

## 檢測報告 Test Report



報告編號 A2240166016101001E  
Report No. A2240166016101001E

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報告抬頭公司名稱 瑞昇金屬工業股份有限公司 / 南通鈞元電子材料工業有限公司  
Company Name REDSUN METAL IND. CO., LTD / NANTONG CHUN-YUAN EDELECTRONICS IND. CO.  
shown on Report LTD.  
地 址 320030 桃園市中壢區定寧路2號 / 江蘇省南通市如東縣洋口化學工業園區黃海三路  
振洋二路交叉口  
Address NO.2, DINGNING RD., ZHONGLI DIST., TAOYUAN CITY 320030 / NANTONG  
JU-TUNG HSIEN, YANG KOU CHEMICAL INDUSTRIAL AREA, RUDONG, JIANGSU

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                 | COPPER BALL ANODE             |
| Sample Name          | COPPER BALL ANODE             |
| 樣品顏色                 | 銅色金屬                          |
| Color                | COPPER COLORED METAL          |
| 樣品接收日期               | 2024.03.28                    |
| Sample Received Date | Mar. 28, 2024                 |
| 樣品檢測日期               | 2024.03.28-2024.04.01         |
| Testing Period       | Mar. 28, 2024 to Apr. 1, 2024 |

### 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), 銻(Sb), 鉍(Be), 全氟辛烷磺酸鹽(PFOS)及其相關物質, 全氟辛酸類(PFOA)相關物質及其鹽進行測試。

### 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), Antimony (Sb), Beryllium (Be), PFOS and Related Substances, Perfluorooctanoic acid related substances and Its Salts in the submitted sample(s).

### 檢測依據/檢測結果

Test Method/Test Result(s) 請參見下頁。  
Please refer to the following page(s).



徐啟瑞

徐啟瑞

實驗室經理 Laboratory Manager

日 期  
Date

2024.04.01

No. R556661105

桃園市蘆竹區南坎路二段9號5樓之6

5F-6, No.9, Sec.2, Nankan Rd, Luzhu Dist., Taoyuan, Taiwan

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結論 Conclusion

| 測試樣品<br>Tested Sample    | 依據標準/指令<br>According to standard/directive  | 結果<br>Result |
|--------------------------|---|--------------|
| 提交樣品<br>Submitted Sample | 歐盟RoHS指令2011/65/EU及其修訂指令(EU) 2015/863<br>RoHS Directive 2011/65/EU with amendment (EU) 2015/863 | 符合<br>PASS   |

\*\*\*\*\*

符合表示檢測結果滿足歐盟RoHS指令2011/65/EU及其修訂指令(EU) 2015/863要求的限值。  
PASS means that the results shown on the report do not comply with the limits set by RoHS Directive 2011/65/EU with amendment (EU) 2015/863.

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### 檢測依據 Test Method

| 測試項目<br>Test Item(s)  | 測試方法<br>Test Method   | 測試儀器<br>Measured Equipment(s) |
|---|---|-------------------------------|
| 鉛<br>Lead (Pb)  | IEC 62321-5:2013  | ICP-OES                       |
| 鎘<br>Cadmium (Cd)   | IEC 62321-5:2013  | ICP-OES                       |
| 汞<br>Mercury (Hg)   | IEC 62321-4:2013+AMD1:2017 CSV  | ICP-OES                       |
| 六價鉻<br>Hexavalent Chromium (Cr(VI))   | IEC 62321-7-1:2015  | UV-Vis                        |
| 多溴聯苯<br>Polybrominated Biphenyls (PBBs)   | IEC 62321-6:2015  | GC-MS                         |
| 多溴二苯醚<br>Polybrominated Diphenyl Ethers (PBDEs)   | IEC 62321-6:2015  | GC-MS                         |
| 鄰苯二甲酸酯<br>Phthalates (DBP, BBP, DEHP, DIBP)   | IEC 62321-8:2017  | GC-MS                         |
| 氟<br>Fluorine (F)   | 參考EN 14582:2016<br>Refer to EN 14582:2016   | IC                            |
| 氯<br>Chlorine (Cl)  | 參考EN 14582:2016<br>Refer to EN 14582:2016   | IC                            |
| 溴<br>Bromine (Br)   | 參考EN 14582:2016<br>Refer to EN 14582:2016   | IC                            |
| 碘<br>Iodine (I)   | 參考EN 14582:2016<br>Refer to EN 14582:2016   | IC                            |
| 銻<br>Antimony(Sb)   | 參考US EPA 3050B:1996 & US EPA 6010D:2018<br>Refer to US EPA 3050B:1996 & US EPA 6010D:2018 | ICP-OES                       |
| 鈹<br>Beryllium(Be)  | 參考US EPA 3050B:1996 & US EPA 6010D:2018<br>Refer to US EPA 3050B:1996 & US EPA 6010D:2018 | ICP-OES                       |
| 全氟辛烷磺酸及全氟辛酸物質<br>Perfluorooctane sulfonates and Perfluorooctanoic acid substances (PFOS & PFOA) | 參考CEN/TS 15968:2010<br>Refer to 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                     | 限值 Limit   |
|--|-----------|-------------------------------|------------|
|  | 001       |                               |            |
| 鉛 Lead (Pb)                                  | N.D.      | 2 mg/kg                       | 1000 mg/kg |
| 鎘 Cadmium (Cd)                               | N.D.      | 2 mg/kg                       | 100 mg/kg  |
| 汞 Mercury (Hg)                               | N.D.      | 2 mg/kg                       | 1000 mg/kg |
| 六價鉻 Hexavalent Chromium (Cr(VI))             | N.D. ▼    | 0.10 µg/cm <sup>2</sup> (LOQ) | 1000 mg/kg |
| 測試項目 Tested Item(s)                          | 結果 Result | 方法檢出限 MDL                     | 限值 Limit   |
|  | 001       |                               |            |
| 多溴聯苯 Polybrominated Biphenyls (PBBs)         |           |                               |            |
| 一溴聯苯 Monobromobiphenyl                       | N.D.      | 5 mg/kg                       | 1000 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                     | 限值 Limit   |
|  | 001       |                               |            |
| 多溴二苯醚 Polybrominated Diphenyl Ethers (PBDEs) |           |                               |            |
| 一溴二苯醚 Monobromodiphenyl ether                | N.D.      | 5 mg/kg                       | 1000 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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檢測結果 Test Result(s)

| 測試項目 Tested Item(s)  | 結果 Result | 方法檢出限 MDL | 限值 Limit   |
|--|-----------|-----------|------------|
|  | 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)<br>CAS#:85-68-7            | N.D.      | 50 mg/kg  | 1000 mg/kg |
| 鄰苯二甲酸二(2-乙基)己酯 Di-(2-ethylhexyl) phthalate (DEHP)<br>CAS#:117-81-7 | N.D.      | 50 mg/kg  | 1000 mg/kg |
| 鄰苯二甲酸二丁酯 Dibutyl phthalate (DBP)<br>CAS#:84-74-2                   | N.D.      | 50 mg/kg  | 1000 mg/kg |
| 鄰苯二甲酸二異丁酯 Diisobutyl phthalate (DIBP)<br>CAS#:84-69-5              | N.D.      | 50 mg/kg  | 1000 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       |           |            |
| 鈹 Beryllium (Be)   | 10 mg/kg  | 2 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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檢測結果 Test Result(s)

| 測試項目Tested Item(s)   | CAS No.    | 結果Result | 方法檢出限<br>MDL |
|--|------------|----------|--------------|
|  |            | 001      |              |
| 全氟辛基磺酸 Perfluorooctanesulfonic acid (PFOS)   | 1763-23-1  | 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-辛磺醯胺 N-Methylperfluoro-1-octanesulfonamide (N-Me-FOSA)                          | 31506-32-8 | N.D.     | 0.05 mg/kg   |
| N-乙基全氟辛基磺醯胺乙醇 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-辛基磺醯胺 2-(N-Methylperfluoro-1-octanesulfonamido)-ethanol (N-Me-FOSE) | 24448-09-7 | N.D.     | 0.05 mg/kg   |
| 全氟辛酸 Perfluorooctanoic Acid (PFOA)   | 335-67-1   | N.D.     | 0.01 mg/kg   |
| 全氟辛烷磺醯胺 Perfluorooctane sulfonamide (PFOSA)  | 754-91-6   | N.D.     | 0.01 mg/kg   |

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### 全氟辛烷磺酸和全氟辛酸清單List of Perfluorooctanesulfonic acid and Perfluorooctanoic acid

| 物質名稱Substance Name(s)  | CAS No.     |
|--|-------------|
| <b>全氟辛烷磺酸Perfluorooctanesulfonic acid(PFOS)</b>  |             |
| 全氟辛烷磺酸鉀<br>Perfluorooctanesulfonic acid, potassium salt  | 2795-39-3   |
| 全氟辛烷磺酸鋰<br>Perfluorooctanesulfonic acid, lithium salt  | 29457-72-5  |
| 全氟辛烷磺酸銨<br>Perfluorooctanesulfonic acid, ammonium salt   | 29081-56-9  |
| 全氟辛烷磺酸二乙醇銨<br>Perfluorooctane sulfonate diethanolamine salt  | 70225-14-8  |
| 全氟辛烷磺酸四乙基銨<br>Perfluorooctanesulfonic acid, tetraethylammonium salt                                    | 56773-42-3  |
| 全氟辛烷磺酸二癸二甲基銨<br>Didecyl dimethyl ammonium perfluorooctane sulfonate                                    | 251099-16-8 |
| 全氟辛烷磺酰氟<br>Perfluoro-1-octanesulfonyl fluoride   | 307-35-7    |
| 全氟辛烷磺酸鈉<br>Sodium perfluorooctane sulfonate  | 4021-47-0   |
| 全氟辛烷磺酸鎂<br>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) | 91036-71-4  |
| 全氟辛基磺酸哌啶<br>Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8 heptafluorooctanesulfonate                    | 71463-74-6  |
| <b>全氟辛酸Perfluorooctanoic acid(PFOA)</b>  |             |
| 全氟辛酸銨<br>Ammonium pentadecafluorooctanoate   | 3825-26-1   |
| 全氟辛酸鈉<br>Sodium perfluorooctanoate   | 335-95-5    |
| 全氟辛酸鉀<br>Potassium perfluorooctanoate  | 2395-00-8   |
| 全氟辛酸銀<br>Silver perfluorooctanoate   | 335-93-3    |
| 全氟辛氟<br>Perfluorooctanoyl fluoride   | 335-66-0    |

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**樣品/部位描述 Sample/Part Description**

| 序號<br>No. | CTI樣品ID<br>CTI Sample ID | 描述<br>Description    |
|-----------|--------------------------|----------------------|
| 1         | 001                      | 銅色金屬<br>Copper metal |

**備註:** 對於檢測鉛, 鎘, 汞, 鉍, 銻之樣品已消解完全。

-N.D. = 未檢出 (小於方法檢出限或定量限)

-mg/kg = ppm = 百萬分之一

-1000 mg/kg = 0.1%

-LOQ = 定量限, 六價鉻的定量限為0.10 µg/cm<sup>2</sup>-▼六價鉻濃度小於0.10 µg/cm<sup>2</sup>, 樣品未檢出六價鉻。由於未獲知樣品的存儲條件和生產日期, 樣品的六價鉻測試結果僅能代表測試時樣品含六價鉻的狀態。**Remark:** **The sample(s) had been dissolved totally tested for Lead, Cadmium, Mercury, Beryllium, Antimony.**

-MDL = Method Detection Limit

-N.D. = Not Detected (&lt;MDL or LOQ)

-mg/kg = ppm = parts per million

-1000 mg/kg = 0.1%

-LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 µg/cm<sup>2</sup>-▼The sample is negative for Cr(VI) – The Cr(VI) concentration is below 0.10 µg/cm<sup>2</sup>. The coating is considered a non-Cr(VI) based coating. Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.**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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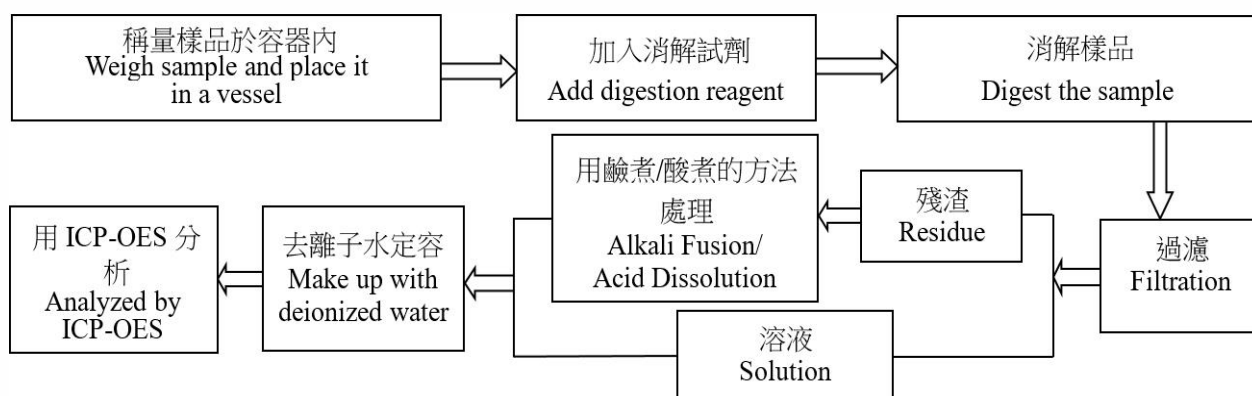
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## 檢測流程 Test Process

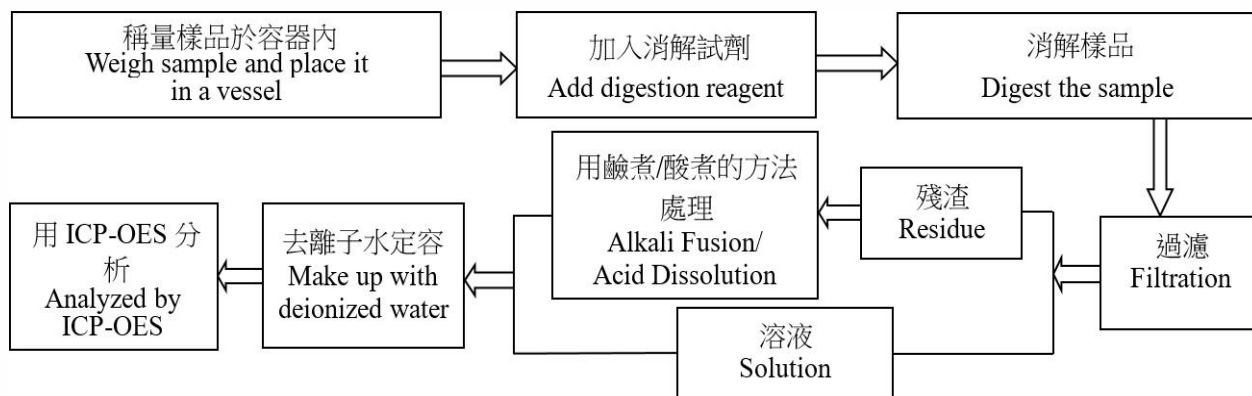
### 1. 鉛(Pb)，鎘(Cd)

Lead (Pb), Cadmium (Cd)



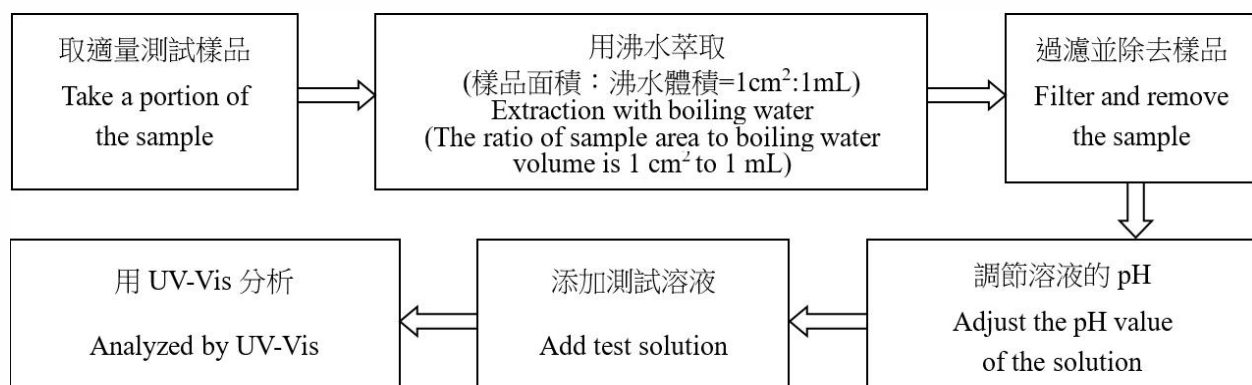
### 2. 汞(Hg)

Mercury (Hg)



### 3. 六價鉻(Cr(VI))

Hexavalent Chromium (Cr(VI))



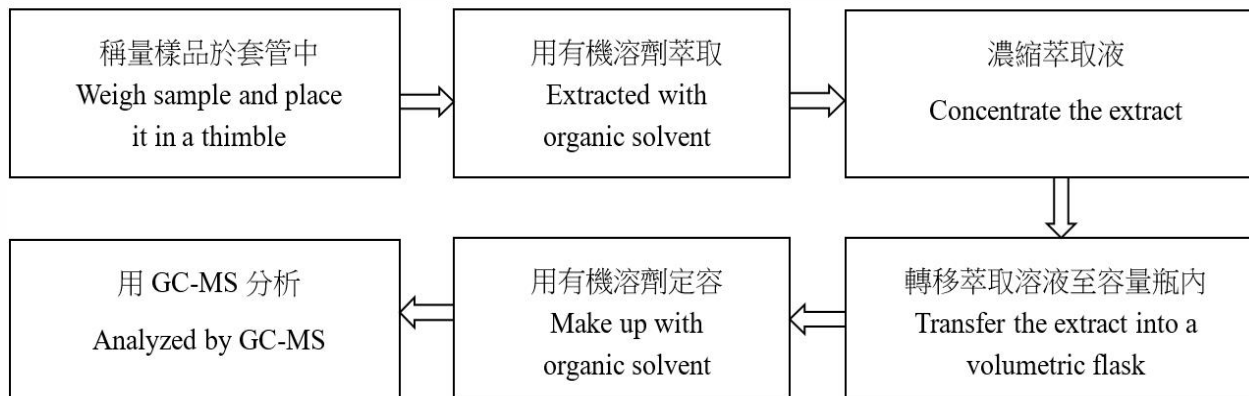
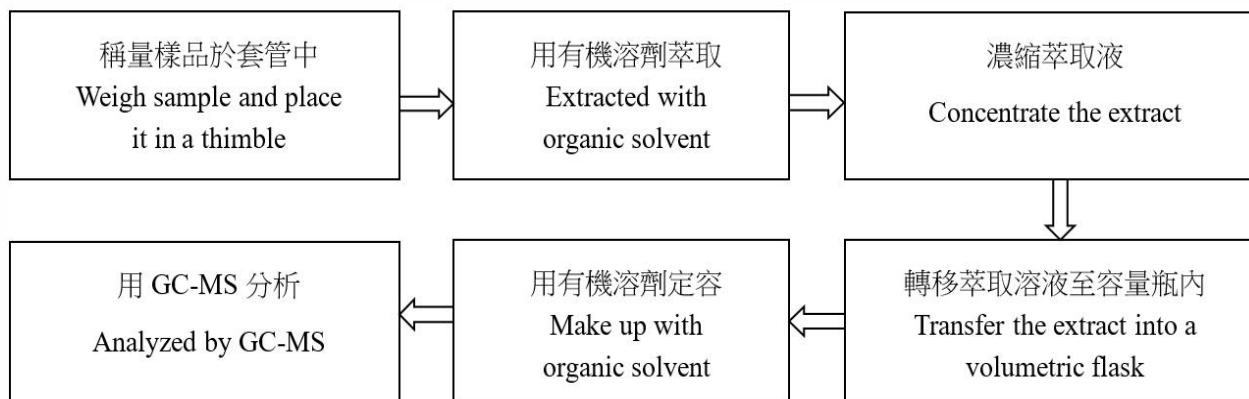
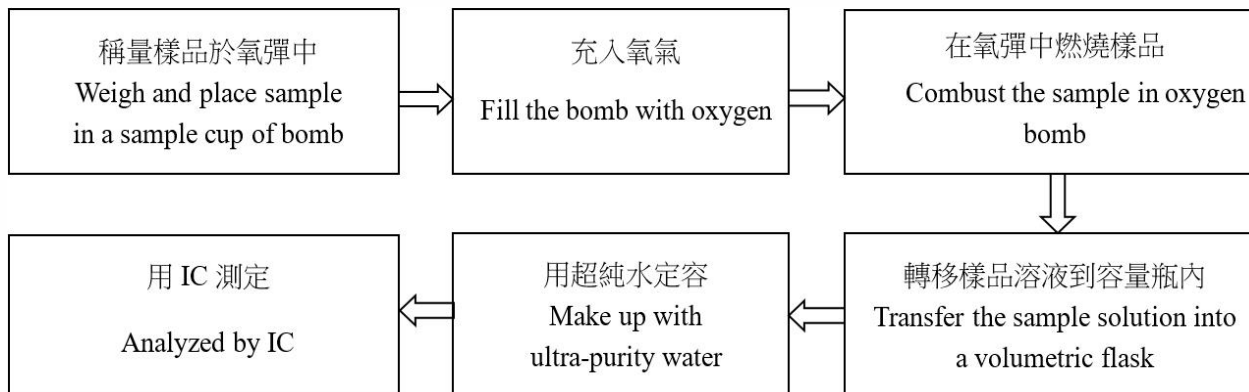
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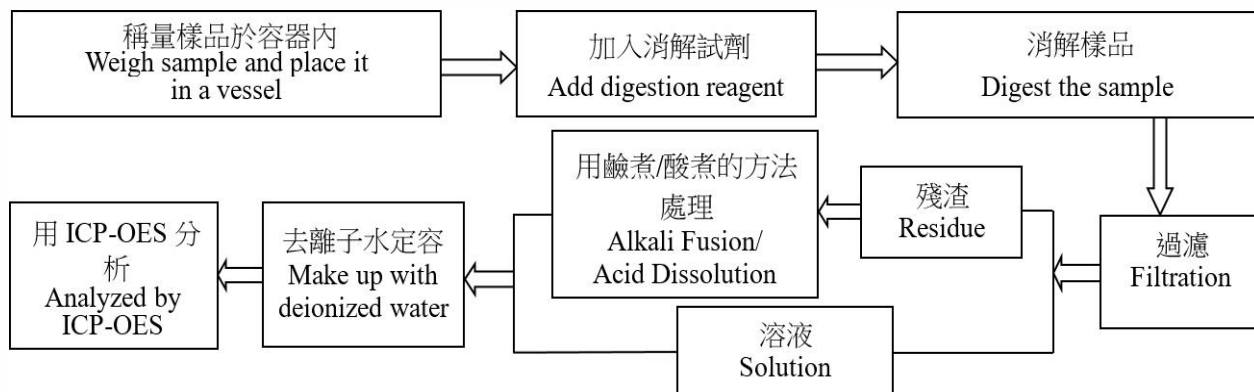
**4. 多溴聯苯(PBBs)，多溴二苯醚(PBDEs)****Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)****5. 鄰苯二甲酸酯(DBP, BBP, DEHP, DIBP)****Phthalates (DBP, BBP, DEHP, DIBP)****6. 氟 (F)，氯 (Cl)，溴 (Br)，碘 (I)****Fluorine (F), Chlorine (Cl), Bromine (Br), Iodine (I)**

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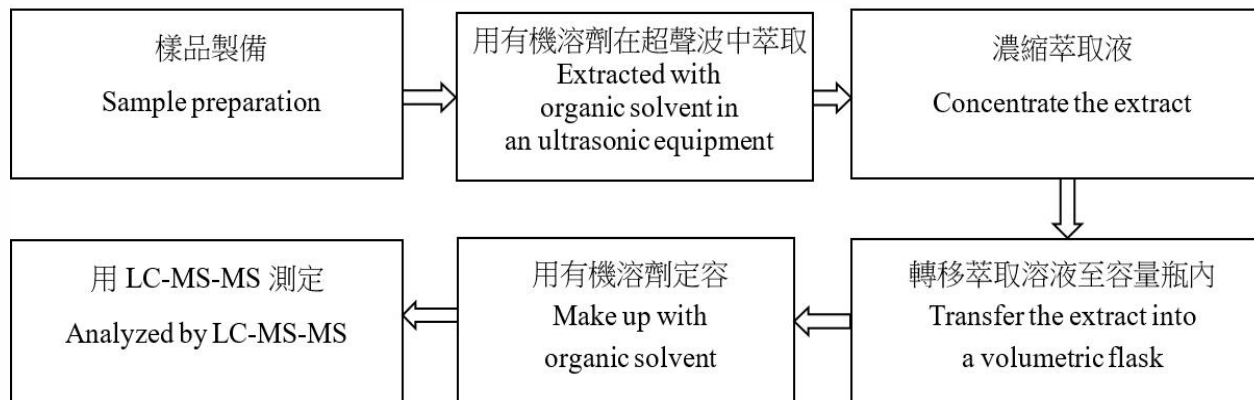
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## 7. 鈹(Be)，銻(Sb) Beryllium(Be), Antimony(Sb)



## 8. 全氟辛烷磺酸鹽(PFOS)及其相關物質，全氟辛酸類(PFOA)相關物質及其鹽 PFOS and Related Substances, Perfluorooctanoic acid related substances and Its Salts

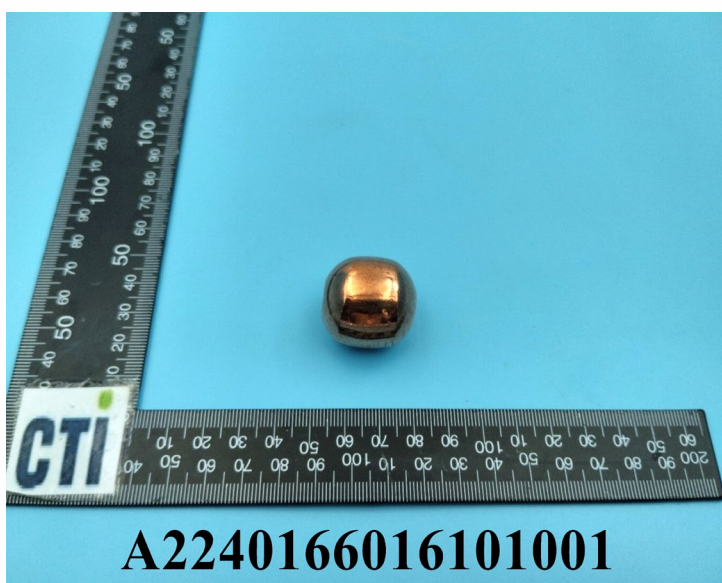


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## 樣品圖片 Photo(s) of the sample(s)



### 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；  
This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. 報告抬頭公司名稱及位址、樣品及樣品資訊由申請者提供，申請者應對其真實性負責，CTI未核實其真實性；  
The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. 本報告檢測結果僅對受測樣品負責；  
The result(s) shown in this report refer(s) only to the sample(s) tested;
4. 未經CTI書面同意，不得部分複製本報告；  
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