

## 测试报告

No. CANEC2103822808

日期: 2021年04月08日 第1页,共19页

建滔积层板控股有限公司  
香港新界沙田安耀街三号汇达大厦二十三楼

以下测试之样品是由申请者所提供及确认: KB-5150

SGS工作编号: CP21-010894 - GZ  
型号: KB-5150  
客户参考信息: KB-5150A,KB-5150&,KB-5150H  
样品接收日期: 2021年03月16日  
测试周期: 2021年03月16日 - 2021年04月07日  
测试要求: 根据客户要求测试  
测试方法: 请参见下一页  
测试结果: 请参见下一页  
结论: 基于所送样品进行的测试, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苯酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的测试结果符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

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授权签名

李嘉欣

Jessie Li 李嘉欣  
批准签署人

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## 测试报告

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测试结果:

### 测试样品描述:

样品编号	SGS样品ID	描述
SN1	CAN21-038228.002	黄色单面覆铜板 (取用无红色"KB"印字部分测试)

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

### RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

测试方法: 参考IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES, UV-Vis 和 GC-MS 进行分析.

测试项目	限值	单位	MDL	002
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	8
汞 (Hg)	1,000	mg/kg	2	ND
六价铬(Cr(VI))	1,000	mg/kg	8	ND
多溴联苯之和(PBBs)	1,000	mg/kg	-	ND
一溴联苯	-	mg/kg	5	ND
二溴联苯	-	mg/kg	5	ND
三溴联苯	-	mg/kg	5	ND
四溴联苯	-	mg/kg	5	ND
五溴联苯	-	mg/kg	5	ND
六溴联苯	-	mg/kg	5	ND
七溴联苯	-	mg/kg	5	ND
八溴联苯	-	mg/kg	5	ND
九溴联苯	-	mg/kg	5	ND
十溴联苯	-	mg/kg	5	ND
多溴二苯醚之和(PBDEs)	1,000	mg/kg	-	ND
一溴二苯醚	-	mg/kg	5	ND
二溴二苯醚	-	mg/kg	5	ND
三溴二苯醚	-	mg/kg	5	ND
四溴二苯醚	-	mg/kg	5	ND
五溴二苯醚	-	mg/kg	5	ND



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日期: 2021年04月08日 第3页,共19页

测试项目	限值	单位	MDL	002
六溴二苯醚	-	mg/kg	5	ND
七溴二苯醚	-	mg/kg	5	ND
八溴二苯醚	-	mg/kg	5	ND
九溴二苯醚	-	mg/kg	5	ND
十溴二苯醚	-	mg/kg	5	ND
邻苯二甲酸二丁酯 (DBP)	1,000	mg/kg	50	ND
邻苯二甲酸丁苄酯(BBP)	1,000	mg/kg	50	ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	1,000	mg/kg	50	ND
邻苯二甲酸二异丁酯(DIBP)	1,000	mg/kg	50	ND

备注:

(1)最大允许极限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列

[https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)

(3) 2021年7月22号开始, DEHP, BBP, DBP 和 DIBP的限制适用于医疗器械, 包括体外医疗器械, 监控仪表, 包括工业监测和控制仪器。

## 元素分析

测试方法: SGS内部方法(GZTC CHEM-TOP-004-01, 参考EPA 3052: 1996), 采用ICP-OES进行分析。

测试项目	单位	MDL	002
砷 (As)	mg/kg	10	ND
锑 (Sb)	mg/kg	10	7550

## 四溴双酚-A

测试方法: SGS内部方法(GZTC CHEM-TOP-065, 参考EPA 3540C:1996 & EPA 8270E:2017), 采用LC-MS/MS进行分析。

测试项目	单位	MDL	002
四溴双酚-A	mg/kg	5	ND

## 红磷

测试方法: SGS内部方法(GZTC CHEM-TOP-215-01), 采用PY-GC/MS / ICP-OES 进行分析。



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测试项目	单位	MDL	002
红磷	mg/kg	500	ND

### 邻苯二甲酸盐(或酯)

测试方法: 参考EN 14372: 2004的方法测定, 采用GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	002
邻苯二甲酸二丁酯 (DBP)	84-74-2	%(w/w)	0.003	ND
邻苯二甲酸丁苄酯 (BBP)	85-68-7	%(w/w)	0.003	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	117-81-7	%(w/w)	0.003	ND
邻苯二甲酸二异壬酯 (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
邻苯二甲酸二正辛酯 (DNOP)	117-84-0	%(w/w)	0.003	ND
邻苯二甲酸二异癸酯 (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
邻苯二甲酸二甲酯 (DMP)	131-11-3	%(w/w)	0.003	ND
邻苯二甲酸二乙酯 (DEP)	84-66-2	%(w/w)	0.003	ND
邻苯二甲酸二丙酯 (DPrP)	131-16-8	%(w/w)	0.003	ND
邻苯二甲酸二异丁酯 (DIBP)	84-69-5	%(w/w)	0.003	ND
邻苯二甲酸二戊酯 (DPENP/ DnPP)	131-18-0	%(w/w)	0.003	ND
邻苯二甲酸二正己酯 (DnHP)	84-75-3	%(w/w)	0.003	ND
邻苯二甲酸二环己酯 (DCHP)	84-61-7	%(w/w)	0.003	ND
邻苯二甲酸二苯酯 (DPhP)	84-62-8	%(w/w)	0.003	ND
邻苯二甲酸二苄酯 (DBzP)	523-31-9	%(w/w)	0.003	ND
邻苯二甲酸二壬酯 (DNP)	84-76-4	%(w/w)	0.003	ND
邻苯二甲酸二异辛酯 (DIOP)	27554-26-3	%(w/w)	0.010	ND
邻苯二甲酸二(2-甲氧基乙基)酯 (DMEP)	117-82-8	%(w/w)	0.003	ND
邻苯二甲酸二烯丙酯 (DAP)	131-17-9	%(w/w)	0.003	ND
邻苯二甲酸癸基辛基酯 (nDnOP)	119-07-3	%(w/w)	0.003	ND
邻苯二甲酸二癸酯 (DnDP)	84-77-5	%(w/w)	0.003	ND
邻苯二甲酸二异戊酯 (DIPP)	605-50-5	%(w/w)	0.003	ND
邻苯二甲酸正戊基异戊基酯 (nPIPP)	776297-69-9	%(w/w)	0.003	ND
邻苯二甲酸二(C6-8支链)烷基酯(富C7) (DIHP)	71888-89-6	%(w/w)	0.010	ND
邻苯二甲酸二(C7-11支链与直链)烷基(醇)酯 (DHNUP)	68515-42-4	%(w/w)	0.010	ND
己二酸二(2-乙基己基)酯(DEHA)	103-23-1	%(w/w)	0.003	ND



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测试项目	CAS NO.	单位	MDL	002
邻苯二甲酸二(4-甲基-2-戊基)酯 (BMPP)	146-50-9	%(w/w)	0.003	ND
邻苯二甲酸二(2-乙氧基)乙酯 (DEEP)	605-54-9	%(w/w)	0.003	ND
邻苯二甲酸二(2-丁氧基)乙酯 (DBEP)	117-83-9	%(w/w)	0.003	ND
邻苯二甲酸双十一烷酯 (DUDP)	3648-20-2	%(w/w)	0.003	ND
己二酸二异壬酯(DINA)	33703-08-1	%(w/w)	0.010	ND
邻苯二甲酸双十三烷酯 (DTDP)	119-06-2	%(w/w)	0.003	ND
偏苯三酸三(2-乙基己)酯 (TOTM)	3319-31-1	%(w/w)	0.003	ND
对苯二甲酸二(2-乙基己)酯 (DOTP)	6422-86-2	%(w/w)	0.003	ND
邻苯二甲酸二庚酯 (DnHpP)	3648-21-3	%(w/w)	0.003	ND
乙酰柠檬酸三丁酯 (Citroflex, ATBC)	77-90-7	%(w/w)	0.010	ND
邻苯二甲酸二(支链与直链)戊基酯 (DPP)	84777-06-0	%(w/w)	0.010	ND
邻苯二甲酸二(支链与直链)己基酯 (DHP)	68515-50-4	%(w/w)	0.010	ND
邻苯二甲酸二(2-丙基庚)酯(DPHpP)	53306-54-0	%(w/w)	0.010	ND

备注:

(1) DBP、BBP、DEHP、DIBP参考信息: 欧盟决议(EC) No 1907/2006 REACH 附录XVII及其修正法案(EU) 2018/2005 第51条:

i) 不允许DBP、BBP、DEHP、DIBP单一质量浓度或质量浓度总和等于或高于0.1%的可塑性物料用于玩具和儿童护理品。

ii) 当玩具和儿童护理品中的可塑性物料含DBP、BBP、DEHP单一质量浓度或质量浓度总和等于或高于0.1%时,不得投放市场。另外,当玩具和儿童护理品中的可塑性物料含DIBP单一质量浓度或DBP、BBP、DEHP、DIBP质量浓度总和等于或高于0.1%时,2020年7月7日后不得投放市场。

iii) 当成品中的可塑性物料含DBP、BBP、DEHP、DIBP单一质量浓度或质量浓度总和等于或高于0.1%时,2020年7月7日后不得投放市场。

详细信息请参见Regulation (EU) 2018/2005

(2) DINP、DNOP、DIDP参考信息: 欧盟决议(EC) No 1907/2006 REACH 附录XVII及修正法案(EU) 2015/326 第52条:

i) 不允许DINP、DNOP、DIDP质量浓度高于0.1%的可塑性物料用于可放入儿童口中的玩具和儿童护理品。

ii) 当可放入儿童口中的玩具和儿童护理品中的可塑性物料含DINP, DNOP, DIDP质量浓度高于0.1%时,不得投放市场。

详细信息请参见Regulation (EU) 2015/326

## 甲醛

测试方法: 参考 ISO 14184-1:2011, 用 UV-Vis分析。

测试项目	CAS NO.	单位	MDL	002
甲醛	50-00-0	mg/kg	16	ND

## 六溴环十二烷(HBCDD)



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测试方法: SGS 内部方法(GZTC CHEM-TOP-073, 参考EPA 3550C:2007), 采用GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	002
六溴环十二烷(HBCDD) 及其非对映异构体( $\alpha$ -HBCDD, $\beta$ -HBCDD, $\gamma$ -HBCDD)	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8	mg/kg	10	ND

### 全氟辛酸(PFOA)及其盐 & 全氟辛烷磺酸 (PFOS)及其衍生物

测试方法: 参考CEN/TS 15968:2010, 采用LC-MS或LC-MS/MS进行分析。

测试项目	CAS NO.	单位	MDL	002
全氟辛酸 (PFOA)及其盐+	335-67-1	mg/kg	0.010	ND
全氟辛烷磺酸 (PFOS)^	1763-23-1	mg/kg	0.010	ND
全氟辛基磺酰胺(PFOSA)	754-91-6	mg/kg	0.010	ND
N-甲基全氟辛烷磺酰胺(MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-乙基全氟辛烷磺酰胺(EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-甲基全氟辛基磺酰胺)乙醇(MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-乙基全氟辛基磺酰胺)乙醇(EtFOSE)	1691-99-2	mg/kg	0.010	ND
全氟辛烷磺酸 (PFOS)及其衍生物	-	mg/kg	-	ND

备注:

- (1) + PFOA 及其盐包含PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) 和 APFO (CAS No.: 3825-26-1);
- (2) ^ 全氟辛烷磺酸 (PFOS)包含 PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH<sub>4</sub> (CAS No.: 29081-56-9), PFOS-NH(OH)<sub>2</sub> (CAS No.: 70225-14-8), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No.: 56773-42-3), PFOS-DDA (CAS No.:251099-16-8) 和POSF (CAS No.: 307-35-7)

### 有机锡

测试方法: SGS内部方法 (GZTC CHEM-TOP-031, 参考ISO 17353:2004), 采用GC-MS进行分析。

测试项目	单位	MDL	002
二丁基锡(DBT)	mg/kg	0.02	ND
三丁基锡(TBT)	mg/kg	0.02	ND
三苯基锡(TPhT)	mg/kg	0.02	ND
二辛基锡(DOT)	mg/kg	0.02	ND



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**欧盟POPs法规(EU) 2019/1021-短链氯化石蜡 (SCCPs)**

测试方法: 参考ISO 18219: 2015, 采用GC-NCI-MS / GC-ECD 进行分析。

测试项目	限值	单位	MDL	002
短链氯化石蜡(C10-C13) (SCCPs)	1500	mg/kg	50	ND
评论				符合

**AfPS GS 2019:01 PAK-多环芳香烃**

测试方法: 参考AfPS GS 2019:01 PAK测试, 采用 GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	002
萘 (NAP)	91-20-3	mg/kg	0.1	ND
菲 (PHE)	85-01-8	mg/kg	0.1	ND
蒽 (ANT)	120-12-7	mg/kg	0.1	ND
荧蒽 (FLT)	206-44-0	mg/kg	0.1	ND
芘 (PYR)	129-00-0	mg/kg	0.1	ND
苯并(a)蒽 (BaA)	56-55-3	mg/kg	0.1	ND
蒽 (CHR)	218-01-9	mg/kg	0.1	ND
苯并(b)荧蒽 (BbF)	205-99-2	mg/kg	0.1	ND
苯并(j)荧蒽 (BjF)	205-82-3	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	207-08-9	mg/kg	0.1	ND
苯并(a)芘 (BaP)	50-32-8	mg/kg	0.1	ND
苯并(e)芘 (BeP)	192-97-2	mg/kg	0.1	ND
茚并(1,2,3-c,d)芘 (IPY)	193-39-5	mg/kg	0.1	ND
二苯并(a,h)蒽(DBA)	53-70-3	mg/kg	0.1	ND
苯并(g,h,i)芘(二苯并(a,h)蒽) (BPE)	191-24-2	mg/kg	0.1	ND
4项多环芳香烃总和(菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT))	-	mg/kg	-	ND
15项多环芳香烃总和	-	mg/kg	-	ND



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### AfPS (德国产品安全委员会):多环芳香烃的要求

参数 (mg/kg)	1类	2类		3类	
	设计意图为放入口中的材料,或与皮肤长期接触(超过30秒)的材料用于-2009/48/EC定义的玩具,或-供3岁以下儿童 <sup>a,b</sup> 使用。	不属于第1类,设计意图或可预见 <sup>d</sup> 与皮肤长期接触(超过30秒)或短期重复接触 <sup>e</sup> 的材料		不属于第1和2类,设计意图或可预见与皮肤短期接触(不超过30秒)材料	
		a.供儿童使用的产品	b.其他产品	a.供儿童使用的产品	b.其他产品
苯并(a)芘(BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(e)芘(BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(a)蒽(BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(b)荧蒽(BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(j)荧蒽(BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(k)荧蒽(BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
蒽(CHR)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
二苯并(a,h)蒽(DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(g,h,i)花(二萘嵌苯)(BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
茚并(1,2,3-c,d)芘(IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
菲(PHE), 芘(PYR), 蒽(ANT), 荧蒽(FLT)	< 1 (总和)	< 5 (总和)	< 10 (总和)	< 20 (总和)	< 50 (总和)
萘(NAP)	< 1	< 2		< 10	
15 PAH之和	< 1	< 5	< 10	< 20	< 50

#### 注释:

- <sup>a</sup> 儿童是指法定年龄未满 14 周岁的人。
- <sup>b</sup> 供儿童使用包括儿童的主动接触或被动接触。
- <sup>c</sup> “短期重复接触”的定义摘自 REACH 附录 XVII 第 50 条修正案 (EC) No. 1272/2013。
- <sup>d</sup> 根据德国产品安全法 (ProdSG) (第一章第 2 条第 28 款) 的定义, “可预见的使用”是指将产品投放市场的人无意但可以合理预见的方式使用产品。

#### 备注:

德国产品安全委员会 (AfPS) 于 2020 年 4 月 10 日发布了关于多环芳香烃 (PAHs) 的新文件 (AfPS GS 2019:01 PAK), 该文件将于 2020 年 7 月 1 日起用于 GS-MARK 认证。

### 苯并三唑类紫外吸收剂

测试方法: SGS内部方法 (GZTC CHEM-TOP-102, 参考EPA 3550C:2007), 采用 GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	002
2-(2'-羟基-3',5'-二叔丁基苯基)-苯并三唑	3846-71-7	mg/kg	5	ND



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## 测试报告

No. CANEC2103822808

日期: 2021年04月08日 第9页,共19页

测试项目	CAS NO.	单位	MDL	002
2-(2'-羟基-3',5'-二叔丁基苯基)-5-氯代苯并三唑	3864-99-1	mg/kg	5	ND
2-(2'-羟基-3',5'-二叔戊基苯基)苯并三唑	25973-55-1	mg/kg	5	ND
2-(2'-羟基-3'-异丁基-5'-叔丁基苯基)苯并三唑	36437-37-3	mg/kg	5	ND

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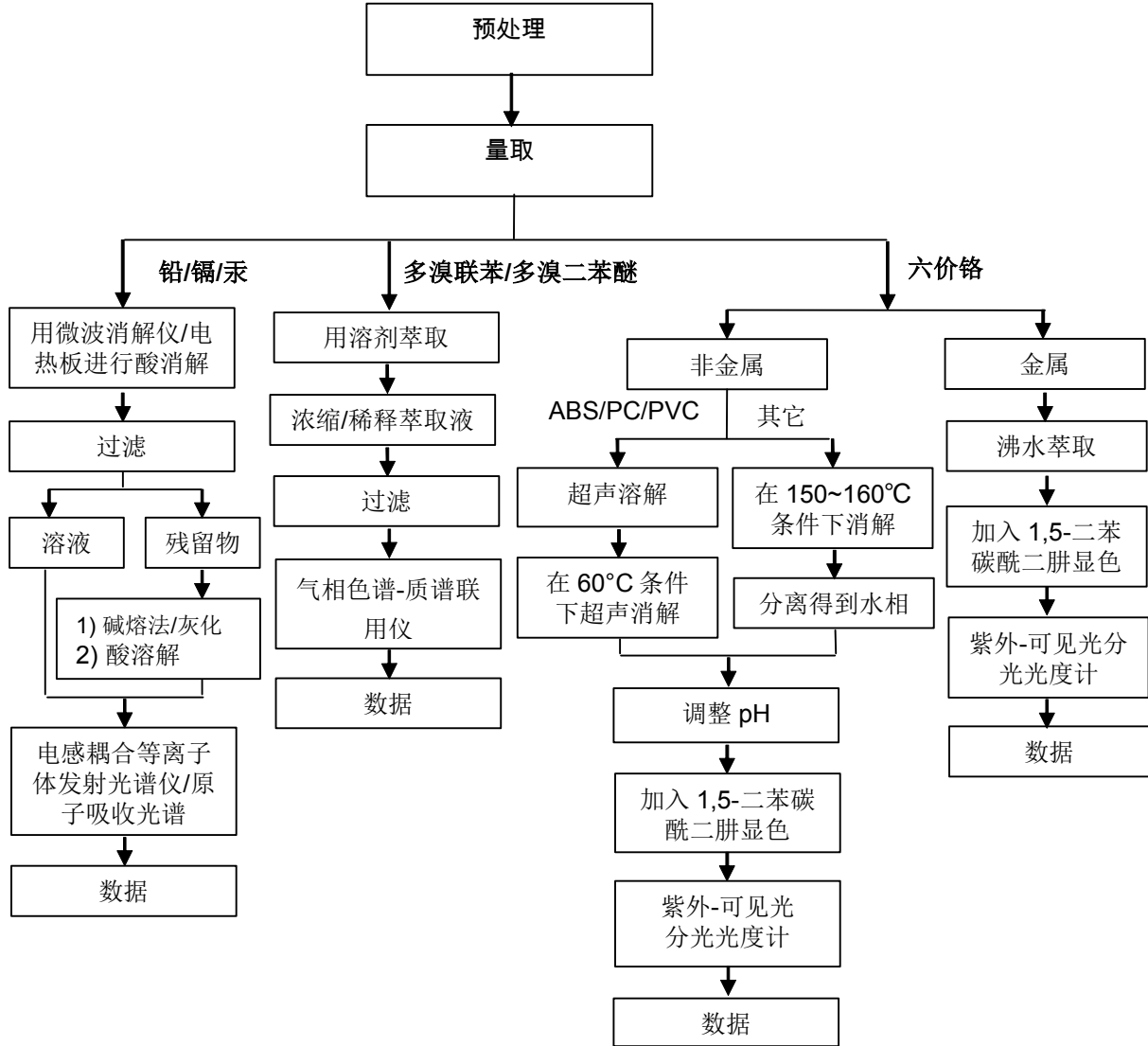
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## Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs 测试流程图

- 1) 分析人员: 张梓路 / 胡香云
- 2) 项目负责人: 汪丹 / 刘琼
- 3) 样品按照下述流程被完全消解 (六价铬和多溴联苯/多溴二苯醚测试除外)。



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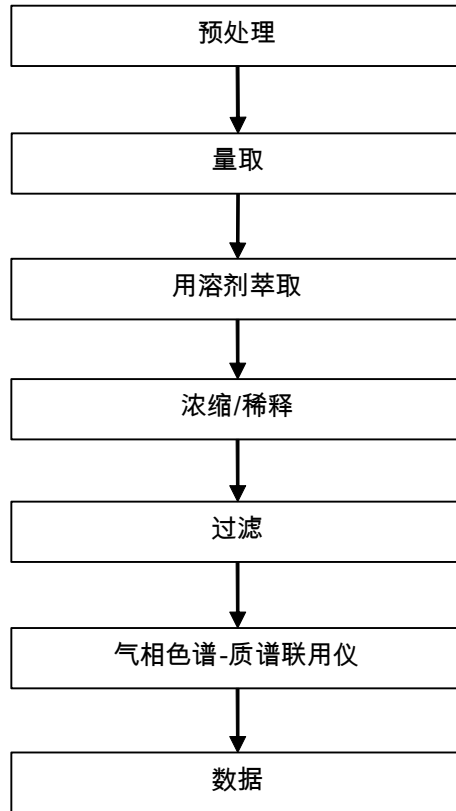
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附件

### Phthalates 测试流程图

- 1) 分析人员: 胡香云
- 2) 项目负责人: 刘琼



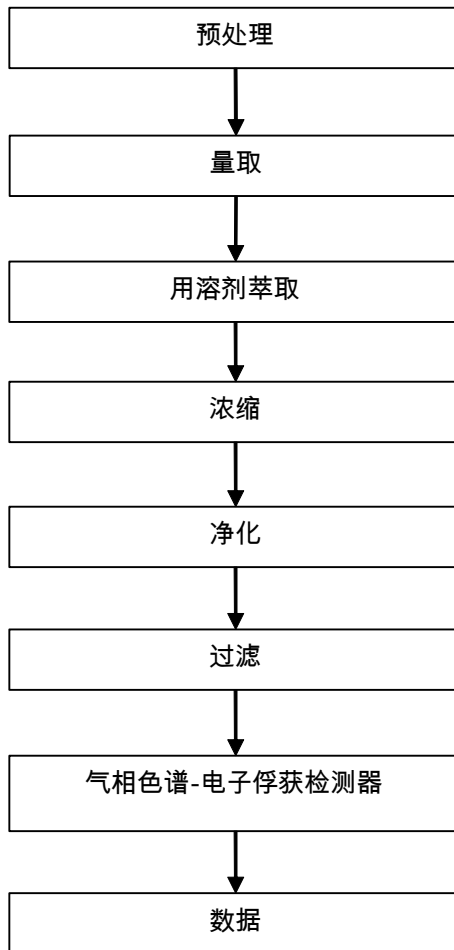
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## SCCP/MCCP/LCCP 测试流程图

- 1) 分析人员：陈美娜
- 2) 项目负责人：刘琼



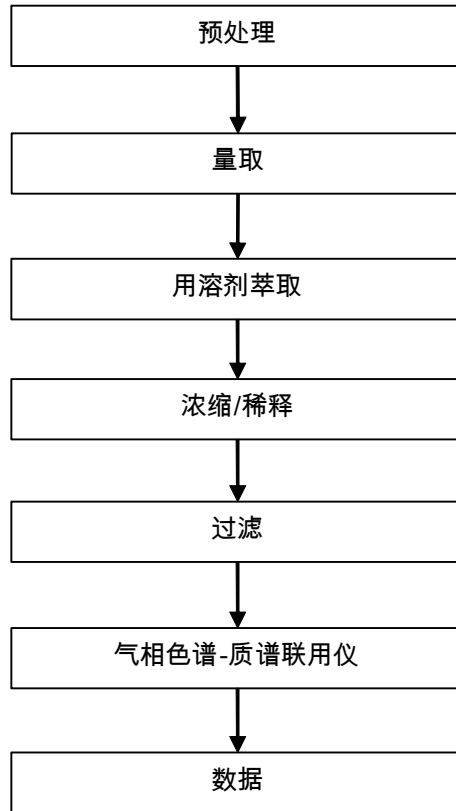
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HBCDD 测试流程图

- 1) 分析人员：胡香云
- 2) 项目负责人：刘琼



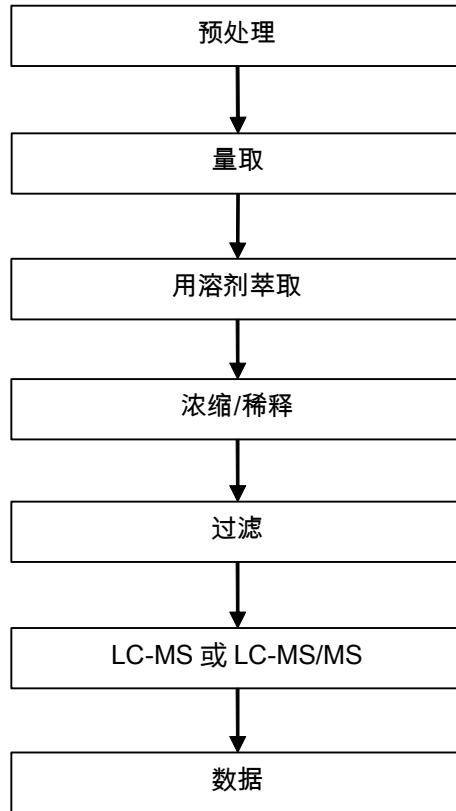
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### PFOA / PFOS 测试流程图

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- 2) 项目负责人: 刘琼



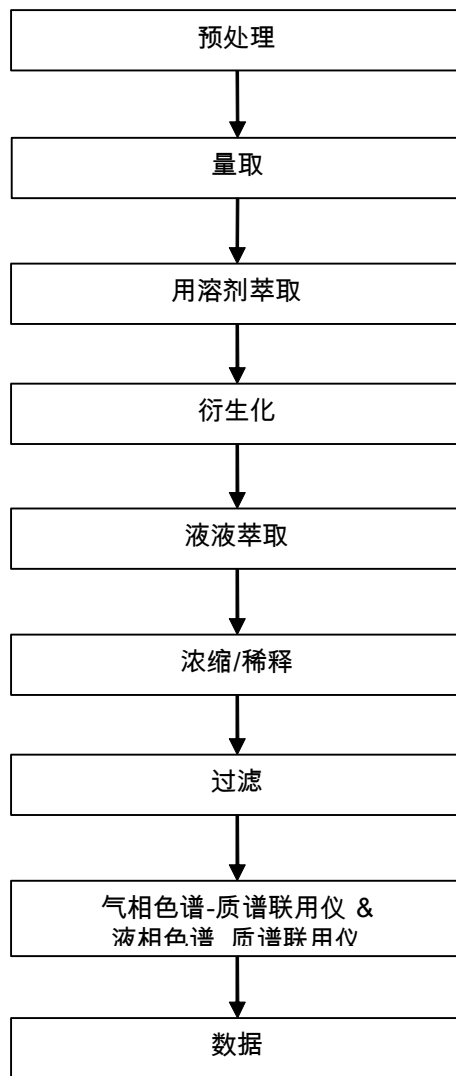
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TBBP-A 测试流程图

- 1) 分析人员: 李玉金
- 2) 项目负责人: 刘琼



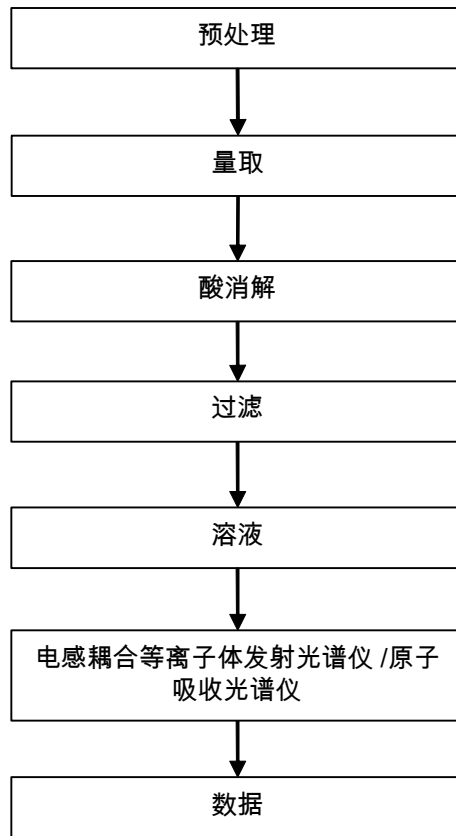
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### 元素测试流程图

- 1) 分析人员：张梓路
- 2) 项目负责人：汪丹



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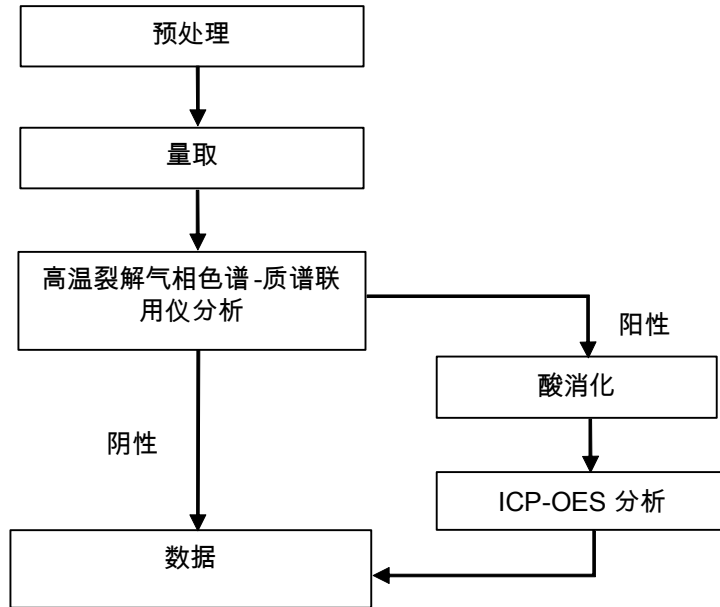
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红磷测试流程图

- 1) 分析人员：黄迅
- 2) 项目负责人：刘琼



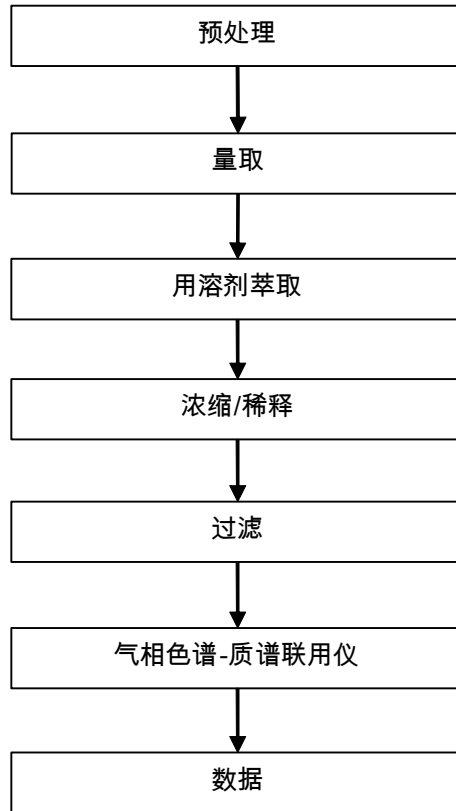
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### PAHs 测试流程图

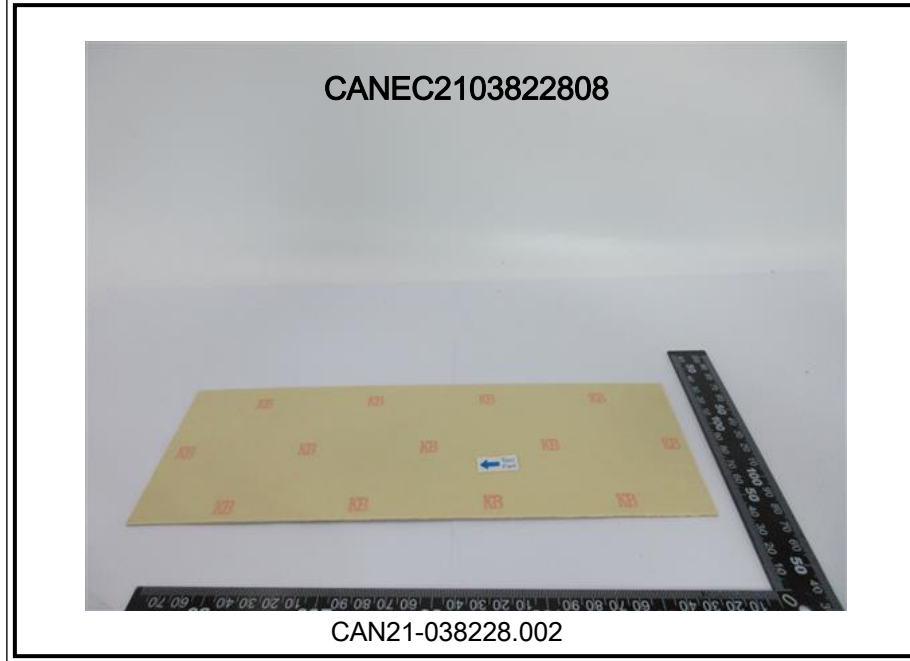
- 1) 分析人员: 张金花
- 2) 项目负责人: 刘琼



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