



檢測報告 Test Report

報告編號 A2250488801101002E
Report No. A2250488801101002E

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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 銅柱錫銀球
Sample Name Cu pillar SnAg BUMP, Cu layer+Ni layer+SnAg layer
樣品接收日期 2025.07.10
Sample Received Date Jul. 10, 2025
樣品檢測日期 2025.07.10-2025.07.16
Testing Period Jul. 10, 2025 to Jul. 16, 2025

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)，鄰苯二甲酸酯，氟(F)，氯(Cl)，溴(Br) 碘(I)，銻(Sb)，鉍(Be)，多氯化萘(PCNs)，多氯三聯苯(PCTs)，多氯聯苯(PCBs)，有機錫，六溴環十二烷(HBCDD)，聚氯乙稀(PVC)，短鏈氯化石蠟(SCCPs)，全氟辛酸(PFOA)及其鹽，全氟辛烷磺酸(PFOS)及其鹽和相關物質進行測試。

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), Phthalates ,Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I), Antimony(Sb), Beryllium(Be), Polychlorinated Naphthalenes (PCNs), Polychlorinated Terphenyls (PCTs), Polychlorinated Biphenyls(PCBs), Organotin compounds, Hexabromocyclododecane (HBCDD), Polyvinyl Chloride (PVC), Short Chain Chlorinated Paraffins (SCCPs), Perfluorooctanoic acid (PFOA) and its salts, Perfluorooctanesulfonic acid (PFOS) and its salts & related substances 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
Date

2025.07.17

No. R175255952

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 Tested Item(s)	測試方法 Test Method	測試儀器 Measured Equipment(s)
鉛 Lead (Pb)	IEC 62321-5:2013	ICP-OES
鎘 Cadmium (Cd)	IEC 62321-5:2013	ICP-OES
汞 Mercury (Hg)	IEC 62321-4:2013+AMD1:2017 CSV	ICP-OES
六價鉻 Hexavalent Chromium (Cr(VI))	IEC 62321-7-2:2017	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
鄰苯二甲酸酯 Phthalates	IEC 62321-8:2017	GC-MS
氟 Fluorine (F)	EN 14582:2016	IC
氯 Chlorine (Cl)	EN 14582:2016	IC
溴 Bromine (Br)	EN 14582:2016	IC
碘 Iodine (I)	EN 14582:2016	IC
銻 Antimony(Sb)	參考 US EPA 3052:1996 & US EPA 6010D:2018 Refer to US EPA 3052:1996 & US EPA 6010D:2018	ICP-OES
鈹 Beryllium(Be)	參考 US EPA 3052:1996 & US EPA 6010D:2018 Refer to US EPA 3052:1996 & US EPA 6010D:2018	ICP-OES
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
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
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
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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六溴環十二烷 Hexabromocyclododecane (HBCDD)	IEC 62321-6:2015	GC-MS
聚氯乙烯 Polyvinyl Chloride (PVC)	參考 JY/T 001-1996 Refer to JY/T 001-1996	FT-IR
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)
全氟辛酸 Perfluorooctanoic acid (PFOA) and its salts	參考 DIN CEN/TS 15968:2010 Refer to DIN CEN/TS 15968:2010	LC-MS-MS
全氟辛烷磺酸 Perfluorooctanesulfonic acid (PFOS) and its salts & related substances	參考 DIN CEN/TS 15968:2010 Refer to DIN CEN/TS 15968:2010	LC-MS-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
	002	
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.	2 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	002	
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
	002	
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
	002	
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
鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP) CAS#:84-69-5	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(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP) CAS#:117-81-7	N.D.	50 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	002	
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
	002	
銻 Antimony (Sb)	N.D.	2 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	002	
鈹 Beryllium (Be)	N.D.	2 mg/kg
測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	002	
六溴環十二烷 Hexabromocyclododecane (HBCDD)	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
	002	
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
鄰苯二甲酸二正辛酯 Di-n-octyl phthalate (DNOP) CAS#:117-84-0	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

測試項目 Tested Item(s)	結果 Result	方法檢出限 MDL
	002	
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
	002	
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
	002	
多氯聯苯(PCBs)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

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測試項目 Tested Item(s)	結果 Result		方法檢出限 MDL
	002		
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
三丁基氧化錫 Tributyltin oxide (TBTO)* ¹	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

測試項目 Tested Item(s)	結果 Result		方法檢出限 MDL
	002		
聚氯乙烯 Polyvinyl Chloride (PVC)	negative		/

測試項目 Tested Item(s)	結果 Result		方法檢出限 MDL
	002		
短鏈氯化石蠟 Short Chain Chlorinated Paraffins (SCCPs)	N.D.		100 mg/kg

測試項目 Tested Item(s)	CAS No.	結果 Result	方法檢出限 MDL
		002	
全氟辛酸(PFOA)及其鹽 Perfluorooctanoic acid (PFOA) and its salts			
全氟辛酸 Perfluorooctanoic acid (PFOA)	335-67-1	N.D.	0.01 mg/kg
全氟辛酸銨 Ammonium pentadecafluorooctanoate (APFO)*	3825-26-1	N.D.	0.01 mg/kg
全氟辛酸鈉 Sodium perfluorooctanoate (PFOA-Na)*	335-95-5	N.D.	0.01 mg/kg
全氟辛酸鉀 Potassium perfluorooctanoate (PFOA-K)*	2395-00-8	N.D.	0.01 mg/kg
全氟辛酸銀 Silver perfluorooctanoate (PFOA-Ag)*	335-93-3	N.D.	0.01 mg/kg
全氟辛氟 Perfluorooctanoyl fluoride (PFOA-F)*	335-66-0	N.D.	0.01 mg/kg

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測試項目 Tested Item(s)	CAS No.	結果 Result	方法檢出限 MDL
		002	
全氟辛烷磺酸(PFOS)及其鹽和相關物質 Perfluorooctanesulfonic acid (PFOS) and its salts & related substances			
全氟辛烷磺酸 Perfluorooctane Sulfonates (PFOS)	1763-23-1	N.D.	0.01 mg/kg
全氟辛基磺酸鉀 Perfluorooctanesulfonic acid, potassium salt (PFOS-K)*	2795-39-3	N.D.	0.01 mg/kg
全氟辛基磺酸鋰 Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)*	29457-72-5	N.D.	0.01 mg/kg
全氟辛基磺酸鈉 Sodium perfluorooctane sulfonate (PFOS-Na)*	4021-47-0	N.D.	0.01 mg/kg
全氟辛基磺酸鎂 1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluoro-, magnesium salt (2:1) (PFOS-Mg)*	91036-71-4	N.D.	0.01 mg/kg
全氟辛基磺酸銨 Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)*	29081-56-9	N.D.	0.01 mg/kg
全氟辛基磺酸二乙醇銨 Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)*	70225-14-8	N.D.	0.01 mg/kg
全氟辛基磺酸四乙基銨 Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C ₂ H ₅) ₄)*	56773-42-3	N.D.	0.01 mg/kg
全氟辛基磺酸二癸二甲基銨 Didecyl dimethyl ammonium perfluorooctane sulfonate (PFOS-DDA)*	251099-16-8	N.D.	0.01 mg/kg
全氟辛基磺酰氟 Perfluoro-1-octanesulfonyl fluoride (PFOSF)*	307-35-7	N.D.	0.01 mg/kg
全氟辛基磺酸哌啶 Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluorooctanesulfonate*	71463-74-6	N.D.	0.01 mg/kg
氟蟲胺 N-Ethylperfluoro-1-octanesulfonamide (N-Et-FOSA)	4151-50-2	N.D.	0.05 mg/kg
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-N-甲基-辛基磺酰胺 N-Methylperfluoro-1-octanesulfonamide (N-Me-FOSA)	31506-32-8	N.D.	0.05 mg/kg
N-乙基全氟辛基磺酰胺乙醇 2-(N-Ethylperfluoro-1-octanesulfonamido)-ethanol (N-Et-FOSE)	1691-99-2	N.D.	0.05 mg/kg
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-十七氟-N-(2-羥乙基)-N-甲基-1-辛基磺酰胺 2-(N-Methylperfluoro-1-octanesulfonamido)-ethanol (N-Me-FOSE)	24448-09-7	N.D.	0.05 mg/kg
全氟辛基磺酰胺 Perfluorooctanesulfonamide (PFOSA)	754-91-6	N.D.	0.01 mg/kg

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樣品/部位描述 Sample/Part Description

序號	CTI 樣品 ID	描述
No.	CTI Sample ID	Description
1	002	晶圓 Wafer

備註: 對於檢測鉛, 鎘, 汞, 銻, 鉍之樣品已消解完全。

-N.D. = 未檢出 (小於方法檢出限)

-mg/kg = ppm = 百萬分之一

-陰性表示不含有聚氯乙烯(PVC)

-^{*1}=三丁基氧化錫的濃度值是由三丁基錫結果換算而來。

-*=該物質的結果由其特定化合物的結果換算而來。

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

-MDL = Method Detection Limit

-N.D. = Not Detected (<MDL)

-mg/kg = ppm = parts per million

-Negative = Not contained Polyvinyl Chloride(PVC)

-^{*1}=Concentration value of Tributyltin oxide by the conversion from the test results of Tributyl Tins.

-*=Result(s) shown of the substance(s) is/ are converted from the result(s) of certain compound(s).

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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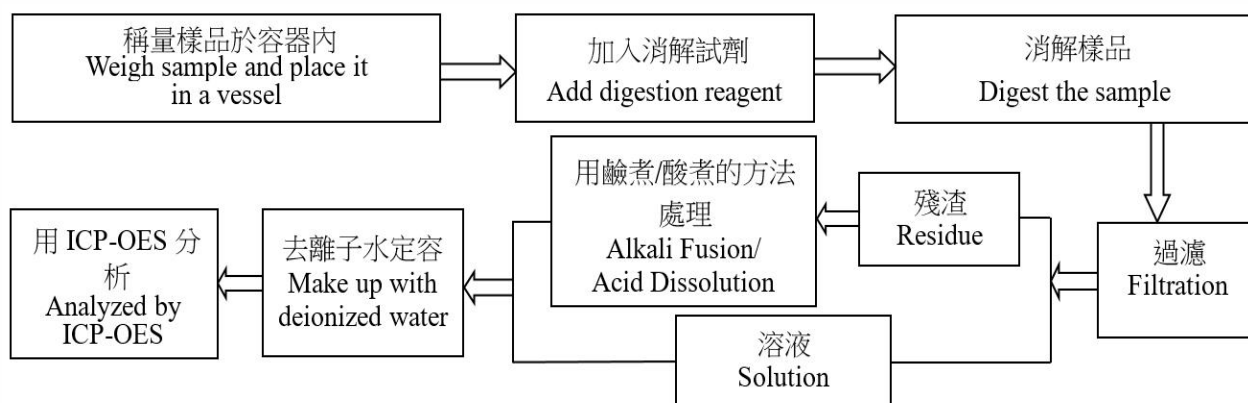
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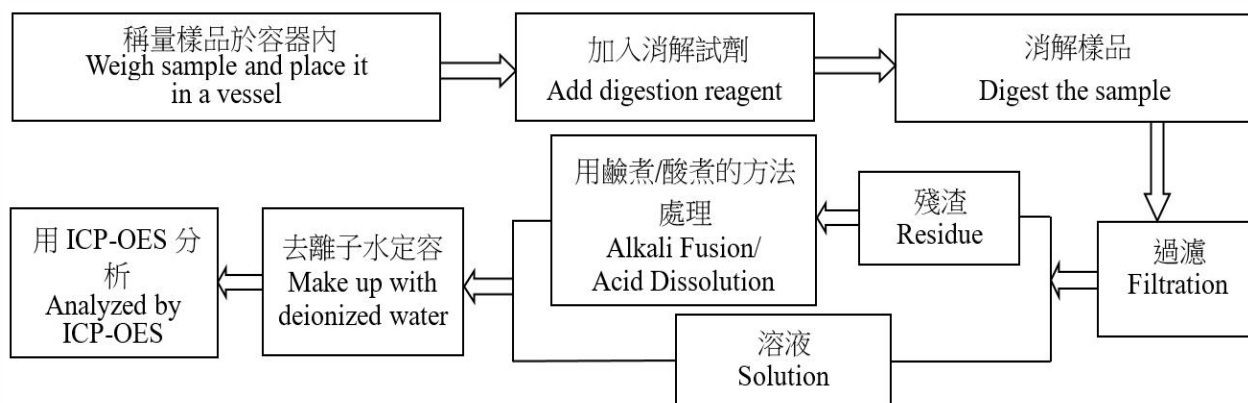
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檢測流程 Test Process

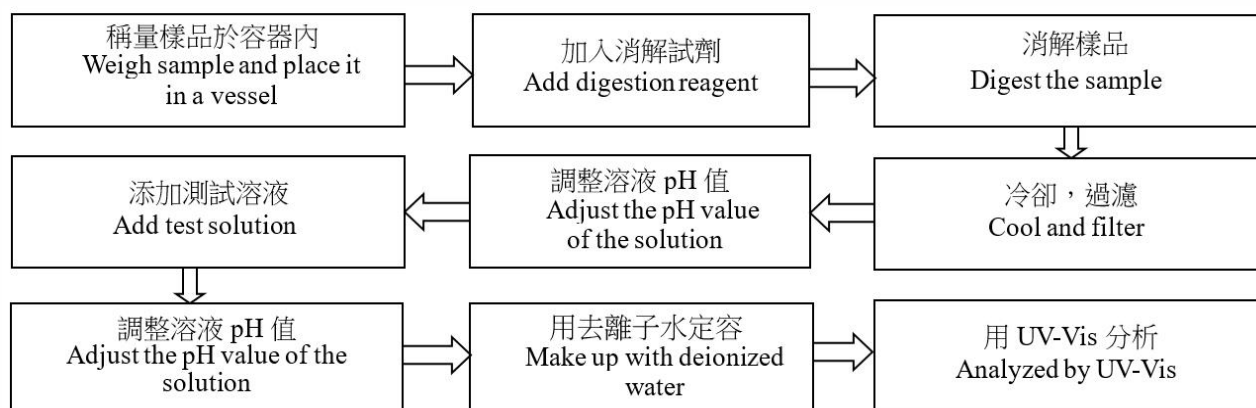
1. 鉛 Lead (Pb), 鎘 Cadmium (Cd)



2. 汞 Mercury (Hg)



3. 六價鉻 Hexavalent Chromium (Cr(VI))

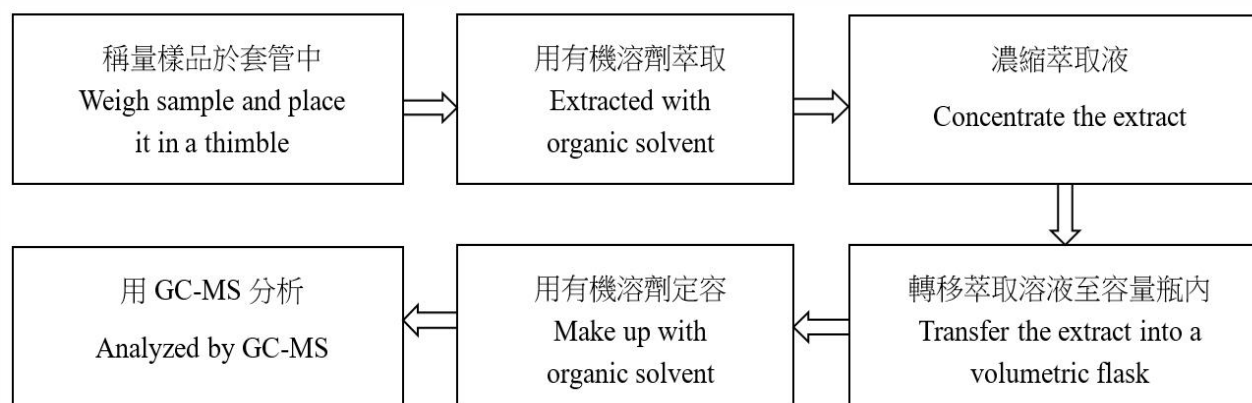


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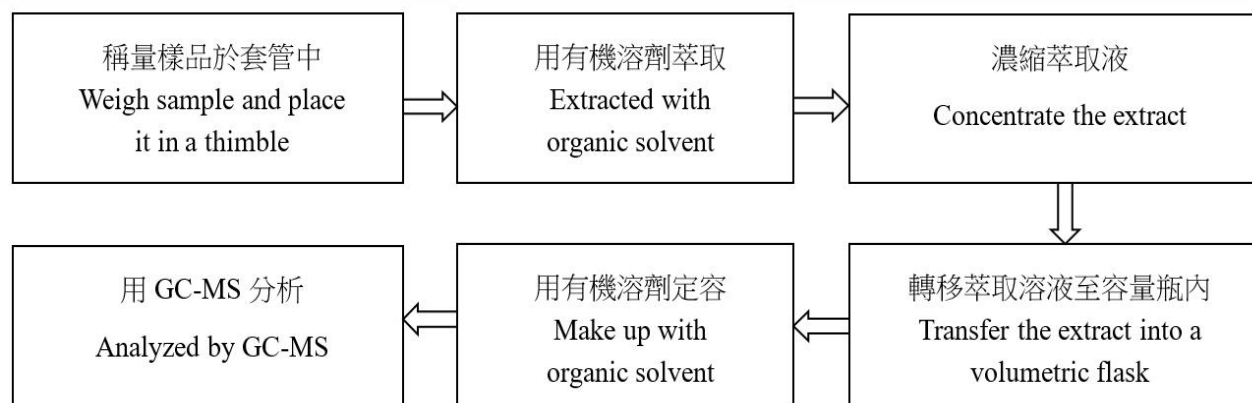
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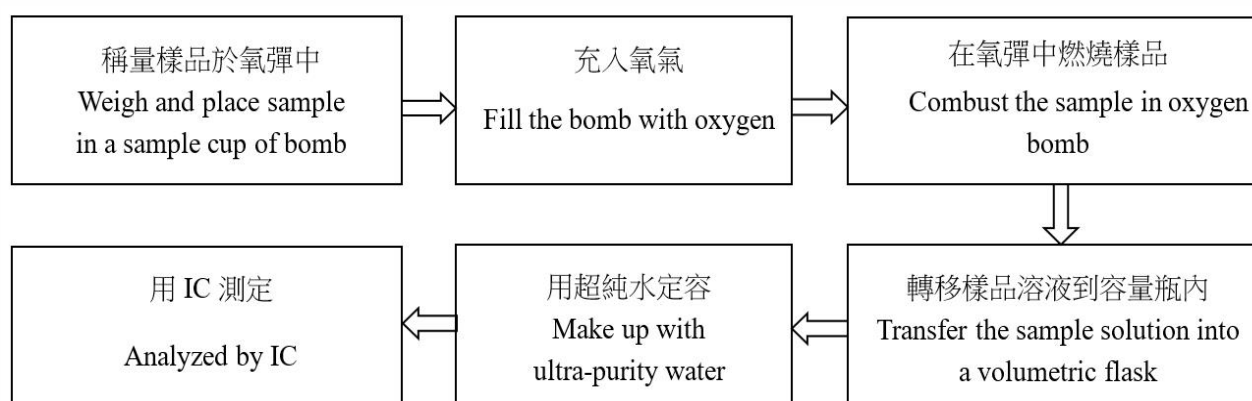
4. 多溴聯苯 Polybrominated Biphenyls (PBBs), 多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs)



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 Fluorine (F), 氯 Chlorine (Cl), 溴 Bromine (Br), 碘 Iodine (I)

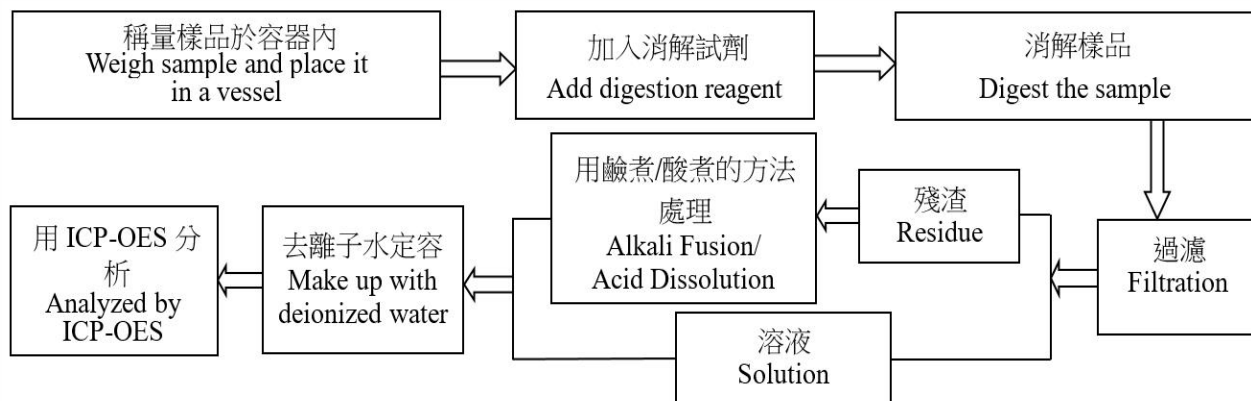


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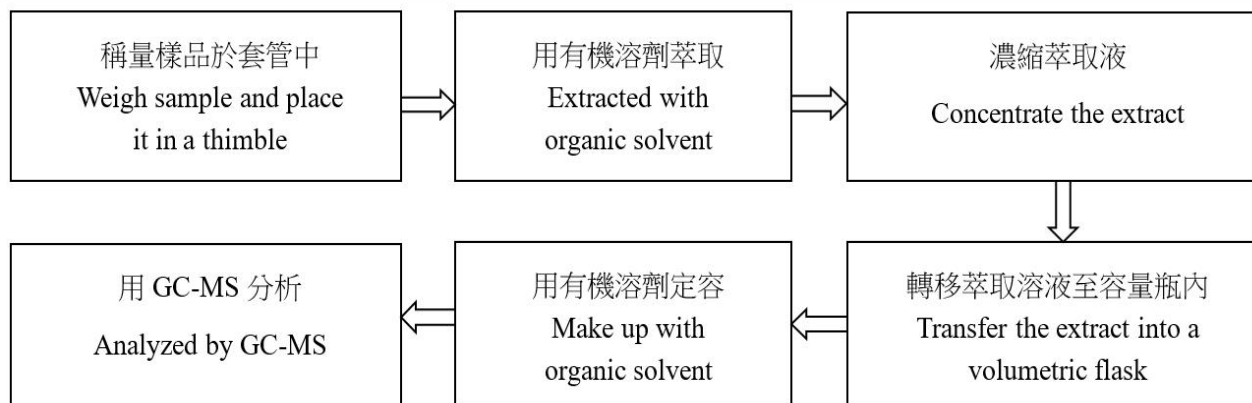
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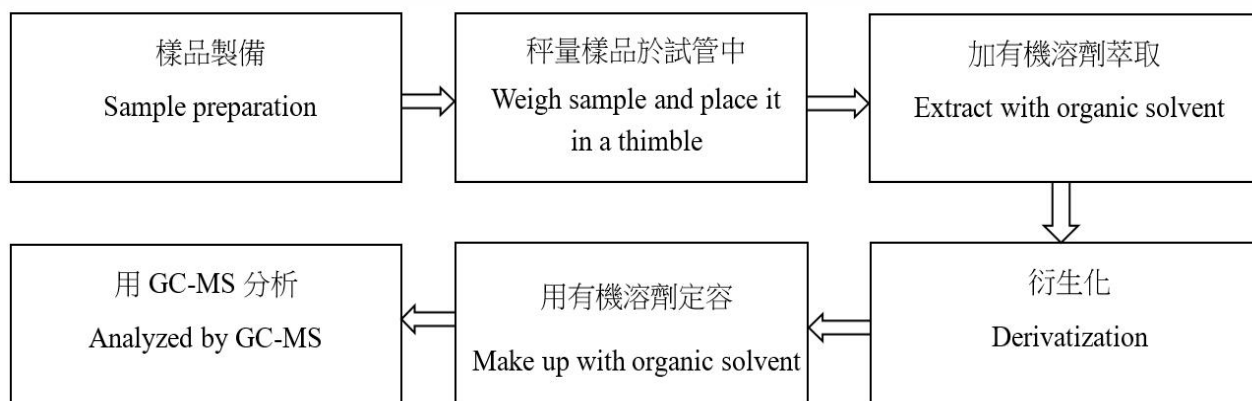
7. 銻 Antimony(Sb), 鈹 Beryllium(Be)



8. 多氯化萘 Polychlorinated Naphthalenes (PCNs), 多氯三聯苯 Polychlorinated Terphenyls (PCTs), 多氯聯苯 Polychlorinated Biphenyls(PCBs)



9. 有機錫 Organotin compounds

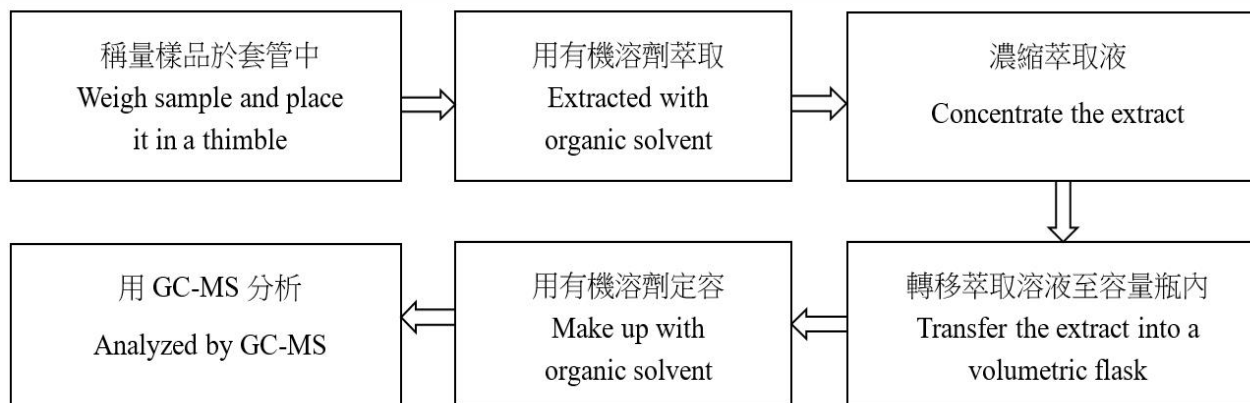


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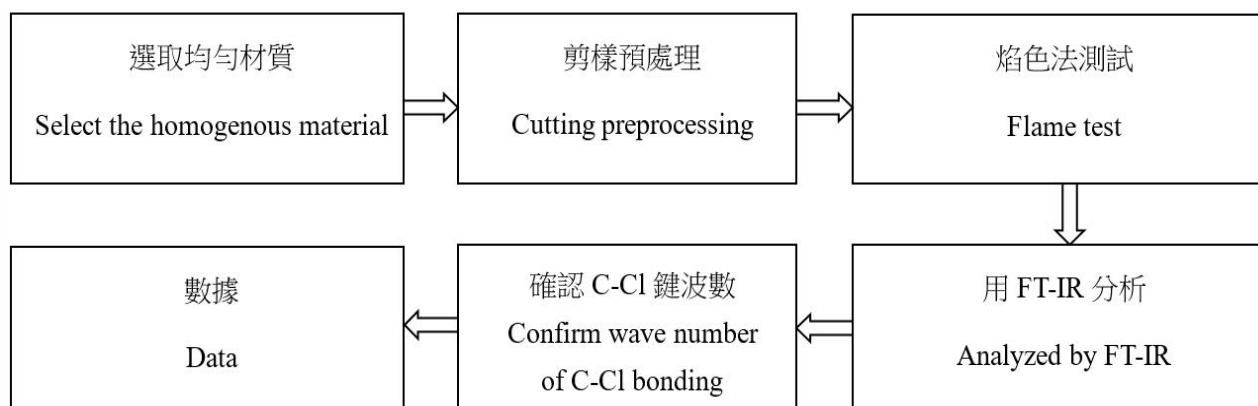
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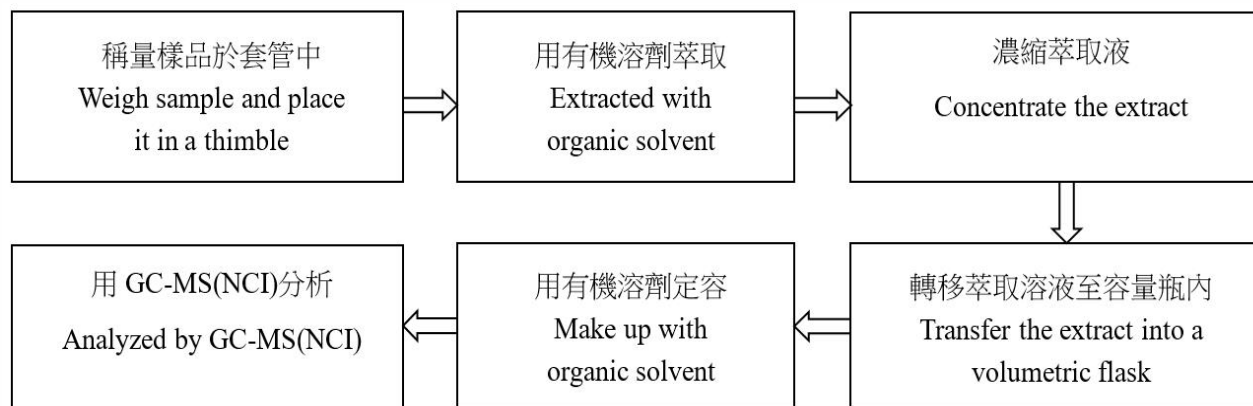
10. 六溴環十二烷 Hexabromocyclododecane (HBCDD)



11. 聚氯乙烯 Polyvinyl Chloride (PVC)



12. 短鏈氯化石蠟 Short Chain Chlorinated Paraffins (SCCPs)



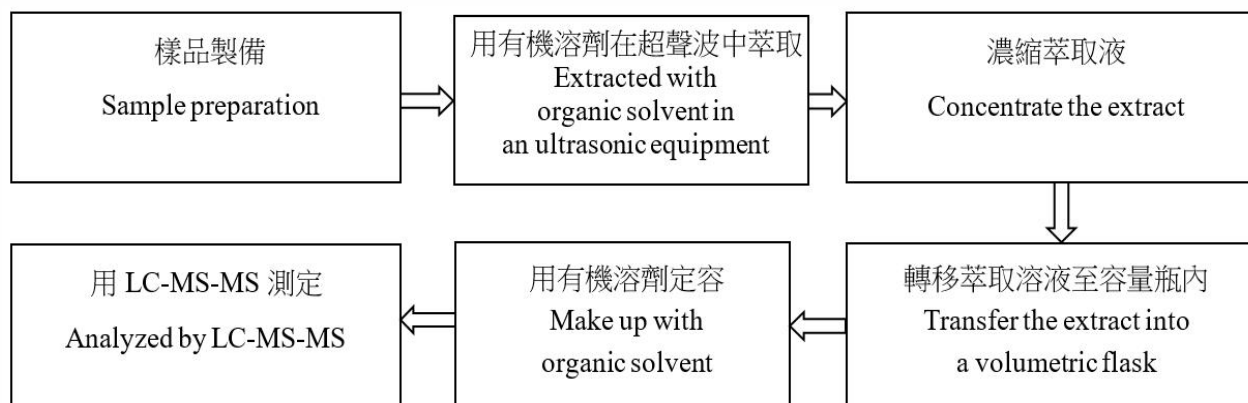
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13. 全氟辛酸(PFOA)及其鹽 Perfluorooctanoic acid (PFOA) and its salts, 全氟辛烷磺酸(PFOS)及其鹽和
相關物質 Perfluorooctanesulfonic acid (PFOS) and its salts & related substances



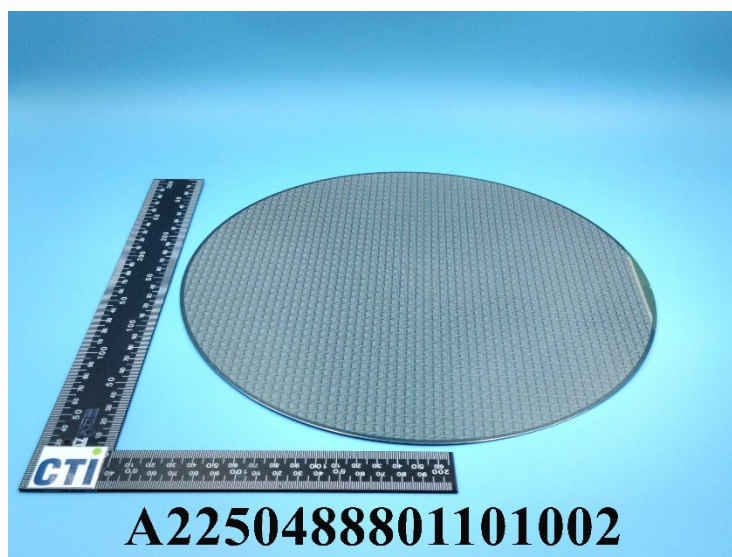
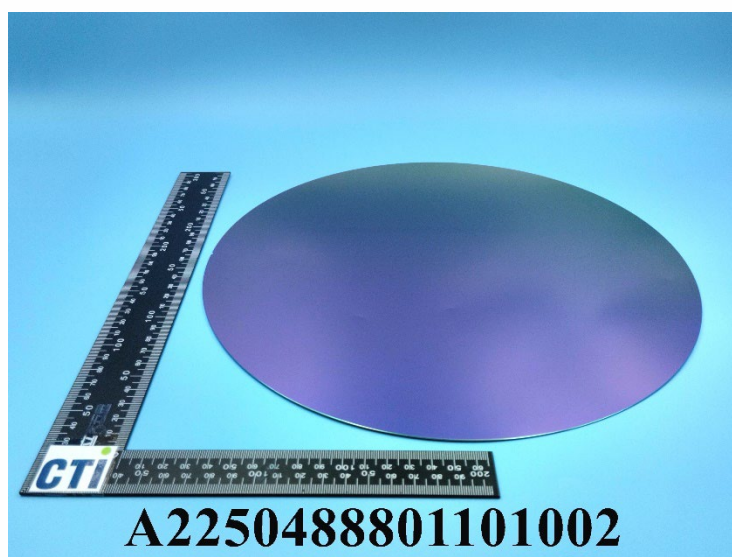
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樣品圖片

Photo(s) of the sample(s)



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