196, Aegibong-ro, Wolgot-myeon, Gimpo-si, Gyeonggi-do,
415-873 Rep. of KOREA
TEL 82-31-999-3000 FAX 82-31-999-3001

Report No. : TAK-000771
Receipt Date : Jan.24.2014

Customer : Chan Koo,Park except 1
KUMHO PETRO CHEMICAL CO.,LTD
227, Yeosusandan 2-ro, Yeosu-si, Jeollanam-do, Korea

Test Date : Feb.03.2014

Sample : Rubber Antioxidant [KUMANOX 13]

Testing Date : Jan.27.2014 ~ Feb.03.2014

Testing Environment : Temperature (20 ± 5) ℃, Relative humidity (40 ± 20) %

Test method : Refer to following pages

Test result : Refer to following pages

Attachment : Flow chart and Sample pictures

USAGE : QUALITY CONTROL

NOTE : 1. The test results on this test report are only limited to the samples and sample names provided by the customer and KTR do not guarantee the quality of all products of the customer.
2. This test report shall not be used for public relation, advertisement, lawsuit and any other purposes outside the scope of its defined usage.

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Reviewed by Kim Changseong
Technical Manager
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Feb.03.2014

Korea Testing & Research Institute

President Choi Hyeongki

전자문서본(Electronic Copy)

Report No : TAK-000771

Sample : Rubber Antioxidant [KUMANOX 13]

TEST RESULT

Test Items	Unit	Sample	Results	MDL	Test Methods
Pb	mg/kg	-	Not Detected	5	IEC 62321-5 Ed.1.0b : 2013 (AAS)
Cd	mg/kg	-	Not Detected	0.5	IEC 62321-5 Ed.1.0b : 2013 (AAS)
Hg	mg/kg	-	Not Detected	0.5	IEC 62321-4 Ed.1.0b : 2013 (AAS)
Cr(VI)	mg/kg	-	Not Detected	0.5	IEC 62321 Ed.1.0b : 2008 (UV/Vis)
Total-PBBs	mg/kg	-	Not Detected	-	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Mono-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Di-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tri-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tetra-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Penta-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hexa-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hepta-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Octa-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Nona-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Deca-BB	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Total-PBDEs	mg/kg	-	Not Detected	-	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Mono-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Di-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tri-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Tetra-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Penta-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hexa-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Hepta-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Octa-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Nona-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)
Deca-BDE	mg/kg	-	Not Detected	10	IEC 62321 Ed. 1.0 b : 2008 (GC/MS)

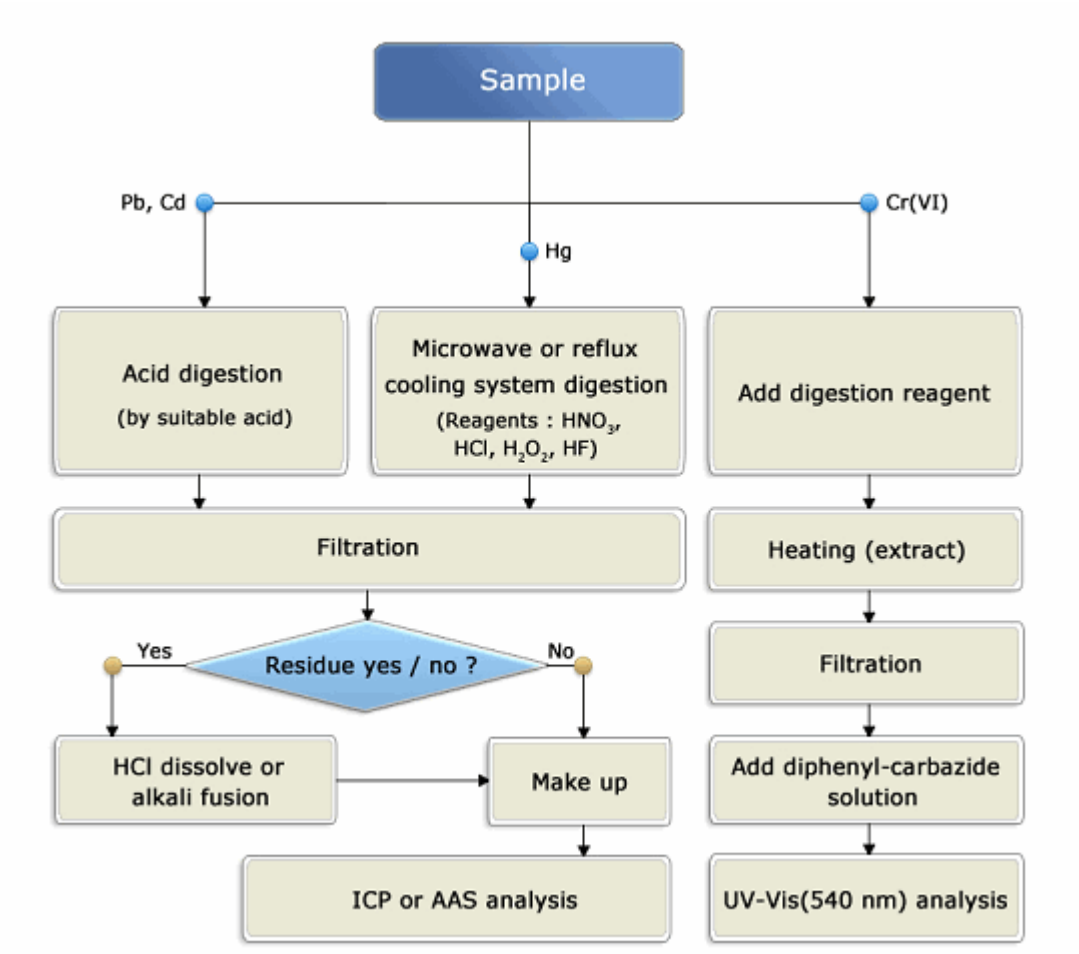
Notes : mg/kg = ppm (parts per million)
N.D. = Not detected (<MDL)
MDL = Method detection limit

Report No : TAK-000771

Sample : Rubber Antioxidant [KUMANOX 13]

Pb, Cd, Hg, Cr(Ⅵ) : Tested by Hong Chang-ki (Tel : 031-999-3114)

Flow chart of heavy metals analysis

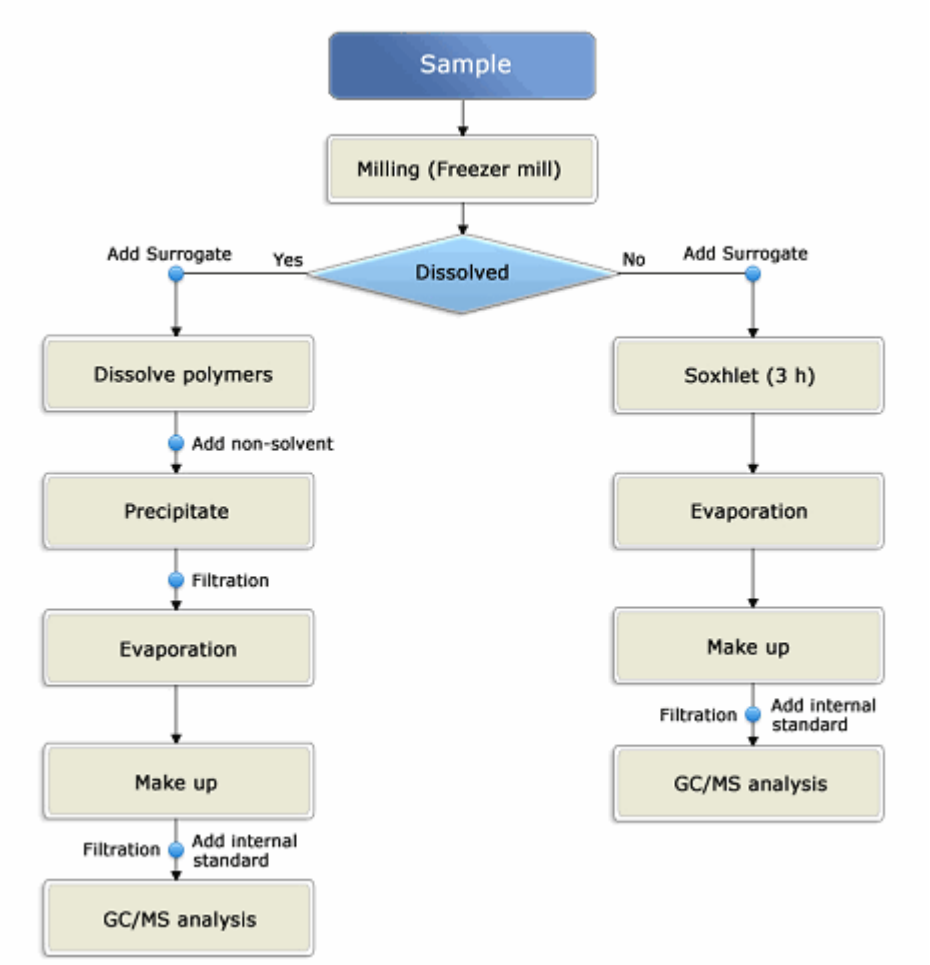


Report No : TAK-000771

Sample : Rubber Antioxidant [KUMANOX 13]

PBBs, PBDEs : Tested by Yoo Seungkyun (Tel : 031-999-3131)

Flow chart of PBBs and PBDEs analysis



Report No : TAK-000771

Sample : Rubber Antioxidant [KUMANOX 13]

Sample



- End of Report -