



Test Report

No.: GZ0912123765/CHEM

Date: JAN 08, 2010

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TATUNG COATINGS (KUNSHAN) CO., LTD
NO.227 QINGYANG NORTH ROAD, ZHOUSHI TOWN, KUNSHAN CITY, JIANGSU CHINA

The following sample(s) was/were submitted and identified on behalf of the applicant as 色料 E-5413P

SGS Job No. : GZ12328496EC
SGS Internal Reference No. : 12.3
Date of Sample Received : DEC 31, 2009
Testing Period : DEC 31, 2009 TO JAN 08, 2010

Test Requested : A: Fifteen (15) Substances of Very High Concern (SVHC) screening in addition of cyclododecane by specific client's request
Based on the SVHC candidate list published by European Chemicals Agency (ECHA) on 2008 October 28, regarding Regulation (EC) No 1907/2006 concerning REACH.

B~E: Selected test (s) as requested by client.

Test Method : Please refer to next page(s).

Test Result(s) : Please refer to next page(s).

Summary : A: According to the specified scope and analytical technique, concentrations of all 15 SVHC are <0.1% in the submitted sample(s).

Conclusion : B: Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2002/95/EC and its subsequent amendments.

Signed for and on behalf of
SGS-CSTC Ltd.

Manson Yang
Sr. Engineer

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Guangzhou Environmental Chemical Laboratory

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Test Sample:

Sample Description: Black liquid

A:

Sample as received are classified as below categories :

Description
Polymers : (i.e. PVC, PET, ABS , Rubber)
Metals : (i.e. Alloy, Stainless, Aluminium)
PCBA / Composite : (i.e. PCB, IC)
Non-Metal and Non-Polymers : (i.e. Textile, Paper, Leather, Wood)
Glass / Ceramic
Others : (i.e. Chemical Substance or Preparation, Desiccant, Carbon/Ink in Cartridge)

Remark:

1. Definition of classification is listed in **Appendix A** of this report in accordance with 67/548/EEC and Regulation (EC) No 1907/2006.

Test Method:

SGS In-House method- RSTS-EE-SVHC-002, Analyzed by ICP/AES, GC/MS and GC/ECD.

Remarks:

1. The chemical analysis of 15 SVHC is performed by means of currently available analytical techniques against the SVHC candidate list published by ECHA on 2008 October 28, and shall refer to http://echa.europa.eu/chem_data/candidate_list_table_en.asp. This list is under evaluation by ECHA and may subject to change in the future. Cyclododecane is not part of the SVHC candidate list at the time of the test.
2. In accordance with Regulation (EC) No 1907/2006, any producer or importer of articles shall notify ECHA, in accordance with paragraph 4 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation, if (a) the substance is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance is present in those articles above a concentration of **0.1%** weight by weight (w/w).
3. Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above **0.1%** weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance.
4. If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

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Test Result:

Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	ND	0.01	PBT
Anthracene	120-12-7	204-371-1	ND	0.005	PBT
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	ND	0.005	vPvB
Dibutyl phthalate (DBP)	84-74-2	201-557-4	ND	0.005	Toxic to Reproduction Category 2
4,4-Diaminodiphenylmethane (MDA)	101-77-9	202-974-4	ND	0.005	Carcinogen Category 2
Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	ND	0.005	Toxic to Reproduction Category 2
Bis (2-ethylhexylphthalate) (DEHP)	117-81-7	204-211-0	ND	0.005	Toxic to Reproduction Category 2
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β -HBCDD, γ -HBCDD)	25637-99-4 and 3194- 55-6 (134237-50-6, 134237-51-7, 134237-52-8)	247-148-4 and 221-695-9	ND	0.005	PBT
Bis(tributyltin)oxide*	56-35-9	200-268-0	ND	0.005	PBT
Cobalt dichloride*	7646-79-9	231-589-4	ND	0.005	Carcinogen Category 2
Diarsenic pentaoxide*	1303-28-2	215-116-9	ND	0.005	Carcinogen Category 1
Diarsenic trioxide*	1327-53-3	215-481-4	ND	0.005	Carcinogen Category 1
Triethyl arsenate*	15606-95-8	427-700-2	ND	0.005	Carcinogen Category 1
Lead hydrogen arsenate*	7784-40-9	232-064-2	ND	0.005	Carcinogen Category 1; Toxic to Reproduction Category 1
Sodium dichromate*	10588-01-9	234-190-3	ND	0.005	Carcinogen Category 2; Mutagen Category 2; Toxic to Reproduction Category 2

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Additional screening by client's request outside the scope of SVHC as published by ECHA on 2008 October 28:

Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Cyclododecane	294-62-2	206-033-9	ND	0.005	PBT

Remark:

1*. Calculated concentration of cobalt dichloride is based on the identified cobalt by ICP-AES and the identified chloride by IC method.

Calculated concentration of diarsenic pentoxide, diarsenic trioxide, lead hydrogen arsenate and triethyl arsenate are based on the identified heavy metal result (i.e. Arsenic, Lead)

Calculated concentrations of sodium dichromate are based on the identified sodium by ICP-AES and the identified chromium(VI) by spectroscopic method. The test result is reported as sodium dichromate (CAS number 10588-01-9). Please note that sodium dichromate dihydrate (CAS number 7789-12-0) is no longer classified as SVHC according to the latest amendment of 67/548/EEC (31th Adaption to Technical progress).

Calculated concentration of bis(tributyltin)oxide TBTO is based on the identified tin by ICP- AES and confirmed by TLC.

Identity of above metal substances present in the article has to be further confirmed.

Reporting Limit is evaluated for element (i.e. tin, cobalt, chloride, arsenic, lead, sodium, chromium (VI) respectively)

- 2. ND = Not detected (lower than Reporting Limit)
- 3. All Reporting Limit is based on homogenous material
- 4. The result(s) of sample is/are of the total weight of wet sample.

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B: RoHS Directive 2002/95/EC

Test Item(s)	Unit	Test Method (Reference)	Result	MDL	Limit
Cadmium (Cd)	mg/kg	IEC 62321: 2008(Section 8/9/10), ICP-OES	N.D.	2	100
Lead (Pb)	mg/kg	IEC 62321: 2008(Section 8/9/10), ICP-OES	4	2	1000
Mercury (Hg)	mg/kg	IEC 62321: 2008(Section 7), ICP-OES	N.D.	2	1000
Hexavalent Chromium (CrVI) by alkaline extraction	mg/kg	IEC 62321: 2008(Annex C), UV-Vis	N.D.	2	1000
Sum of PBBs	mg/kg	-	N.D.	-	1000
Monobromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Dibromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Tribromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Tetrabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Pentabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Hexabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Heptabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Octabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Nonabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Decabromobiphenyl	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Sum of PBDEs	mg/kg	-	N.D.	-	1000
Monobromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Dibromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Tribromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Tetrabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Pentabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Hexabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Heptabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Octabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Nonabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	
Decabromodiphenyl ether	mg/kg	IEC 62321: 2008(Annex A), GC-MS	N.D.	5	

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. "-" = Not regulated
5. The result(s) of sample is/are of the total weight of dry sample.

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C: PAHs (Polynuclear Aromatic Hydrocarbons)

Test Item(s)	Unit	Test Method	Results	MDL
Naphthalene	mg/kg	ZEK 01.2-08, GC-MS	3.0	0.2
Acenaphthylene	mg/kg	ZEK 01.2-08, GC-MS	3.8	0.2
Acenaphthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluorene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Phenanthrene	mg/kg	ZEK 01.2-08, GC-MS	2.3	0.2
Anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	7.5	0.2
Pyrene	mg/kg	ZEK 01.2-08, GC-MS	43.3	0.2
Benz(a)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Chrysene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(b)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(k)fluoranthene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(a)pyrene	mg/kg	ZEK 01.2-08, GC-MS	0.6	0.2
Indeno(1,2,3-cd)pyrene	mg/kg	ZEK 01.2-08, GC-MS	0.2	0.2
Dibenzo(a,h)anthracene	mg/kg	ZEK 01.2-08, GC-MS	N.D.	0.2
Benzo(g,h,i)perylene	mg/kg	ZEK 01.2-08, GC-MS	2.0	0.2
Sum of 16 PAHs acc. US EPA	mg/kg	-	62.7	-

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. The result(s) of sample is/are of the total weight of dry sample.

ZEK 01.2-08 : Restraining maximum values for products

Parameter	Category 1	Category 2	Category 3
	Material indented to be put in the mouth or material for toys with normal skin contact for children aged < 36 months	Materials those are not included in Category 1, with predictable contact with the skin longer than 30 s. (long-term skin contact).	Materials those are not included in Category 1 or 2, with predictable skin contact up to 30 s (short-term skin contact).
Benzo[a]pyrene (mg/kg)	<MDL (<0.2)***	1	20
Sum of 16 PAH (US EPA) (mg/kg)**	<MDL (<0.2)***	10	200

Remark:

**= Only PAH substances >0.2 mg/kg are taken into account while calculating the sum of PAHs

*** = In case that the maximum values exceed the limits of category 1, but are within the limits of category 2, one may confirm the suitability of the tested material which indented to be put in the mouth by additional specific migration tests of PAH components based on DIN EN 1186ff and §64 LFGB 80.30-1. The conclusion of the migration test results must be made based on food law criteria.

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D: PFOA & PFOS (Perfluorooctanoic acid & Perfluorooctane sulfonates)

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Perfluorooctanoic acid (PFOA)	mg/kg	EPA 3550C: 2007, LC-MS	N.D.	10
Perfluorooctane sulfonates (PFOS)				
PFOS – Acid	mg/kg	EPA 3550C: 2007, LC-MS	N.D.	10
PFOS – Metal Salt				
PFOS – Amide				

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. The result(s) of sample is/are of the total weight of wet sample.

For reference: Entry 53 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 (previously restricted under Directive 2006/122/EC):

- (1) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0,005 % by mass.
- (2) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0,1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg /m² of the coated material.

E: Halogen

Test Item(s)	Unit	Test Method (Reference)	Result	MDL
Fluorine (F)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Chlorine (Cl)	mg/kg	BS EN 14582:2007, IC	99	50
Bromine (Br)	mg/kg	BS EN 14582:2007, IC	N.D.	50
Iodine (I)	mg/kg	BS EN 14582:2007, IC	N.D.	50

Note:

1. mg/kg = ppm
2. N.D. = Not Detected (< MDL)
3. MDL = Method Detection Limit
4. The result(s) of sample is/are of the total weight of wet sample.

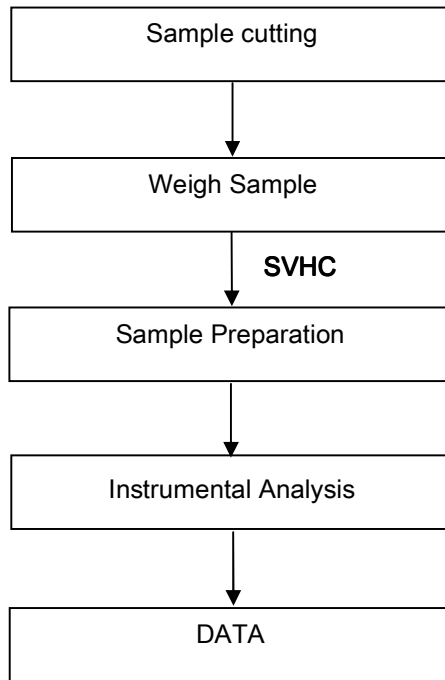
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Testing Flow Chart

- 1) Name of the person who made measurement: Bella Wang / Tina Zhao
- 2) Name of the person in charge of measurement: Adams Yu / Ryan Yang



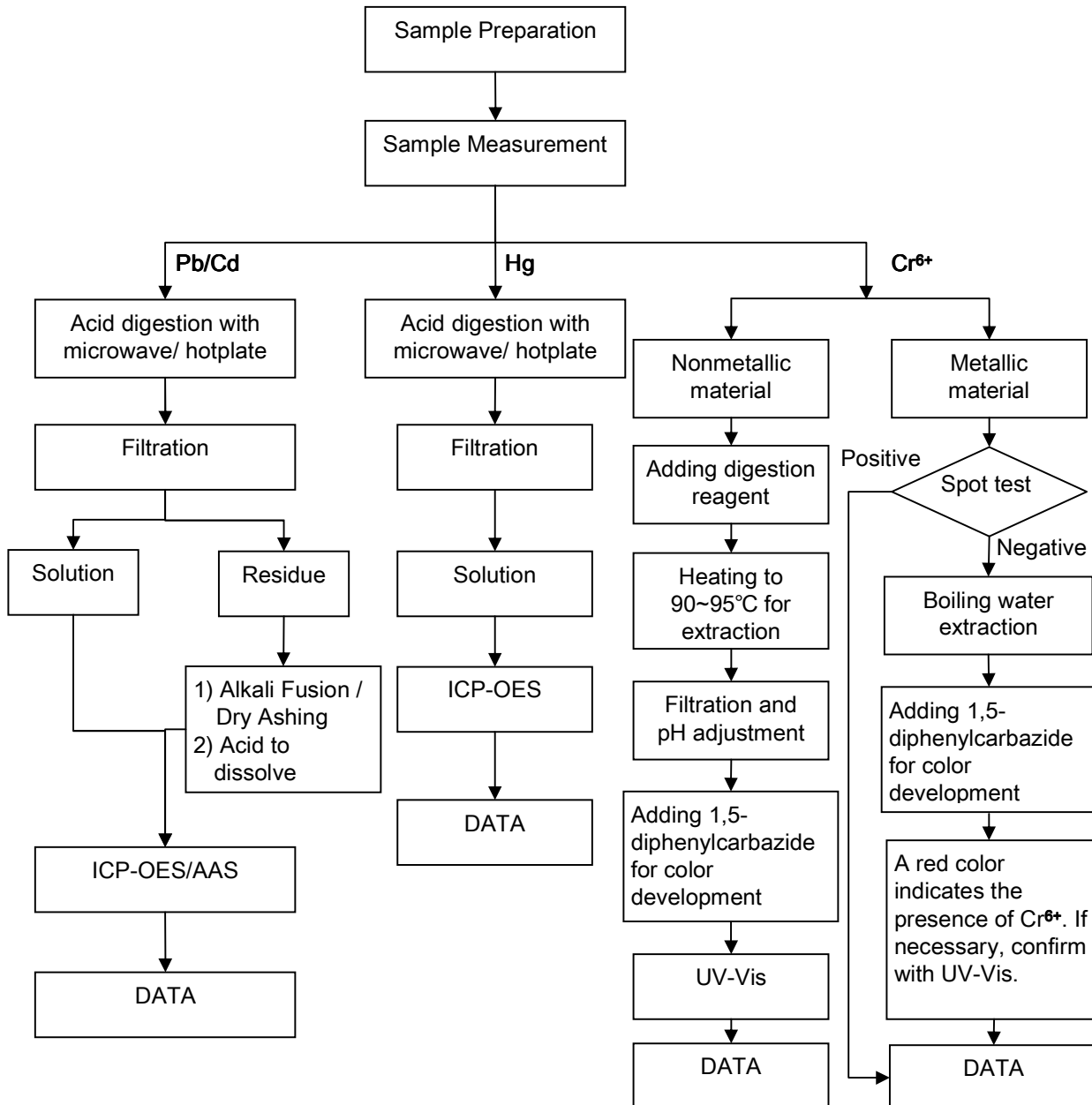
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Testing Flow Chart

- 1) Name of the person who made measurement: Bella Wang
- 2) Name of the person in charge of measurement: Adams Yu
- 3) These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr⁶⁺ test method excluded).

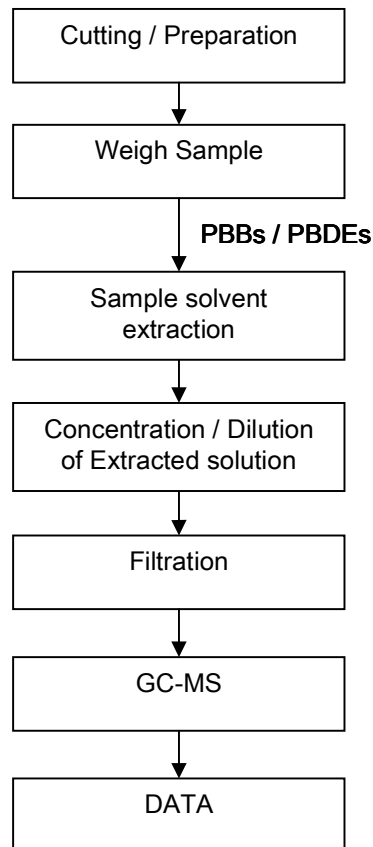


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Testing Flow Chart

- 1) Name of the person who made measurement: Tina Zhao
- 2) Name of the person in charge of measurement: Ryan Yang



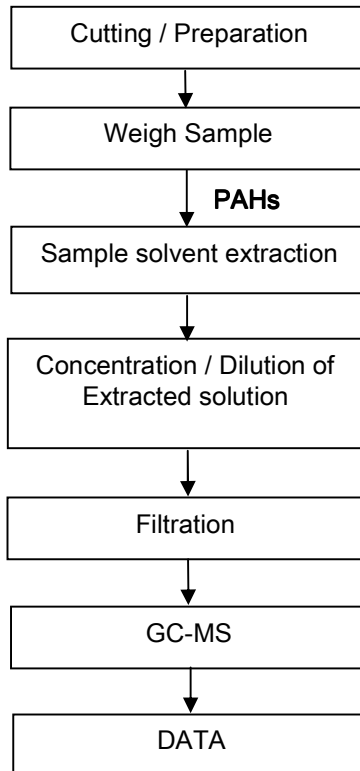
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Testing Flow Chart

- 1) Name of the person who made measurement: Cutey Yu
- 2) Name of the person in charge of measurement: Ryan Yang



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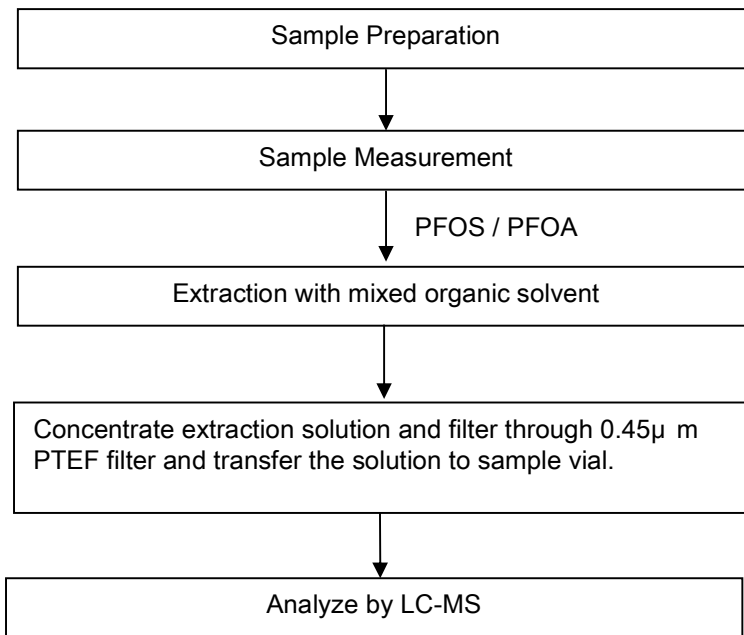
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Testing Flow Chart

- 1) Name of the person who made measurement: Cindy Huang
- 2) Name of the person in charge of measurement: Ryan Yang



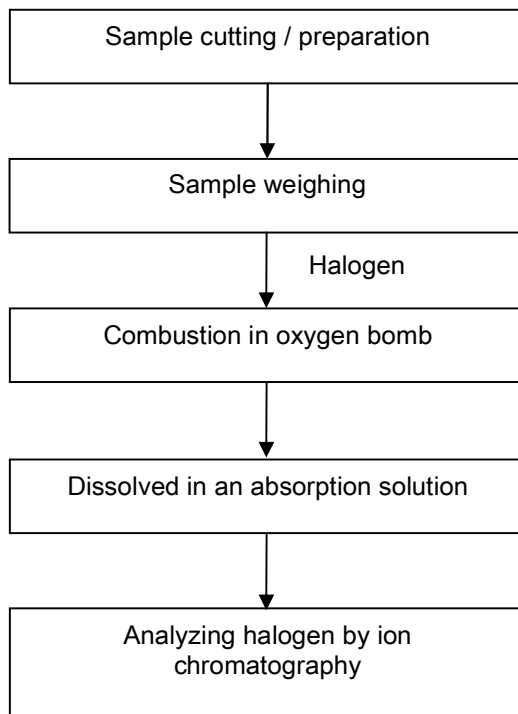
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ATTACHMENTS

Testing Flow Chart

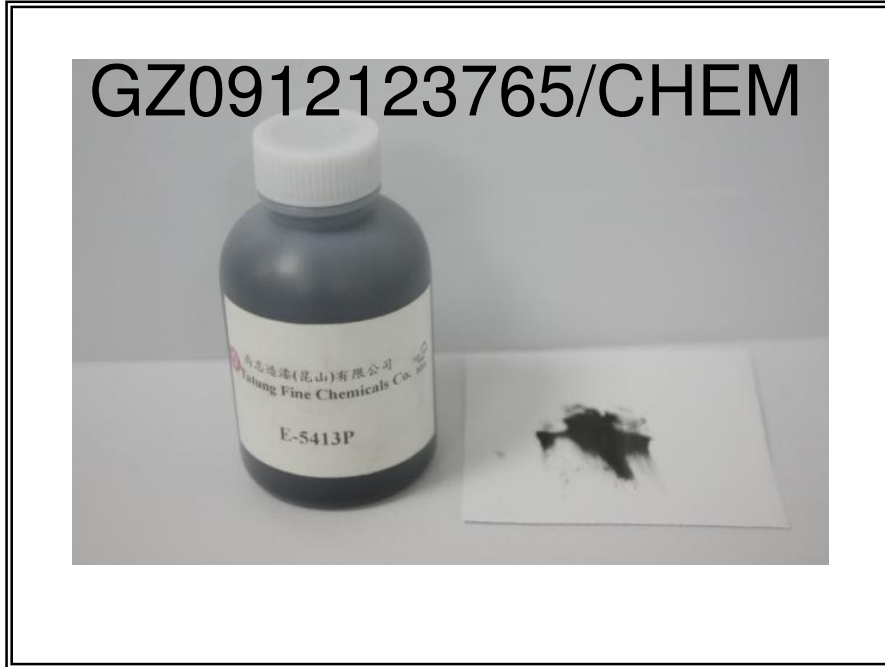
- 1) Name of the person who made measurement: Sawen Chen
- 2) Name of the person in charge of measurement: Michael Tso



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**Appendix A
Classification**

Definition under 67/548/EEC and Regulation (EC) No 1907/2006

- Carcinogen Category 1: Substances known to be carcinogenic to man. There is sufficient evidence to establish a causal association between human exposure to a substance and the development of cancer.
- Carcinogen Category 2: Substances which should be regarded as if they are carcinogenic to man. There is sufficient evidence to provide a strong presumption that human exposure to a substance may result in the development of cancer.
Generally on the basis of:
 - appropriate long-term animal studies
 - other relevant information.
- Mutagen Category 1: Substances known to be mutagenic to man. There is sufficient evidence to establish a causal association between human exposure to a substance and heritable genetic damage.
- Mutagen Category 2: Substances which should be regarded as if they are mutagenic to man. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in the development of heritable genetic damage, generally on the basis of:
 - appropriate animal studies,
 - other relevant information.
- Toxic to Reproduction Category 1: Substances known to impair fertility in humans. There is sufficient evidence to establish a causal relationship between human exposure to the substance and impaired fertility.
Substances known to cause developmental toxicity in humans. There is sufficient evidence to establish a causal relationship between human exposure to the substance and subsequent developmental toxic effects in the progeny.
- Toxic to Reproduction Category 2: Substances which should be regarded as if they impair fertility in humans. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in impaired fertility on the basis of:
 - clear evidence in animal studies of impaired fertility in the absence of toxic effects, or, evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary nonspecific consequence of the other toxic effects,
 - other relevant information.Substances which should be regarded as if they cause developmental toxicity to humans. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in developmental toxicity, generally on the basis of:
 - clear results in appropriate animal studies where effects have been observed in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of the other toxic effects,
 - other relevant information.
- PBT & vPvB: Substances which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) pose a particular challenge to the chemicals safety management. For these substances a “safe” concentration in the environment cannot be established with sufficient reliability.

*** End of Report ***

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