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MICHAEL K. CARRIER EASTMAN CHEMICAL COMPANY 100 NORTH EASTMAN ROAD KINGSPORT, TN 37660-5075			REDDICK, MARIE L	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte EASTMAN CHEMICAL CO.
Inventors: William D. Arendt, Makarand Joshi,
Yvonne Aileen Berry-Walker, Paul Steven Lakomiak
and Mirnahini Jeganathan

Appeal 2012-001266
Application 11/949,378
Technology Center 1700

Before FRED E. McKELVEY, ROMULO H. DELMENDO and
DONNA M. PRAISS, *Administrative Patent Judges.*

McKELVEY, *Administrative Patent Judge.*

DECISION ON APPEAL

Statement of the case

1 Eastman Chemical Co. (“applicant”), the real party in interest (Brief,
2 page 1), seeks review under 35 U.S.C. § 134(a) of a final rejection dated
3 8 November 2010.

4 The application was filed in the USPTO on 3 December 2007.

5 The application has been published as U.S. Patent Application Publication
6 2009/0142981 A1.

7 In support of prior art rejections, the Examiner relies on the following
8 evidence.

Foster et al. “Foster”	U.S. Patent 5,534,575	09 July 1996
Ryan	U.S. Patent, 5,747,573	05 May 1998

9 Applicant does not contest the prior art status of the evidence relied upon by
10 the Examiner.

11 We mention the following additional evidence in this opinion, the patents
12 being mentioned in applicant’s Specification.

Arendt et al. “Arendt”	U.S. Patent 5,026,756	25 June 1991
Scarlett et al. “Scarlett”	U.S. Patent 5,395,986	07 Mar. 1995
Rathmell et al. “Rathmell”	U.S. Patent 5,395,987	07 Mar. 1995
Eastman	Safety Data Sheet (copyright by Eastman Chemical Company), SDSUS/EN/09 Version 2.0	14 Dec. 2011

1 We have jurisdiction under 35 U.S.C. § 134(a).

2 Claims on appeal

3 Claims 1-2, 7, 13-19 are on appeal. Brief, page 1; Answer, page 3.

4 Claim 1, which we reproduce from page 1 of the Claim Appendix of the
5 Brief, reads:

6 A composition comprising trans and cis isomers of
7 1,4-cyclohexane-dimethanol dibenzoate wherein the trans isomer
8 constitutes from 72 to 99 weight percent of said composition.

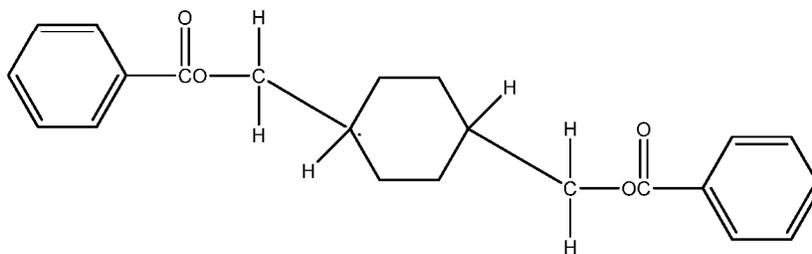
9 Applicant does not single out any claim for separate consideration.

10 Accordingly, we elect to decide the appeal on the basis of Claim 1. 37 C.F.R.
11 § 41.37(c)(1)(vii).

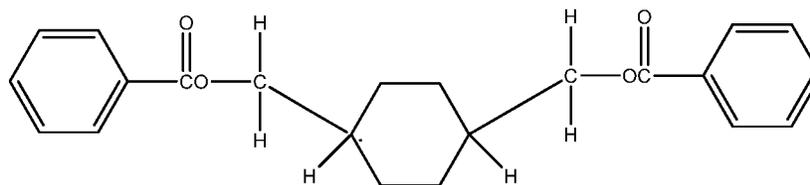
12 **Analysis**

13 Prima facie case

14 The dibenzoate of 1,4-cyclohexanedimethanol is a known compound. The
15 compound is also referred to in the record as (1) 1,4-cyclohexane dimethanol
16 dibenzoate (Ryan, col. 2:54-55) and (2) CHDMDB (Specification ¶ 0010). The
17 compound exists in two isomeric forms: a trans-isomer and a cis-isomer:



18
19 trans-CHDMDB



cis-CHDMDB

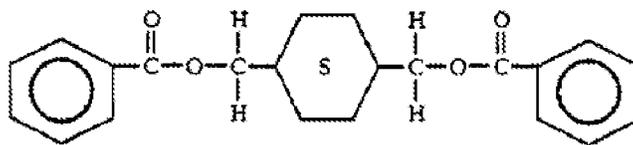
1
2
3 A commercial version of CHDMDB appears to have been sold as
4 Benzoflex® 352. Specification ¶¶ 0021, 0025 and 0037. According to applicant,
5 Benzoflex® 352 is a mixture of about 70% by weight of the trans-isomer and about
6 30% by weight of the cis-isomer. Specification ¶ 0037:1-2.

7 Ryan, relied upon by the Examiner, reveals that a CHDMDB product was
8 sold by Velsicol Chemical Corporation as early as 1995 under the name Benzoflex.
9 Col. 2:53-55. It appears that, as of 2011, applicant is a supplier of Benzoflex®
10 352. See Eastman. Ryan also reveals that Benzoflex® 352 is a plasticizer for use
11 in making hot melts.

12 Arendt, mentioned in the Specification (¶ 0010), names *inter alia* William
13 D. Arendt as an inventor—a named inventor in the application on appeal. Arendt,
14 assigned to Velsicol, describes the use of CHDMDB as a plasticizer in hot melt
15 adhesives. Col. 2:65 to col. 3:11.

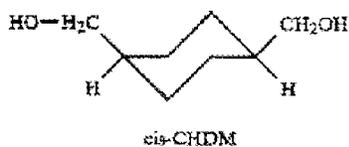
16 According to Arendt (col. 3:55-63):

17 1,4-cyclohexane dimethanol dibenzoate [CHDMDB] has the
18 following structure wherein the dimethanol dibenzoate groups can
19 be cis or trans and the cyclohexane ring can have either a chair of
20 [sic—or] boat configuration:



1 A “DSC” [Differential Scanning Calorimeter] trace of some form of
2 CHDMDB appears in Arendt Fig. 1. No numerical values are set out for either H
3 on the Arendt y-axis or temperature on the Arendt x-axis. Thus, we cannot
4 compare Arendt’s DSC trace vis-à-vis applicant’s DSD Fig. 1 trace, which
5 applicant characterizes as a DCS trace of commercially available CHDMDB
6 (Benzoflex® 352) (Specification ¶0021).

7 1,4-cyclohexane dimethanol (CHDM) is a known compound. *See* Scarlett
8 and Rathmell, both owned by applicant and mentioned in the Specification
9 (¶ 0006) of the application on appeal. CHDM when reacted with benzoic acid
10 produces CHDMDB. Ryan, col. 2:24-51. CHDM has two isomeric forms, trans-
11 and cis-:



12

1 *See, e.g.*, Scarlett, col. 1:55-50. Scarlett and Rathmell reveal that those
2 skilled in the art are aware of methods¹ of making 1,4-cyclohexane dimethanol
3 (CHDM) having trans-isomer to cis-isomer ratios varying from (1) about 1 : 1
4 [a racemic mixture] to (2) 3.84 : 1. Rathmell, col. 12:27-33; col. 14:12-18
5 (trans-isomer to cis-isomer ratio of about 2:1 up to about 3.84 : 1); Scarlett,
6 col. 6:62 to 79 (trans-isomer to cis-isomer ratio of about 2 : 1 up to about 3.84 : 1).

7 The prior art teaches one skilled in the art that:

8 (1) CHDM within applicant's claimed trans-isomer ratio is
9 known (Scarlett and Rathmell),

10 (2) CHDMDB is made by reacting CHDM with benzoic acid
11 (Ryan),

12 (3) CHDMDB is a known plasticizer in hot melt adhesives
13 (Foster, Ryan and Arendt), and

14 (4) hot melts made using CHDMDB as a plasticizer results

15 (a) in faster hot melt set times without adversely affecting
16 open times (Arendt, col. 3:44-48) and

17 (b) high heat resistance and high elevated peel values
18 (Ryan, col. 4:32-33).

19 Foster, Ryan and Arendt do not require any particular trans-isomer to
20 cis-isomer ratio. In view of the prior art as discussed above, we agree with the
21 Examiner that it would have been obvious to use a CHDMDB having, *inter alia*, a
22 trans-isomer content of 72 to 99 weight percent. Applicant has used CHDMDB

¹ The method described by Scarlett and Rathmell appears to be different from the method of applicant's withdrawn from prosecution method claims.

1 made from CHDM having trans-isomer contents within the scope of Claim 1 as a
2 plasticizer for hot melt adhesives.

3 Applicant's arguments

4 *Rationale 1*

5 We note the following observation which appears on page 5:14-16 of the
6 Brief:

7 "it is only . . . [applicant's] [S]pecification which teaches that
8 Benzoflex contains about 70 weight percent of the trans isomer of
9 CHDM dibenzoate"

10 What the Specification reveals is CHDMDB is said to be made by
11 reacting benzoic acid and one of the commercially available forms of
12 1,4-cyclohexanedimethanol. "[O]ne such [commercial] product" is said to contain
13 about 70 weight percent of the trans-isomer and about 30 weight percent of the
14 cis-isomer. The resultant benzoate ester is said to be commercially available as
15 Benzoflex® 352. Specification ¶ 0025. Applicant appears to be a supplier of
16 Benzoflex® 352. *See Eastman*, which states that Benzoflex® 352 is a mixture of
17 the cis-1,4-isomer and the trans-1,4-isomer, but does not identify the trans-isomer
18 content. Applicant has not favored the USPTO with any information as to whether
19 other "such product[s]" have a different trans-isomer content.

20 To the extent that applicant maintains that the prior art does not reveal the
21 trans-isomer to cis-isomer ratio of Benzoflex® 352, then applicant is in a very poor
22 position to maintain that Benzoflex® 352 is not a CHDMDB within the scope of
23 Claim 1. No underlying basis is given in the Specification for applicant's
24 unsubstantiated assertion that Benzoflex® 352 has a trans-isomer content of about

1 70 weight percent. Insofar as we can tell, no experimental analysis revealed in the
2 record supports applicant's stated trans-isomer content of Benzoflex® 352. Since
3 the underlying basis for applicant's observation does not appear in the record, one
4 alternative theory for affirming the Examiner is based on our declining to credit the
5 factual accuracy of the observation.

6 In any event, applicant's observation is curious. As a supplier of CHDMDB,
7 applicant should be in a position to advise the USPTO whether the trans-isomer
8 content of Benzoflex® 352 is known in the art. Since the art suggests that the
9 trans-isomer content can be within the trans-isomer content claimed, we hold that
10 the subject matter would have been obvious even if one skilled would not have
11 been aware of the specific trans-isomer content of Benzoflex® 352. If the trans-
12 isomer content of Benzoflex® 352 is not about 70 weight percent, then it becomes
13 manifest that applicant's comparative data in the Specification may not be based
14 on a comparison of the closest prior art. Under this alternative, we would have no
15 cogent reason to credit the comparison.

16 *Rationale 2*

17 There is a second alternative rationale for affirming the Examiner's
18 rejection. Rationale 2 assumes that those skilled in the art know that Benzoflex®
19 352 has a trans-isomer content of about 70%.

20 If so, the difference between either Foster or Ryan and the subject matter of
21 Claim 1 is that neither Foster nor Ryan explicitly describes a trans-isomer content
22 of 72 to 99 weight percent. The same can be said for Arendt. Applicant maintains
23 that the prior art does not teach or suggest the claimed trans-isomer content. Brief,
24 page 4:15-19; Reply Brief, page 3:18-20. Stated in other terms, applicant

1 maintains that nothing in the art reaches raising or lowering the 70% trans-isomer
2 content of Benzoflex® 352. Brief, page 5:3-5; Reply Brief, page 3:25-27. Foster,
3 Ryan and Arendt do not limit the CHDMDB described to any particular trans-
4 isomer content. Moreover, as noted earlier, those skilled in the art know how to
5 make CHDM having trans-isomer contents within the scope of Claim 1. One
6 skilled in the art would have expected CHDMDB made from CHDM having
7 essentially any trans-isomer content mentioned by Scarlett and Rathmell to
8 function as a plasticizer for hot melts given Arendt’s teaching that CHDMDB has a
9 trans-isomer or cis-isomer configuration.

10 Applicant maintains on the basis of experimental data reported in the
11 Specification that the invention of Claim 1 produces an unexpected result. Brief,
12 page 6:1-18. The Examiner declined to credit the data in the Specification,
13 because “the claims are simply not limited to where the improvement is shown.”
14 Answer, page 9, 2d full ¶. We have no basis for disagreeing with the Examiner.

15 Three different trans-isomer/cis-isomer CHDMDB materials are described
16 as being tested. According to applicant, the trans-isomer/cis-isomer weight ratio of
17 the three materials is as follows (Specification ¶ 0048):

Designation of CHDMDB	Trans-isomer to cis-isomer ratio	Other
Control	70 : 30	Commercial mixture identified as prior art Benzoflex® 352
XP 7007	92 : 8	Within scope of Claim 1
XP7008	1 : 1	Racemic mixture within scope of Claims 7 and 13-19, but not Claim 1

18

1 We need not decide whether any result obtained with XP 7007 or XP 7008 is
2 unexpected. The data simply is not commensurate in scope with the breadth of the
3 claimed trans-isomer to cis-isomer ratios. *In re Harris*, 409 F.3d 1339, 1344 (Fed.
4 Cir. 2005) (“[T]he record does not show that the improved performance would
5 result if the weight-percentages were varied within the claimed ranges. Even
6 assuming that the results were unexpected, Harris needed to show results covering
7 the scope of the claimed range.”). We are unable to find on this record that the
8 crystallization times (Specification ¶¶ 0049), melt viscosity, average open times,
9 average set times, adhesion and adhesion failure temperature (Specification
10 ¶¶ 0065 to 0069) yield similar results throughout the claimed range of trans-
11 isomer. As noted by the Examiner, a prior art 70 weight percent trans-isomer is
12 “close enough” to 72—the lower weight percent range of Claim 1. Answer,
13 page 9:11-12. Applicant has not established by clear and convincing evidence that
14 it achieves an unexpected result throughout its claimed range. *In re Heyna*, 360
15 F.2d 222, 228 (CCPA 1966) (“It was incumbent upon appellants to submit clear
16 and convincing evidence to support their allegation of unexpected . . . property.”).
17 *See also McClain v. Ortmyer*, 141 U.S. 419, 429 (1891) (conclusive evidence
18 needed to establish new function). We also observe that the claims are not limited
19 to any specific value of any particular property. Even if applicant’s particular tests
20 show an unexpected result, then the claims arguably would cover both obvious and
21 non-obvious subject—and therefore would be unpatentable. *In re Muchmore*, 433
22 F.2d 824, 826 (CCPA 1970) (claims which include obvious subject matter and
23 non-obvious subject matter are not patentable under § 103)

1 **Other arguments**

2 We have considered applicant's remaining arguments and find none that
3 warrant reversal of the Examiner's rejections. *Cf. In re Antor Media Corp.*,
4 689 F.3d 1282, 1294 (Fed. Cir. 2012).

5 **Decision**

6 Upon consideration of the appeal, and for the reasons given herein, it is
7 **ORDERED** that the decision of the Examiner rejecting the claims on
8 appeal over the prior art is *affirmed*.

9 **FURTHER ORDERED** that since we have cited additional prior art
10 (albeit art known to applicant) and rationale that differs from the rationale of the
11 Examiner, our affirmance is designated as a new rejection. 37 C.F.R. § 41.50(b).

12 **FURTHER ORDERED** that our decision is not a final agency
13 action.

14 **FURTHER ORDERED** that within **two (2) months** from the date of
15 our decision, appellant may further prosecute the application on appeal by
16 exercising one of the two following options:

17 Option 1: Request that prosecution be reopened by submitting
18 an amendment or evidence or both. 37 C.F.R. § 41.50(b)(1).

19 Option 2: Request rehearing on the record presently before the
20 Board. 37 C.F.R. § 41.50(b)(2).

21 **FURTHER ORDERED** that no time period for taking any
22 subsequent action in connection with this appeal may be extended under 37 C.F.R.
23 § 1.136(a)(1)(iv).

24 **AFFIRMED**

Appeal 2012-001266
Application 11/949,378

1
2 bar
3

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Benzoflex(TM) 352 Plasticizer

Product No.: EAN 985109. 32610-00, P3261000, P3261001, P3261005, P3261006, P3261008, P3261007, P3261004, P3261009, P3261002, P3261003, P3261010

Additional identification

Chemical name: 1,4-cyclohexane dimethanol dibenzoate
CAS-No.: 35541-81-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Plasticizer
Uses advised against: None known.

1.3 Details of the supplier of the safety data sheet

Manufacturer / Supplier

Eastman Chemical Company
 200 South Wilcox Drive
 Kingsport, TN 37660-5280 US
 +14232292000

Visit our website at www.EASTMAN.com or email emnmstds@eastman.com

1.4 Emergency telephone number:

For emergency health, safety, and environmental information, call 1-423-229-4511 or 1-423-229-2000.

For emergency transportation information, in the United States: call CHEMTREC at 800-424-9300 or call 423-229-2000.

SECTION 2: Hazards identification

LOW HAZARD FOR USUAL INDUSTRIAL OR COMMERCIAL HANDLING BY TRAINED PERSONNEL

SECTION 3: Composition/information on ingredients

3.1 / 3.2 Substances / Mixtures

General information:

Chemical name	Concentration	Additional identification	Notes
A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate	98 - 100%	CAS-No.: 35541-81-2 EC No.: 416-230-3 INDEX No.: 607-444-00-X	

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
This substance has workplace exposure limit(s).
PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

SECTION 4: First aid measures**4.1 Description of first aid measures**

Inhalation: Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Eye contact: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if symptoms persist.

Skin contact: Wash with soap and water. Get medical attention if symptoms occur.

Ingestion: Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed: No data available.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: None known.

Treatment: Treat symptomatically.

SECTION 5: Firefighting measures

General fire hazards: Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.

5.1 Extinguishing media

Suitable extinguishing media: Water spray. Dry chemical. Carbon Dioxide.

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture:

Powdered material may form explosive dust-air mixtures.

5.3 Advice for firefighters

Special Fire Fighting Procedures: Minimize dust generation and accumulation.

Special protective equipment for fire-fighters: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: Accidental release measures

- 6.1 Personal precautions, protective equipment and emergency procedures:** Wear appropriate personal protective equipment.
- 6.2 Environmental precautions:** Avoid release to the environment.
- 6.3 Methods and material for containment and cleaning up:** Sweep up and place in a clearly labeled container for chemical waste.
- Notification Procedures:** In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SECTION 7: Handling and storage:

- 7.1 Precautions for safe handling:** No special precautions are necessary beyond normal good hygiene practices. See Section 8 of the MSDS for additional personal protection advice when handling this product. Practice good housekeeping.
- 7.2 Conditions for safe storage, including any incompatibilities:** Keep container closed.
- 7.3 Specific end use(s):** Plasticizer

SECTION 8: Exposure controls/personal protection**8.1 Control parameters****Occupational exposure limits**

If exposure limits have not been established, maintain airborne levels to an acceptable level.

8.2 Exposure controls**Appropriate engineering controls:**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

General information: Eye bath. Washing facilities.

Eye/face protection: It is a good industrial hygiene practice to minimize eye contact.

Skin protection	
Hand protection:	It is a good industrial hygiene practice to minimize skin contact.
Other:	No data available.
Respiratory Protection:	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.
Hygiene measures:	Observe good industrial hygiene practices.
Environmental Controls:	No data available.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical State:	Solid
Form:	Solid
Color:	White
Odor:	Slight
Odor Threshold:	Not determined.
pH:	No data available.
Melting Point	118 °C
Boiling Point:	No data available.
Flash Point:	258 °C (open cup)
Evaporation Rate:	Not determined.
Flammability (solid, gas):	No data available.
Flammability Limit - Upper (%)-:	No data available.
Flammability Limit - Lower (%)-:	No data available.
Vapor pressure:	Not determined.
Vapor density (air=1):	> 1
Specific Gravity:	1.1363
Solubility(ies)	
Solubility in Water:	Practically Insoluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Autoignition Temperature:	> 450 °C
Decomposition Temperature:	Thermal stability not tested. Low stability hazard expected at normal operating temperatures.
Viscosity:	Not determined.

Explosive properties: No data available.
Oxidizing properties: No data available.

SECTION 10: Stability and reactivity

10.1 Reactivity: None known.
10.2 Chemical stability: Stable
10.3 Possibility of hazardous reactions: None known.
10.4 Conditions to avoid: None at ambient temperatures.
10.5 Incompatible materials: Strong oxidizing agents.
10.6 Hazardous decomposition products: Carbon Dioxide. Carbon Monoxide.

SECTION 11: Toxicological information**Information on likely routes of exposure**

Inhalation: None known.
Ingestion: None known.
Skin contact: None known.
Eye contact: None known.

11.1 Information on toxicological effects**Acute Toxicity****Oral**

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
Oral LD-50: (Rat): > 5,000 mg/kg

Dermal

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
Dermal LD-50: (Rabbit): > 2,000 mg/kg

Inhalation

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

Repeated dose toxicity

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

Skin corrosion/irritation:

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

(Rabbit)none

Serious eye damage/eye irritation:

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

(Rabbit): none

Respiratory or skin sensitization:

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

Skin Sensitization:, (Guinea Pig) - none

Germ cell mutagenicity**In vitro****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**In vivo****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Carcinogenicity****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Reproductive toxicity****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Specific target organ toxicity - single exposure****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Specific target organ toxicity - repeated exposure****Product:** No data available.**Specified substance(s)**

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

Aspiration hazard

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

Other adverse effects: No data available.

SECTION 12: Ecological information**12.1 Toxicity****Acute toxicity****Fish**

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

LC-50 (Rainbow Trout, 96 h): > 0.8 - 100 mg/l

Aquatic invertebrates

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

LC-50 (Water Flea, 48 h): > 0.0014 - 100 mg/l

Chronic Toxicity**Fish**

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

Aquatic invertebrates**Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Toxicity to Aquatic Plants****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
EC-50 (Alga, 72 h): > 0.012 mg/l**12.2 Persistence and degradability****Biodegradation****Product:** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Biological Oxygen Demand:****Product** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**Chemical Oxygen Demand:****Product** No data available.**Specified substance(s)**A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate
No data available.**BOD/COD ratio****Product** No data available.**Specified substance(s)**

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

12.3 Bioaccumulative potential

Product: No data available.

Specified substance(s)

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

12.4 Mobility in soil: No data available.

Known or predicted distribution to environmental compartments

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

12.5 Results of PBT and vPvB assessment: No data available.

A mixture of: cis-1,4-dimethylcyclohexyl dibenzoate; trans-1,4-dimethylcyclohexyl dibenzoate

No data available.

12.6 Other adverse effects: No data available.

SECTION 13: Disposal considerations**13.1 Waste treatment methods**

General information: No data available.

Disposal Methods: Dispose of waste and residues in accordance with local authority requirements. Incinerate.

SECTION 14: Transport information

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

DOT

Class not regulated

IMDG - International Maritime Dangerous Goods Code
Class not regulated

IATA
Class not regulated

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS (Canada) Status: noncontrolled

US EPCRA (SARA Title III) Section 313 - Toxic Chemical List

NONE

OSHA: nonhazardous

TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL. Any impurities present in this product are exempt from listing.

AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.

ECL (Korean Toxic Substances Control Act): This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.

Inventory of Existing Chemical Substances in China: All components of this product are listed on the Inventory of Existing Chemical Substances in China (IECSC).

SECTION 16: Other information

HMIS® Hazard Ratings: Health - 1, Flammability - 1, Chemical Reactivity - 0

HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

Revision Information: Not relevant.

Key literature references and sources for data: No data available.

Training information: No data available.

Issue Date: 12/14/2011

SDS No:

Disclaimer: This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.