	N.D.	0.5 mg/kg
十氯聯苯 Decachlorobiphenyl	N.D.	0.5 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
多氯三聯苯 Polychlorinated Triphenyls (PCTs)	N.D.	0.5 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
聚氯乙烯 Polyvinyl Chloride (PVC)	陰性 Negative	/

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檢測結果 Test Result(s)

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
六溴環十二烷 Hexabromocyclododecane (HBCDD)	N.D.	5 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
鈹 Beryllium (Be)	N.D.	2 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
全氟辛酸 Perfluorooctanoic Acid (PFOA)	N.D.	0.01 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
全氟辛烷磺酸 Perfluorooctane Sulfonates (PFOS)	N.D.	0.01 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	001	
銻 Antimony (Sb)	N.D.	2 mg/kg

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樣品/部位描述 Sample/Part Description

序號 No.	CTI樣品ID CTI Sample ID	描述 Description
1	001	樣品描述請參見照片 See the sample photo for your information

備註: 對於檢測鉛, 鎘, 汞之樣品已消解完全。
-N.D. = 未檢出 (小於方法檢出限或定量限)
-mg/kg = ppm = 百萬分之一
-LOQ = 定量限, 六價鉻的定量限為0.10 µg/cm²
-▽六價鉻濃度小於0.10 µg/cm², 樣品未檢出六價鉻。
-陰性表示不含有聚氯乙烯(PVC)
-*=三丁基氧化錫的濃度值是由三丁基錫結果換算而來。

Remark: **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury.**
-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.
-Negative = Not contained Polyvinyl Chloride(PVC)
-*=Concentration value of Tributyltin oxide by the conversion from the test results of Tributyl Tins.

注釋: 本報告中的資料結果供科研、教學、企業內部品質控制、企業產品研發等目的用。
Note: **The testing data and result(s) in this report is(are) just for scientific research, education, internal quality control and product development etc.**

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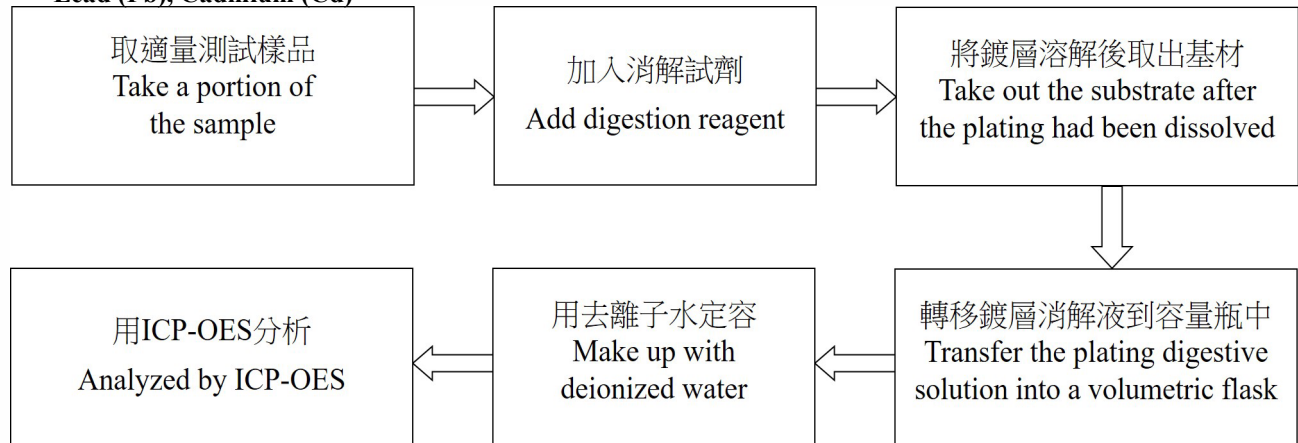
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檢測流程 Test Process

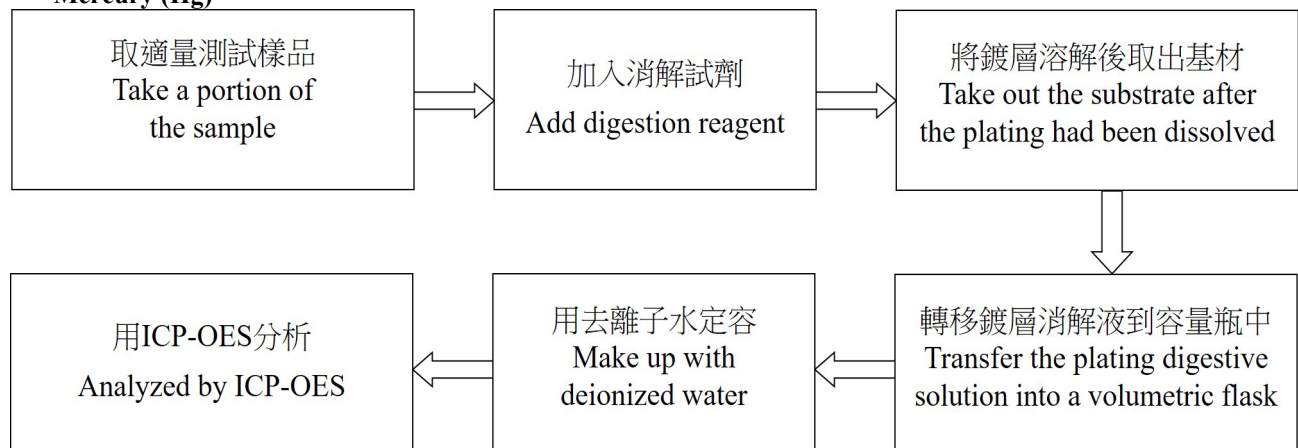
1. 鉛(Pb)， 鎘(Cd)

Lead (Pb), Cadmium (Cd)



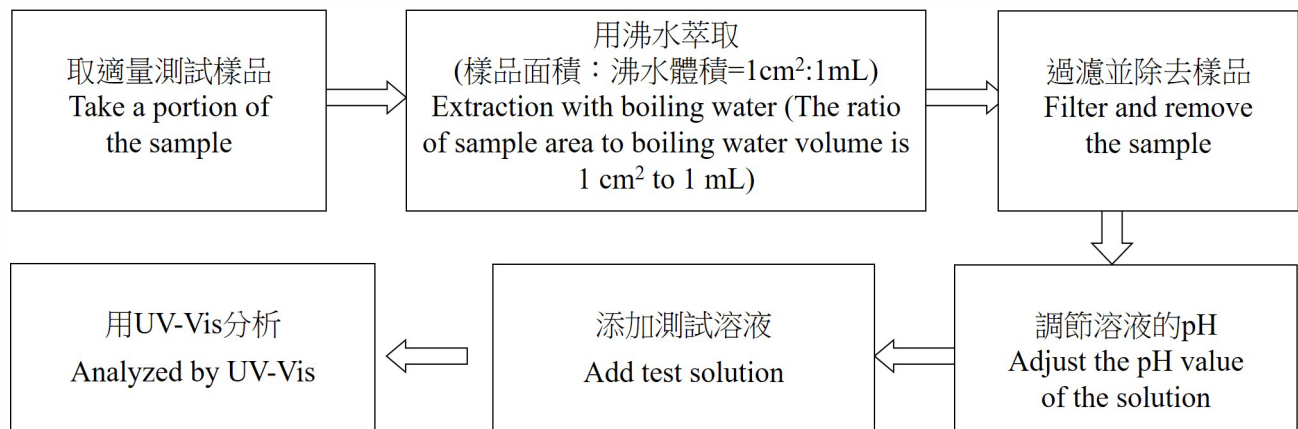
2. 汞(Hg)

Mercury (Hg)



3. 六價鉻(Cr(VI))

Hexavalent Chromium (Cr(VI))



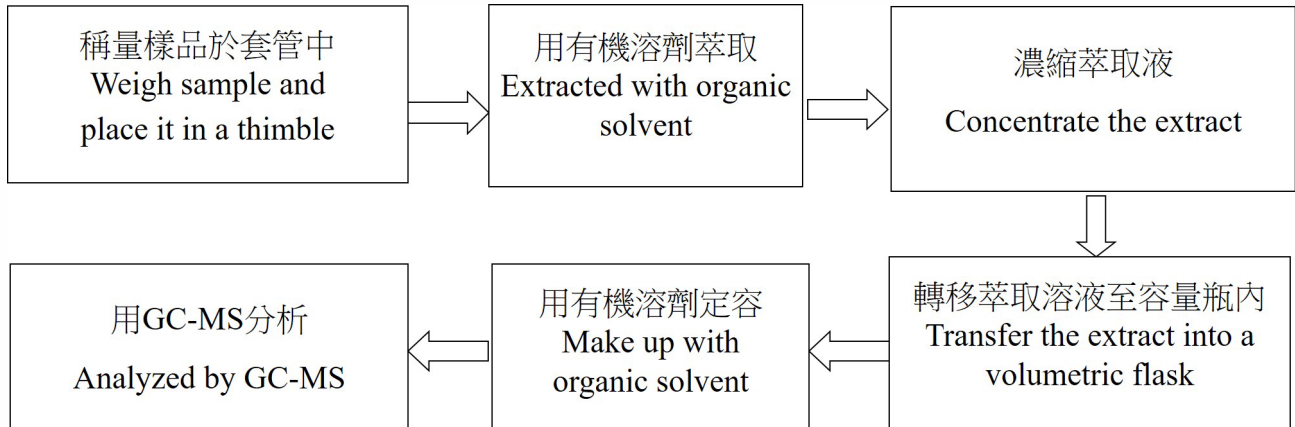
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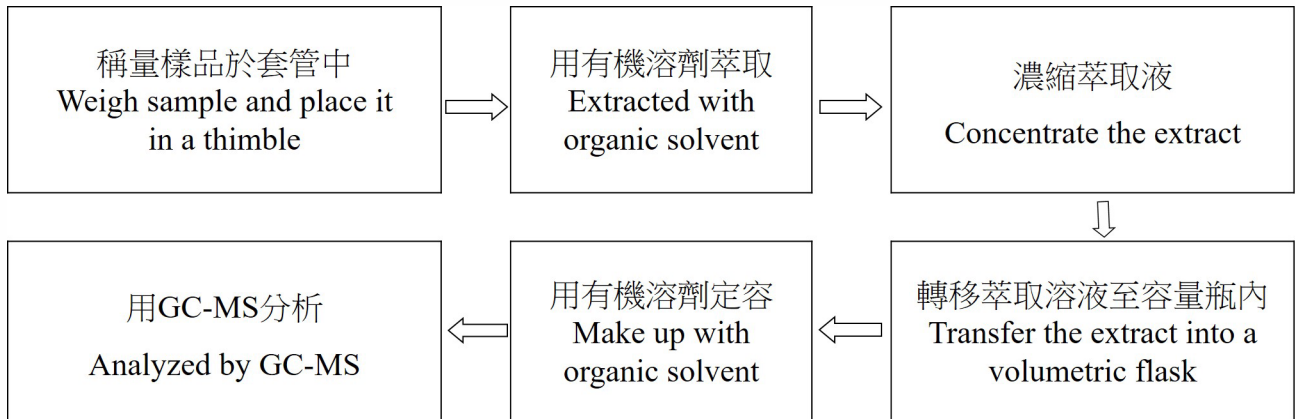
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4. 多溴聯苯(PBBs), 多溴二苯醚(PBDEs)

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

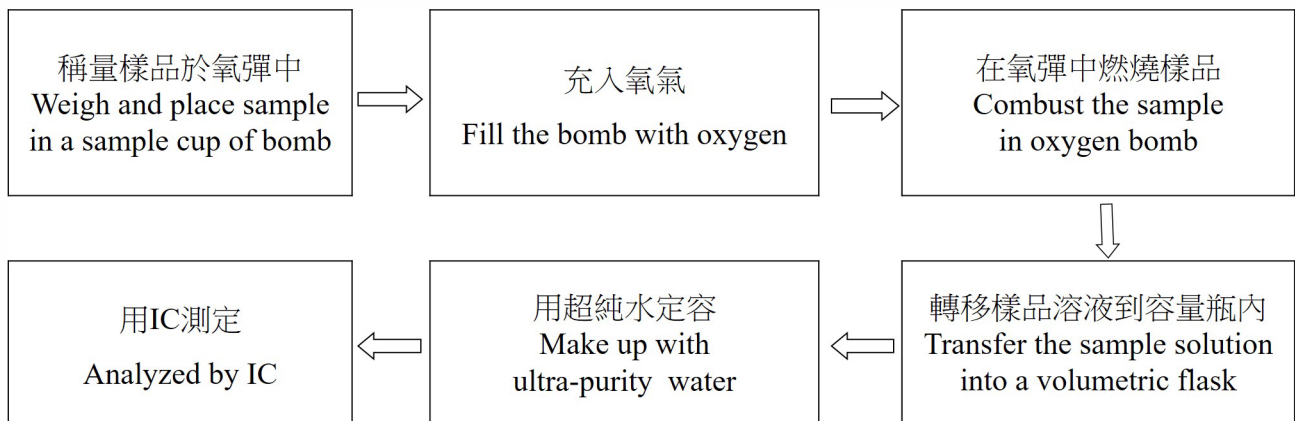


5. 鄰苯二甲酸酯(DBP, BBP, DEHP, DIBP), 鄰苯二甲酸酯 Phthalates (DBP, BBP, DEHP, DIBP), Phthalates



6. 氟(F), 氯(Cl), 溴(Br), 碘(I)

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



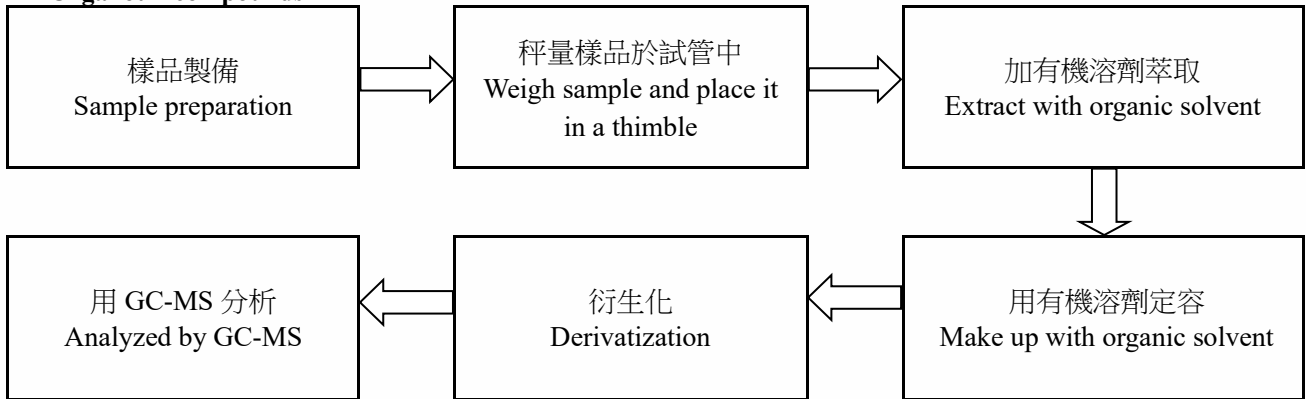
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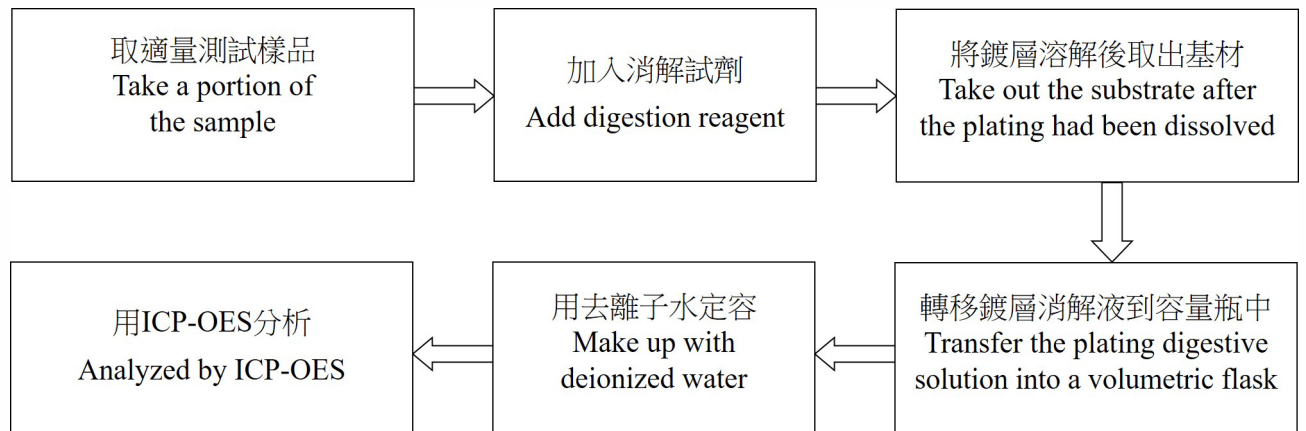
7. 有機錫

Organotin compounds



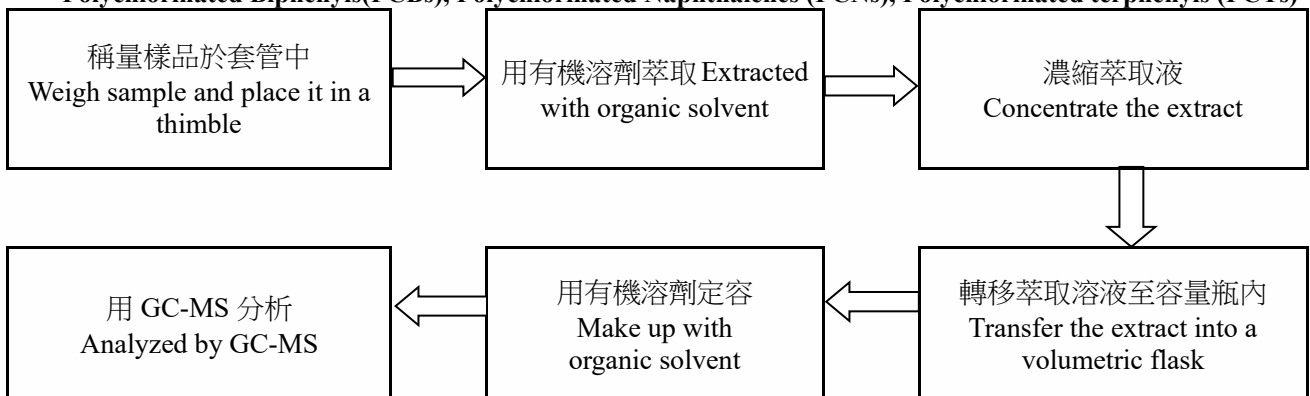
8. 銻(Sb), 鈹(Be)

Antimony(Sb), Beryllium(Be)



9. 多氯聯苯(PCBs), 多氯化萘(PCNs), 多氯三聯苯(PCTs)

Polychlorinated Biphenyls(PCBs), Polychlorinated Naphthalenes (PCNs), Polychlorinated terphenyls (PCTs)



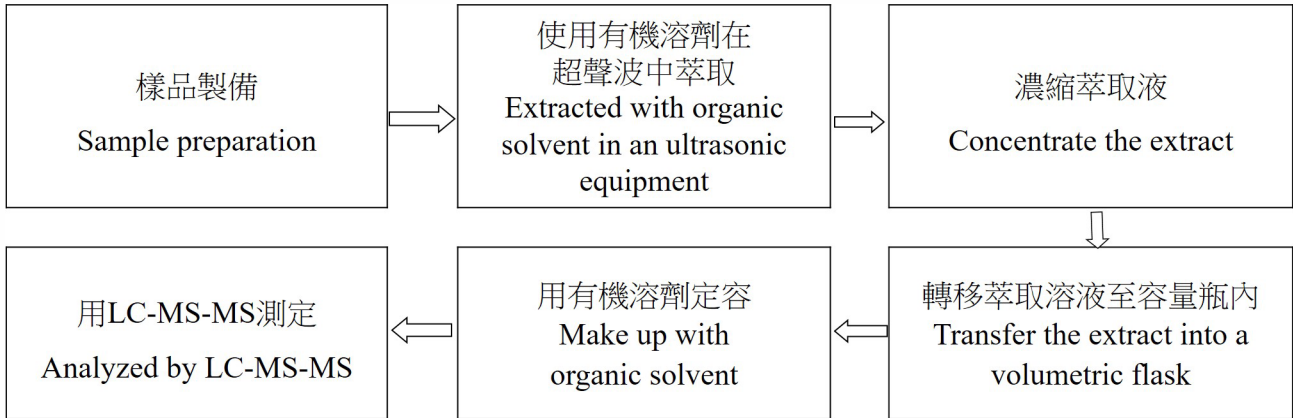
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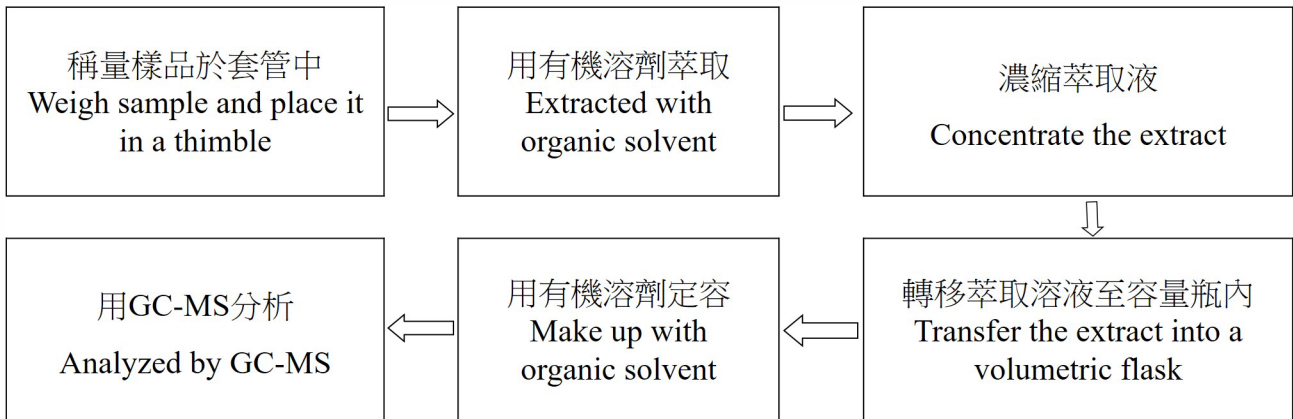
10. 全氟辛烷磺酸(PFOS), 全氟辛酸(PFOA)

Perfluorooctane Sulfonates(PFOS), Perfluorooctanoic Acid(PFOA)



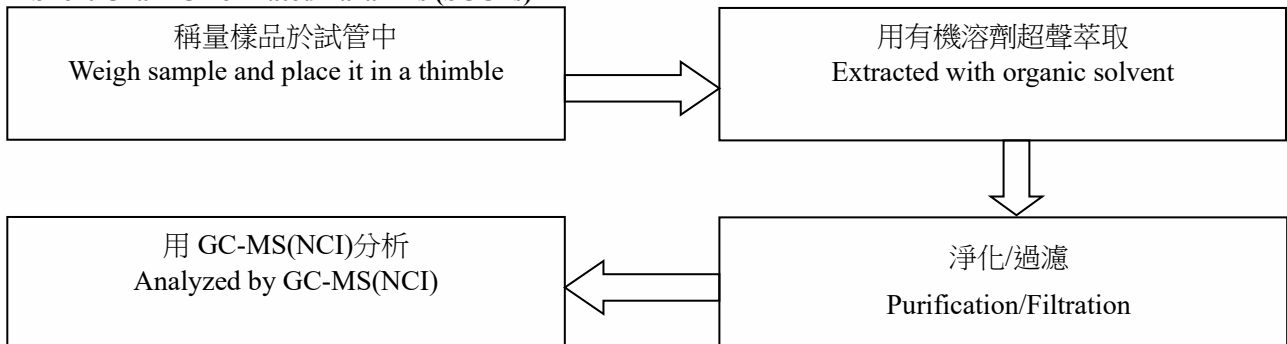
11. 六溴環十二烷(HBCDD)

Hexabromocyclododecane (HBCDD)



12. 短鏈氯化石蠟(SCCPs)

Short Chain Chlorinated Paraffins (SCCPs)



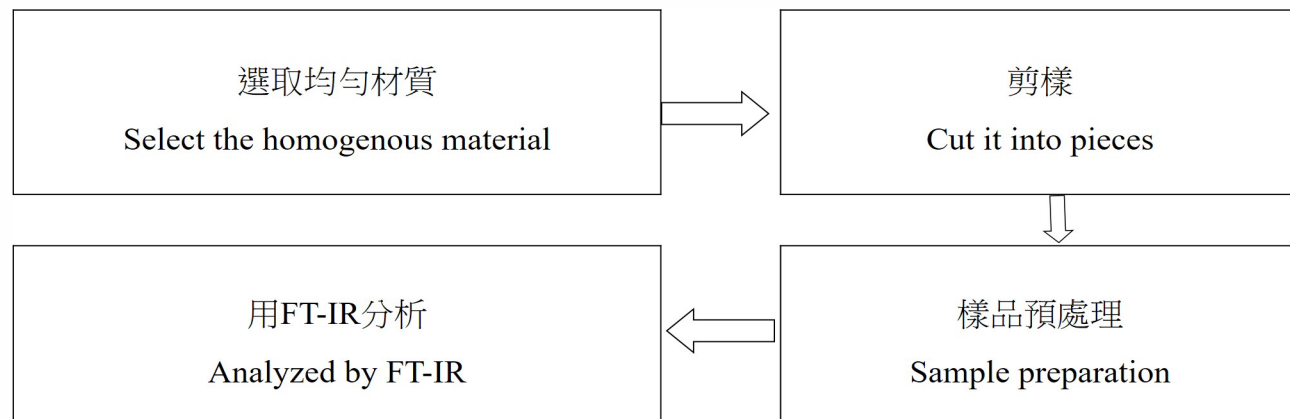
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13. 聚氯乙烯(PVC)

Polyvinyl Chloride (PVC)

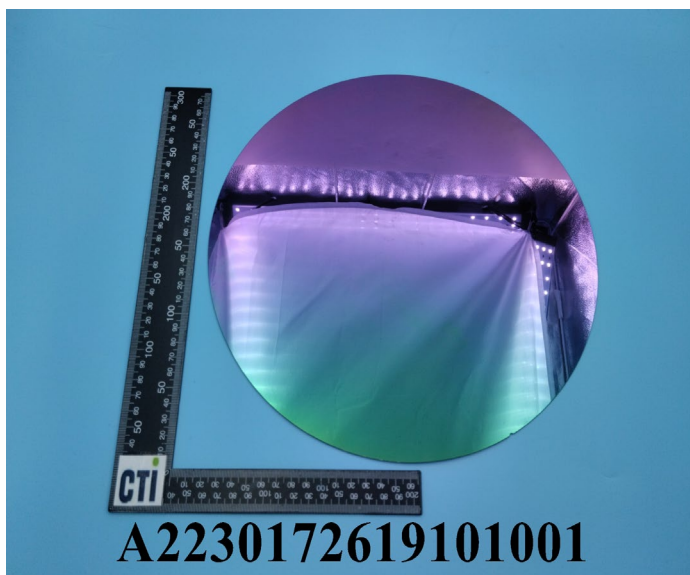
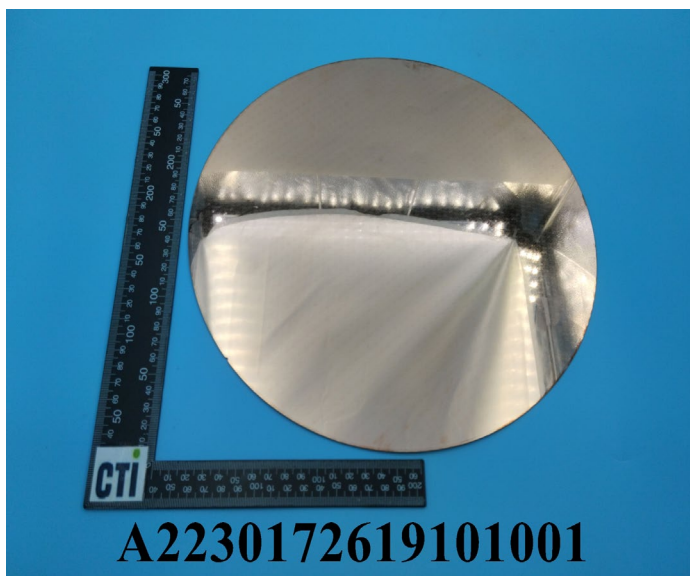


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樣品圖片 Photo(s) of the sample(s)



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聲明Statement：

1. 檢測報告無批准人簽字、“專用章”及報告騎縫章無效；
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