

Test Report

號碼(No.): CE/2018/A5866 日期(Date): 2018/11/06 頁數(Page): 1 of 13

希華晶體科技股份有限公司 SIWARD CRYSTAL TECHNOLOGY CO., LTD.

台中市潭子區中山路三段111巷1之1號

NO. 1-1, LN. 111, SEC. 3, ZHONGSHAN RD., TANZI DIST., TAICHUNG CITY 427, TAIWAN (R. O. C.)

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as):

送樣廠商(Sample Submitted By) 希華晶體科技股份有限公司 (SIWARD CRYSTAL TECHNOLOGY CO., LTD.)

樣品名稱(Sample Description) DIP 49U CRYSTAL 樣品型號(Style/Item No.) 49U, UM SERIES 收件日期(Sample Receiving Date) 2018/10/31

測試期間(Testing Period) 2018/10/31 TO 2018/11/06

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).





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測試結果(Test Results)

測試部位(PART NAME)No.1 整體混測 (MIXED ALL PARTS)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013),以感應耦合電 漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n. d.
鉛 / Lead (Pb)	mg/kg	参考IEC 62321-5 (2013),以感應耦合電 漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n. d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4 (2013),以感應耦合電 漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	n. d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	参考IEC 62321-7-2 (2017),以UV-VIS檢 測. / With reference to IEC 62321-7- 2 (2017) and performed by UV-VIS.	8	n. d.
多溴聯苯總和 / Sum of PBBs	mg/kg		_	n. d.
一溴聯苯 / Monobromobiphenyl	mg/kg	参考IEC 62321-6 (2015),以氣相層析儀 /質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.	5	n. d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n. d.
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n. d.
四溴聯苯 / Tetrabromobiphenyl	mg/kg		5	n. d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n. d.
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n. d.
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n. d.
八溴聯苯 / Octabromobiphenyl	mg/kg		5	n. d.
九溴聯苯 / Nonabromobiphenyl	mg/kg		5	n. d.
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n. d.



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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		(MDL)	No. 1 n. d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n. d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg	1	5	n. d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg	1	5	n. d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg	參考IEC 62321-6 (2015),以氣相層析儀	5	n. d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	/質譜儀檢測. / With reference to IEC	5	n. d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg	62321-6 (2015) and performed by	5	n. d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg	GC/MS.	5	n. d.
八溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n. d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n. d.
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n. d.
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	参考IEC 62321-8 (2017),以氣相層析儀 /質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n. d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n. d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n. d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0; 68515-49-1)	mg/kg		50	n. d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0; 68515-48-0)	mg/kg		50	n. d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n. d.



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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result) No.1
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	参考IEC 62321 (2008),以氣相層析儀/質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n. d.
鹵素 / Halogen				
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	n. d.
鹵素 (氣) / Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	参考BS EN 14582 (2016),以離子層析儀分析. / With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n. d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n. d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n. d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C (2007),以液相層析 儀/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	10	n. d.
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	参考US EPA 3550C (2007),以液相層析 儀/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	10	n. d.
銻 / Antimony (Sb)	mg/kg	参考US EPA 3050B (1996),以感應耦合 電漿原子發射光譜儀檢測. / With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES.	2	n. d.
鈹 / Beryllium (Be)	mg/kg	参考US EPA 3050B (1996),以感應耦合 電漿原子發射光譜儀檢測. / With reference to US EPA 3050B (1996). Analysis was performed by ICP-AES.	2	n. d.



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備註(Note):

- 1. mg/kg = ppm; 0. 1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限值)
- 4. "-" = Not Regulated (無規格值)

PFOS参考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或 塗層材料中不得超過1μg/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above $1\mu g/m^2$.)

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重金屬流程圖 / Analytical flow chart of Heavy Metal

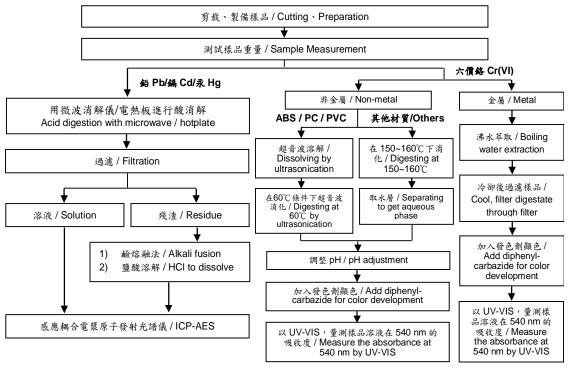
日期(Date): 2018/11/06

根據以下的流程圖之條件,樣品已完全溶解。(六價鉻測試方法除外)

 $These \ samples \ were \ dissolved \ totally \ by \ pre-conditioning \ method \ according \ to \ below \ flow \ chart. \ (\ Cr^{6+} \ test \ method \ excluded)$

測試人員: 陳恩臻 / Technician: Rita Chen

測試負責人:張啟興 / Supervisor: Troy Chang





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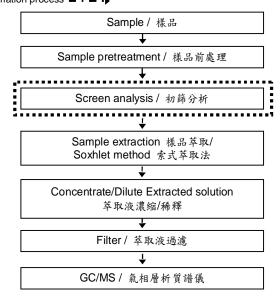
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

測試人員:涂雅苓 / Technician: Yaling Tu

測試負責人:張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process _ 確認程序 / Confirmation process - - - - →





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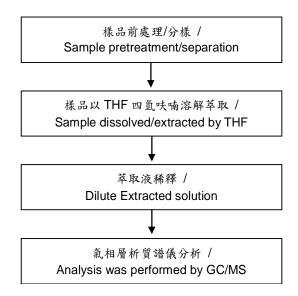
可塑劑分析流程圖 / Analytical flow chart - Phthalate

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測試人員:涂雅苓 / Technician: Yaling Tu 測試負責人:張啟興 / Supervisor: Troy Chang

【測試方法/Test method: IEC 62321-8】





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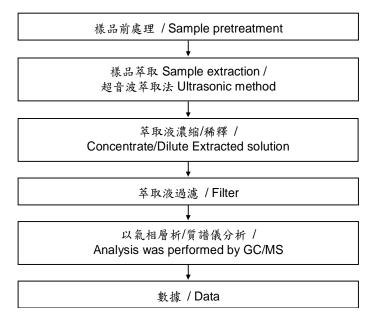
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

測試人員:涂雅苓 / Technician: Yaling Tu

測試負責人:張啟興 / Supervisor: Troy Chang





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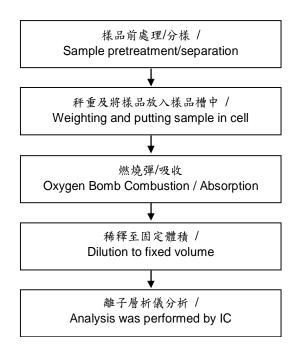
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鹵素分析流程圖 / Analytical flow chart - Halogen

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測試人員:陳恩臻 / Technician: Rita Chen 測試負責人:張啟興 / Supervisor: Troy Chang





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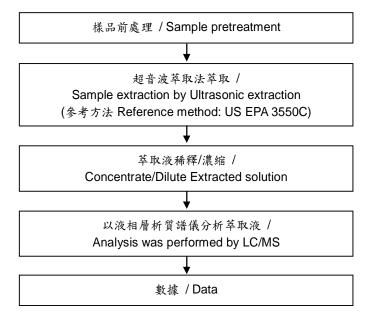
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全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

日期(Date): 2018/11/06

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang





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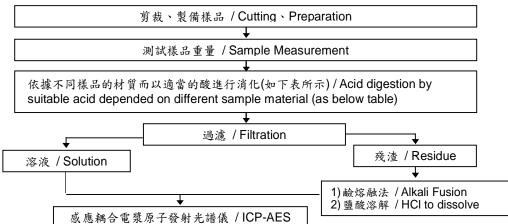
根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

測試人員: 陳恩臻 / Technician: Rita Chen 測試負責人:張啟興 / Supervisor: Troy Chang

元素以 ICP-AES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-AES)

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鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 /
	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
玻璃 / Glass	硝酸,氫氟酸 / HNO ₃ /HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO ₃
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate
	reagent to total digestion



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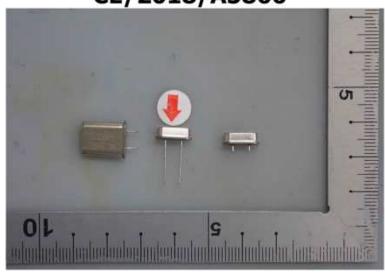
號碼(No.): CE/2018/A5866 日期(Date): 2018/11/06 頁數(Page): 13 of 13

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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

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** 報告結尾 (End of Report) **