SIL-LIFE 10000 ppm TEST REPORT



银生命(SIL-LIFE) 产品分析报告

10000 ppm

测试项目

- 01 TEM 粒径与EDX分析
- 02 DLS 二次纳米粒径分析
- 03 UV-Vis 吸收光谱分析
- 04 ICP-OES 银浓度分析
- 05 离子层析仪 卤素分析
- 06 RoHS 分析



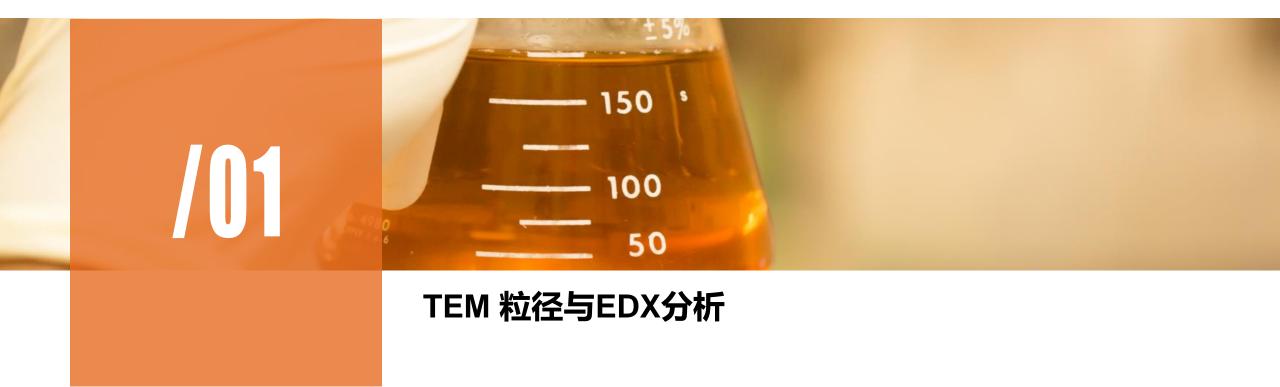
材料介绍-银生命 SIL-LIFE 水溶液



银生命™(SIL-LIFE)之技术历经长达15年研发而成,藉由特殊安定剂的控制,让纳米银可长时间稳定分散于纯水中。

SIL-LIFE纳米银可精准稳定的释放银离子,与细菌结合后将其消灭,达到长效的抗菌效果。

产地	台湾
基材	纳米银
形貌	棕色水溶液
溶剂	纯水
粒径大小	5~7nm
浓度	10,000 ppm
密度	1.01
pH值	8
包装	20KG

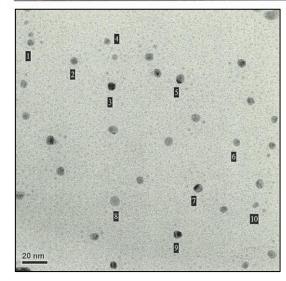


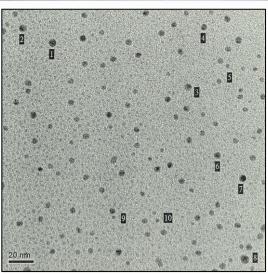
经过透射电镜(TEM)分析,银生命(SIL-LIFE)纳米银粒径平均为5nm。

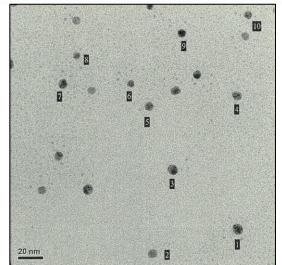
Measuring data

Sample No. 1709-011

Image	Particle									
No.	1	2	3	4	5	6	7	8	9	10
1	7.56	6.91	6.17	4.53	7.23	5.55	6.48	6.13	7.98	7.47
2	5.74	5.95	5.84	5.34	3.70	5.54	5.43	7.07	3.10	3.29
3	7.93	4.62	6.01	7.16	6.79	3.44	6.48	7.88	7.29	4.18
4	4.91	5.66	6.51	5.54	7.24	5.65	6.92	8.01	6.31	5.02
5	7.70	6.93	7.97	8.30	7.08	5.16	6.86	5.25	7.00	5.21
6	7.42	6.09	7.26	4.70	6.29	4.34	4.03	2.53	6.29	2.76





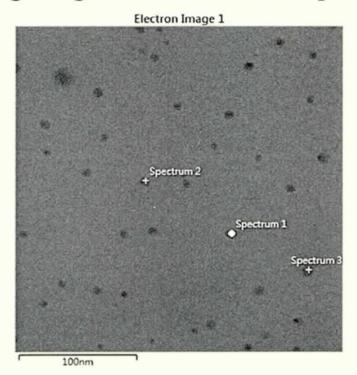


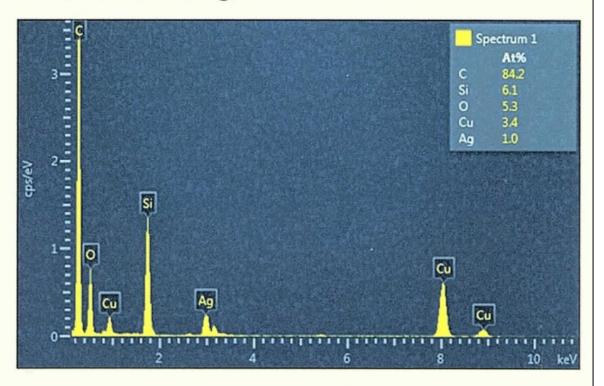
Unit: nm

使用透射电镜(TEM)上的能量色散X射线谱仪(EDS)进行定性半定量全成份分析,从数据中可以看到银生命(SIL-LIFE)颗粒为银。

因为进行TEM测试使用镀碳铜网,加上空气中会有些杂质溶入,所以分析出碳(C)、硅(Si)、氧(O)、铜(Cu)为正常现象。

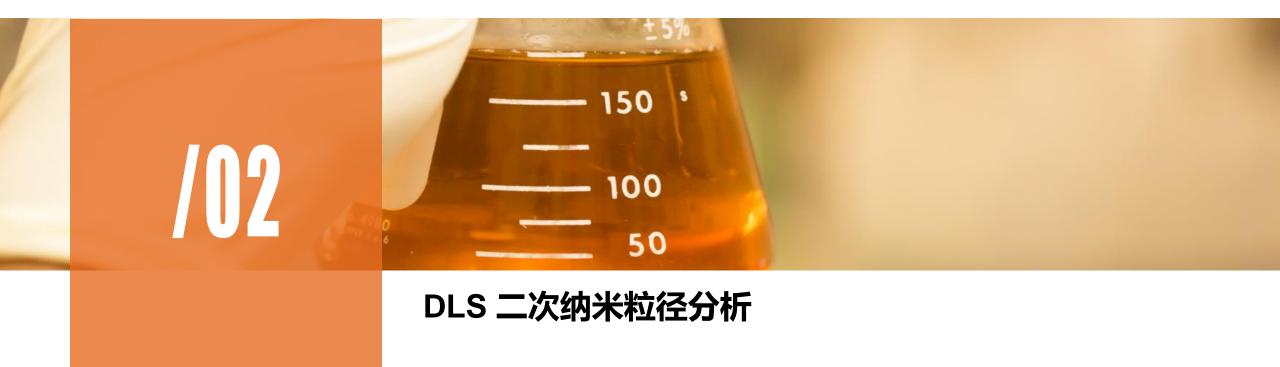
The following images show that the sample contains C, O, Si, Cu, Ag, and so on.



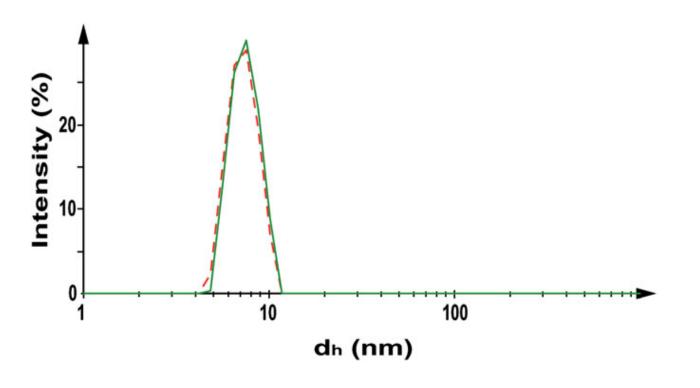


STEM image

EDS spectrum



二次纳米粒径约为 8.516 nm

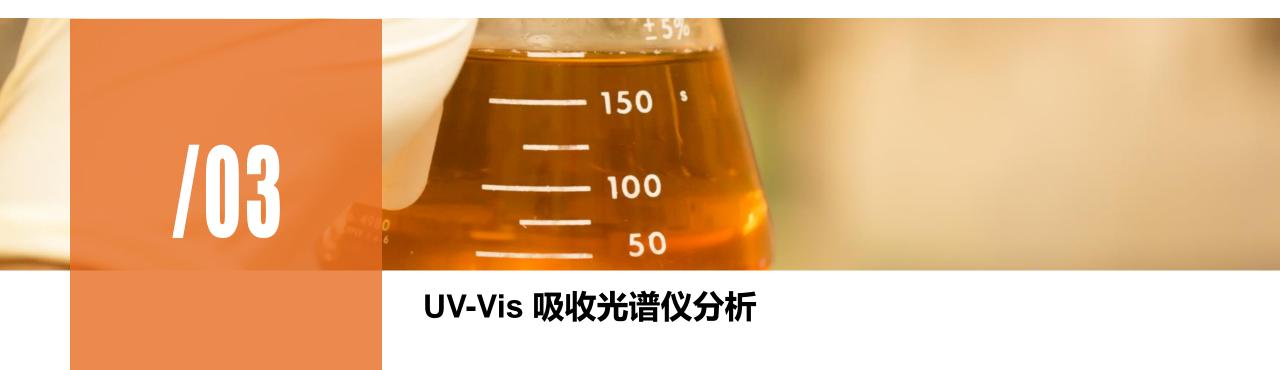


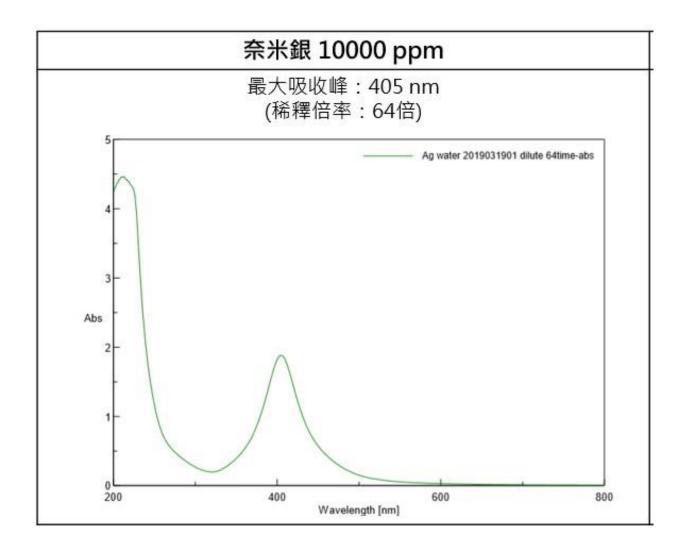


厂牌: Malvern

型号: Nano ZS

利用雷射光射入含有粒子的溶液中, 当雷射光撞击 到粒子后会产生散射光, 量测散射光随时间的变化 而计算出粒子之粒径分布。

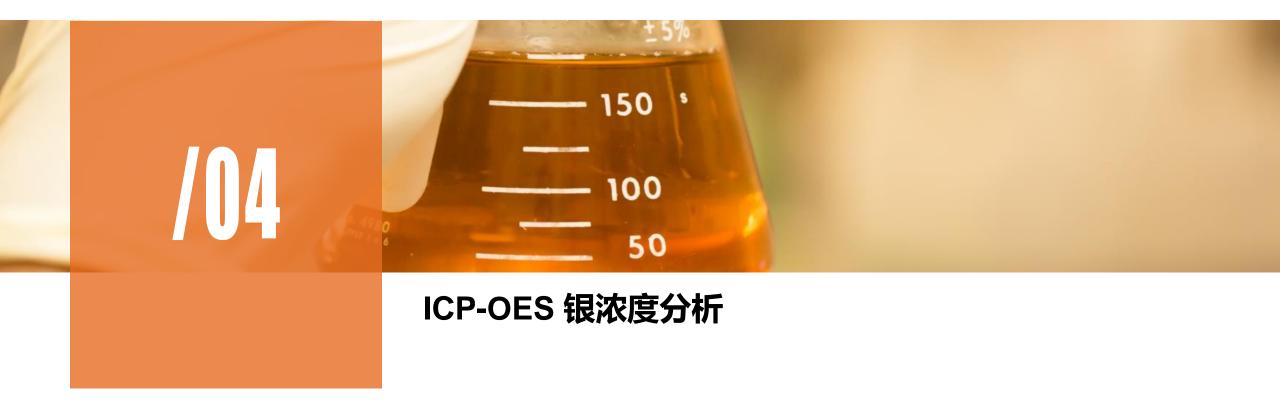






厂牌:SHIMADZU

型号: UV-1900





Total Quality. Assured.

Test Result Summary 測試結果:

Test Item	<u>Unit</u>	Test Method	Result 結果	D.
測試項目	單位	測試方法	<u>Clear brown liquid</u>	<u>RL</u>
Silver (Ag) Content 銀含量	ppm	With reference to USEPA 3052, by microwave digestion and determined by ICP-OES. 参考 USEPA 3052,以微波消化 法並用感應耦合電漿原子發射光譜儀分析。	10203	2

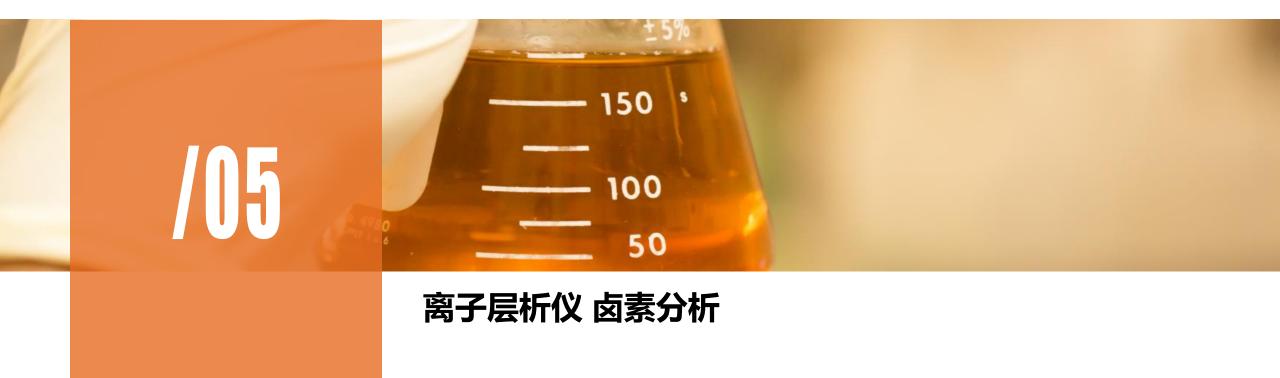
Remarks: ppm = Parts per million based on wet weight of tested sample = mg/kg

備註 百萬分之一,依據測試樣品溼重計算 = 毫克/公斤

RL = Reporting limit, quantitation limit of analyte in sample

報告極限,測試樣品之定量偵測極限

Responsibility of Chemist 分析人員 : Pelny Hsiao



SGS

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
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	參考BS EN 14582 (2016),以離子 層析儀分析. / With reference	50	n. d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	to BS EN 14582 (2016). Analysis was performed by IC.	50	n. d.
鹵素(碘)/ Halogen-Iodine(I) (CAS No.: 14362-44-8)	mg/kg		50	n. d.

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)





Total Quality. Assured.

Test Result Summary 測試結果:

Test Item	<u>Unit</u>	Test Method	Result 結果	RL		
測試項目	單位	測試方法	Clear blue liquid	<u>KL</u>		
Heavy Metal 重金屬						
Cadmium (Cd) Content 鎘含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 参考 IEC 62321-5: 2013,以微 波或酸液消化法消化樣品並用 感應耦合電漿原子發射光譜儀分析。	ND	2		
Lead (Pb) Content 鉛含量	ppm	With reference to IEC 62321-5: 2013, by microwave or acid digestion and determined by ICP-OES. 参考 IEC 62321-5: 2013,以微 波或酸液消化法消化樣品並用 感應耦合電漿原子發射光譜儀分析。	ND	2		
Mercury (Hg) Content 汞含量	ppm	With reference to IEC 62321-4: 2013+AMD1: 2017, by microwave or acid digestion and determined by ICP-OES. 参考 IEC 62321-4: 2013+AMD 1: 2017,以微波或酸液消化法消化樣品並用感應耦合電漿原子發射光譜儀分析。	ND	2		
Chromium VI (Cr ⁶⁺) Content 六價鉻含量	ppm	With reference to IEC 62321-7-2: 2017, organic solvent was used to dissolve or swell sample matrix, followed by alkaline digestion and determined by UV-Vis Spectrophotometer. 参考 IEC 62321-7-2:2017,以有機溶劑溶解或使樣品基質膨脹,再進行鹼液消化,用紫外光-可見光分光光度計分析。	ND	8		

Test Item	<u>Unit</u>	Test Method	Result 結果	DI.			
測試項目	單位	測試方法	Clear blue liquid	<u>RL</u>			
Polybrominated Biphenyls (PBBs) 多溴聯苯							
Monobrominated Biphenyls (MonoBB) 單溴聯苯	ppm		ND	5			
Dibrominated Biphenyls (DiBB) 二溴聯苯	ppm		ND	5			
Tribrominated Biphenyls (TriBB) 三溴聯苯	ppm	With reference to IEC 62321-	ND	5			
Tetrabrominated Biphenyls (TetraBB) 四溴聯苯	ppm	6: 2015, by solvent extraction and determined by GC-MS and	ND	5			
Pentabrominated Biphenyls (PentaBB) 五溴聯苯	ppm	further HPLC-DAD confirmation when necessary.	ND	5			
Hexabrominated Biphenyls (HexaBB) 六溴聯苯	ppm	參考 IEC 62321-6: 2015,以溶 劑萃取並用氣相層析質譜儀分	ND	5			
Heptabrominated Biphenyls (HeptaBB) 七溴聯苯	ppm	析,必要時會以高效液相層析 儀光二極體陣列偵測儀進行確	ND	5			
Octabrominated Biphenyls (OctaBB) 八溴聯苯	ppm	認。	ND	5			
Nonabrominated Biphenyls (NonaBB) 九溴聯苯	ppm		ND	5			
Decabrominated Biphenyl (DecaBB) 十溴聯苯	ppm		ND	5			
Polybrominated Diphenyl Ether	s (PBDE	5) 多溴聯苯醚					
Monobrominated Diphenyl Ethers (MonoBDE) 單溴聯苯醚	ppm		ND	5			
Dibrominated Diphenyl Ethers (DiBDE) 二溴聯苯醚	ppm	With reference to IEC 62321-6: 2015, by solvent extraction and determined by GC-MS and further HPLC-DAD confirmation when necessary. 参考 IEC 62321-6: 2015,以溶 劑萃取並用氣相層析質譜儀分析,必要時會以高效液相層析儀光二極體陣列偵測儀進行確認。	ND	5			
Tribrominated Diphenyl Ethers (TriBDE) 三溴聯苯醚	ppm		ND	5			
Tetrabrominated Diphenyl Ethers (TetraBDE) 四溴聯苯醚	ppm		ND	5			
Pentabrominated Diphenyl Ethers (PentaBDE) 五溴聯苯醚	ppm		ND	5			
Hexabrominated Diphenyl Ethers (HexaBDE) 六溴聯苯醚	ppm		ND	5			
Heptabrominated Diphenyl Ethers (HeptaBDE) 七溴聯苯醚	ppm		ND	5			
Octabrominated Diphenyl Ethers (OctaBDE) 八溴聯苯醚	ppm		ND	5			
Nonabrominated Diphenyl Ethers (NonaBDE) 九溴聯苯醚	ppm		ND	5			
Decabrominated Diphenyl Ether (DecaBDE) 十溴聯苯醚	ppm		ND	5			

银生命 SIL-LIFE