INTERNATIONAL MARITIME ORGANIZATION

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BLG WORKING GROUP ON THE
EVALUATION OF SAFETY AND
POLLUTION HAZARDS OF CHEMICALS
12th session
Agenda item 2

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EVALUATION OF NEW PRODUCTS

Alkyl benzene distillation bottoms (HAB)

Submitted by the European Chemical Industry Council (CEFIC)

SUMMARY

Executive summary:	Alkyl benzene distillation bottoms (HAB) is proposed for inclusion in Chapter 17 of the IBC Code
Action to be taken:	Paragraph 3.1
Related document:	BLG.1/Circ.20

1 Background

1.1 Alkyl benzene distillation bottoms (HAB) is proposed for inclusion in Chapter 17 of the IBC Code.

1.2 At its forty-third session, the GESAMP/EHS Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships considered the available data on the product Alkyl benzene distillation bottoms (HAB) provided by industry and the resultant hazard profile was shown in annex 4 of the document EHS 43/10, as attached to BLG.1/Circ.20.

1.3 The GESAMP Hazard Profile under the revised evaluation procedure is found hereunder:

A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3	Remarks
2	NR	0	(3)	0	0	1	1	1		NI	Fp	2	

2 Details of the proposal

2.1 Based on data provided by industry, it is proposed that Alkyl benzene distillation bottoms (HAB) be included in Chapter 17 of the revised IBC Code with the following carriage requirements:

Column		Entry
a.	Product name:	Alkyl benzene distillation bottoms (HAB)
c.	Pollution category:	Y
d.	Hazards:	P
e.	Ship type:	2
f.	Tank type:	2G
g.	Tank vents:	Open
h.	Tank environmental control:	No
i.	Electrical equipment:	
	i' Class	-
	i'' Group	-
	i''' Flash Point > 60°C	Yes
j.	Gauging:	O
k.	Vapour detection:	No
l.	Fire protection:	AB
n.	Emergency equipment:	No
o.	Specific and operational requirements:	15.19.6, 16.2.6

2.2 In addition Chapter 19 of the IBC Code containing the Index of Products Carried in Bulk should be updated to include associated synonyms for this product. A separate proposal dealing with synonyms for a broad range of products has been submitted (ESPH 12/6/1).

2.3 The data related to this product are set out at annex to this document.

3 Action requested of the Working Group

3.1 The Working Group is invited to consider the data associated with these products and assign carriage requirements as indicated in 2.1 and 2.2 above.

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ANNEX

BLG Product Data Reporting Form

(Characteristics of Products proposed for Bulk Marine Transport)

1: Product Identity

Product Name: Alkyl benzene distillation bottoms (HAB)

The product name shall be used in the shipping document for any cargo offered for bulk shipments. Any additional name may be included in brackets after the product name

1.1: Other Names and Identification Numbers

Main Trade Name	:
Main Chemical Name	: Alkyl benzene distillation bottoms (HAB)
Chemical Formula	:
C.A.S Number	: 68515-32-2; 68855-24-3; 84961-70-6; 85117-41-5; 151911-58-9; 129813-62-3; 68515-34-4; 94094-93-6
EHS Number	: **300**
BMR Number	:
RTECS Number	:

Structure

1.2: Associated Synonyms

Synonym Name	Type
Linear alkylbenzene (LAB) alkylate bottoms (USEPA/ICCA/OECD SIDS name)	
Heavy alkylate bottoms (HAB)	
Benzene, mono-C12-14 alkyl derivatives, fractionation bottoms	
Benzene, C14-30 alkyl derivatives	

Benzene, mono-C10-13, alkyl derivatives, distillation residues	
Benzene, mono-C10-14, alkyl derivatives, fractionation bottoms	
Benzene, mono-C12-13, branched alkyl derivatives, fractionation bottoms	
Benzene, mono-C10-13, alkyl derivatives, fractionation bottoms, light ends	
Benzene, mono-C12-14 alkyl derivatives, fractionation bottoms, heavy ends	
Benzene, mono-C10-13, alkyl derivatives, fractionation bottoms, heavy ends	
Alchisor® PT/R, Alchisor® PT, Alchisor® HD, Alchisor® HB/TEX, Alchisor® HB G, Alchisor® DE, Alchisor® 3SP	
Alkylate® H-230L	
Dealen® RD26	
Detalp® 360	
Petrene® 900	
Petrene® 990-Q / 900-Q	
Sasol V-159L®, Sasol V-154L®	
Venobos®	
Wibaryl® A, Wibaryl® B, Wibaryl® AB, Wibaryl® R, Wibaryl® F	

1.3: Composition

Component Name	%	Type
See Table 1 below		

Table 1. Range of Percentages for Alkylate Bottom Components

Component	CAS #	LAB, Dialkylbenzenes and Trialkylbenzenes	Diphenylalkanes**	Alkyltetralins and Indanes	Alkylnaphthalenes & other alkylated 2- or 3-ringed compounds ***
Whole Bottoms*	68515-32-2 68855-24-3 84961-70-6 85117-41-5 151911-58-9	45-99 % (LAB = 2-10%)	<0.1-40 %	<0.1-25 %	<0.001-26 %
Light Ends of Bottoms*	129813-62-3	55-65 % (LAB = 21%)	10-25 %	5-15 %	10-20 %
Heavy Ends of Bottoms*	68515-34-4 94094-93-6	40-90 % (LAB = 0%)	0-45 %	1-15 %	4-20 %

* Whole bottoms represent unfractionated alkylate bottoms derived from multiple companies' processes; the light and heavy end products are respectively the lower and higher boiling fractions of the whole bottoms from a single company's process. Because of this, light and heavy ends do not represent the extremes of composition. LAB = linear alkylbenzene (monoalkylbenzene); based on the increase in boiling point with increased molecular weight, the LABs present are predominately the higher molecular weight C_{13} and C_{14} LAB homologues.

** Based on the latest analytical data, higher values likely include a substantial proportion of trialkylbenzenes, which could not be distinguished by the analytical method used.

***Unalkylated naphthalene content is less than 50 ppb, the detection limit. No detectable levels of 1- and 9-methylphenanthrene, 1,4-dimethylphenanthrene, or 4,10-dimethylphenanthrene were found in recent analyses using GC-MS methodology on a typical sample derived from 50% Detal process and 50% HF/olefin process. In these analyses, the mass-chromatograms did not show the presence of any ion characteristic of these compounds in the region of the parent compound, phenanthrene. Since these compounds are not commercially available, the detection limit was assumed to be the same as phenanthrene, which was 1.9 ppm.

2: Physical Properties

Property	Units	Qual	Lower value	Upper value	Reference/ comments
Molecular weight			318	480	mean values
Density @ 20ºC	**(kg/m3)**		860	920	@ 15°C, IUCLID Alkylate bottoms 20 September 2005)
Flash Point (cc)	**(°C)**	>	160°C		IUCLID Alkylate bottoms (20 September 2005)
Boiling Point	**(°C)**		270	500	IUCLID Alkylate Bottoms (20 September 2005)
Melting Point/Pour Point	**(°C)**	<		-40	IUCLID Alkylate bottoms (20 September 2005)
Water solubility @ 20ºC	**(mg/l)**	<	0.004	0.041	@ 27°C, reliability rating: 1, IUCLID Alkylate bottoms 20 September 2005)
Viscosity @ 20ºC	**(mPa.s)**		30	480	cSt; IUCLID Alkylate bottoms 20 September 2005)
Vap. Press. @ 20ºC	**(Pa)**		0.00010	0.069	IUCLID Alkylate bottoms 20 September 2005)
AutoIgnitionTemp	**(°C)**		334	382	
Explosion Limits	**(% v/v)**				
Carriage Temperature	**(ºC)**		Ambient		
Unloading Temperature	**(ºC)**		Ambient		
MESG	**(mm)**				

3: Relevant Chemical Properties

Water Reactivity	**(0 - 2)**	0	Industry experience; absence of reactive groups
0=No Reactivity 1=Reactive 2=Highly	**Details**		

Does the product react with air to cause a potentially hazardous situation (Y/N)	**N**
If so, provide details	
Reference	

Is an Inhibitor or Stabilizer needed to prevent a hazardous reaction? (Y/N)	**N**
If so, provide details	
Reference	

Is refrigeration needed to prevent a hazardous reaction? (Y/N)	**N**
If so, provide details	
Reference	

4: Mammalian Toxicity

4.1 Acute Toxicity		**Qual**	**Lower Val.**	**Upper Val.**	**Species**	**Reference/Comments**
Oral LD50	**(mg/kg)**	=	1360		Rat	Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005)
		>	15800		Rat	Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005)

Dermal LD50	**(mg/kg)**		630	1000	Rabbit	Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005)
		>	7940		Rabbit	Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005)
		>	2010		Rabbit	Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)
		>	4300		Rat	Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)
		>	5000		Rat	Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)
Inhalation LC50	**(mg/l/4h)**	>.	36 for 1 hour		Rat	Reliability rating: 4, IUCLID Alkylate bottoms (20 September 2005) See other tox. data

4.2 Corrosivity and Irritation

Skin Corrosion time (hours)	24h exposure time.			

	Resultant observation	**Species**	**Reference/Comments**
Skin Irritation (4h exposure)	Slightly irritating for 4h exposure time.	Rabbit	Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)
	Mildly irritating for 24h exposure time.	Rabbit	Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005)

Eye Irritation	Slightly irritating Not irritating		Rabbit Rabbit		Reliability rating: 2, IUCLID Alkylate bottoms (20 September 2005) Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)

Not irritating, Slightly irritating, Mildly irritating, Moderately irritating, Severely irritating or Corrosive

4.3 Sensitization

Respiratory Sensitizer (in humans)	**(Y/N)**	**N**		No known effects - Industry experience; low vapor pressure, absence of reactive groups.
Skin Sensitization	**(Y/N)**	**N**		Reliability rating: 1, IUCLID Alkylate bottoms (20 September 2005)

4.4 Other Specific Long-Term Effects

Carcinogen	**(Y/N)**		No study available
Mutagen	**(Y/N)**	N	IUCLID Alkylate bottoms (20 September 2005), See also other toxicity
Toxic to Reproduction:	**(Y/N)**	N	See other toxicity
Other Long term	**(Y/N)**	N	See other toxicity

4.5 Other Relevant Mammalian Toxicity

5: GESAMP Hazard Profiles and Carriage Requirements

5.1: GESAMP Hazard Profiles

Column	Property	Value
A1	Bioaccumulation	2
A2	Biodegradation	NR
B1	Acute Aquatic Toxicity	0
B2	Chronic Aquatic Toxicity	(3)
C1	Acute Oral Toxicity	0
C2	Acute Dermal Toxicity	0
C3	Acute Inhalation Toxicity	1
D1	Skin Irritation/Corrosivity	1
D2	Eye Irritation/Corrosivity	1
D3	Specific Health Concerns	
E1	Tainting and Odour	NI
E2	Wildlife and Seabeds	Fp
E3	Beaches and Amenities	2
F	Remarks	

5.2: Proposed Carriage Requirements

Column in the IBC Code	Property	Value
c	Pollution Category	Y
d	Safety/Pollution Properties	P
e	Ship Type	2
f	Tank Type	2G
g	Tank Vents	Open
h	Tank Environmental Control	No
I’	Electrical Equipment - Class	-
I”	Electrical Equipment - Group	-

l”’	Electrical Equipment – Flashpoint > 60ºC	Yes
j	Gauging	O
k	Vapour Detection	No
l	Fire Protection	AB
n	Emergency Escape	No
o	Special Requirements	15.19.6, 16.2.6