Cod Liver Oil Reference Material

Name:	Cod Liver Oil Reference Material
Catalog number:	EDF-5463
Lot number:	I1-12578B
Date Created:	March 14, 2011
Expiration Date:	May 26, 2020 (unopened bottle only)
Amount per Ampoule:	10 g
Storage and Handling:	EDF-5463 contains trace amounts of dioxin, furans, PCBs, BFRs, PAHs, and pesticides. It should be handled according to OSHA guidelines for hazardous material. Store in the dark at 4°C.
Intended Use:	For laboratory use only. This product is a sample of homogeneous Cod Liver Oil matrix. This sample is intended for use in evaluating the performance of an analytical laboratory for the listed analytes.
Preparation:	EDF-5463 is a Cod Liver Oil Material purchased from TestAmerica Corporation in Knoxville, TN. The pure Norwegian cod liver oil is commercially available. This sample is meant to be used to evaluate the performance of an analytical laboratory for the analytes given.
Interlaboratory Analyis:	EDF-5463 was analyzed in an International Interlaboratory Study conducted by Cambridge Isotope Laboratories. Participating laboratories used a variety of sample preparation and analytical techniques.
Interlaboratory results:	Results of the international interlaboratory study are attached. Consensus values were independently assigned by TRIUM Inc. (Canada) using statistical analysis software. These numbers are certified reference values. All values are presented at three significant figures. Analytes with fewer than five laboratories contributing acceptable data do not have assigned values reported in this study.

Authorized Signature: Thomas Dorsey **3/15/2011**

Quality Assurance Date

Participating Laboratories

AgriQuality Limited - Wellington Laboratory, New Zealand

Biodetection Systems, The Netherlands

California Department of Fish & Game, USA

Columbia Analytical Services, USA

Ehime University, Japan

Food GmbH Jena, Germany

Health Canada, Canada

IDEA Consultants, Inc., Japan

Institut National de Santé Publique du Québec, Canada

Münster Analytical Solutions GmbH, Germany

National Measurement Institute, Australia

Ontario Ministry of Environment, Canada

State Institute for Chemical and Veterinary Analysis of Food, Germany

Taiwan Agricultural Chemicals and Toxic Substances Research Institute (TACTRI,COA), Taiwan

Vista Analytical, USA

(all values in ng/kg)

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated Dioxins and furans				
2,3,7,8-TetraCDD	ND[4]	N/A	N/A	10
2,3,7,8-TetraCDF	ND	N/A	N/A	10
1,2,3,7,8-PentaCDD	ND	N/A	N/A	10
1,2,3,7,8-PentaCDF	ND	N/A	N/A	10
2,3,4,7,8-PentaCDF	ND	N/A	N/A	10
1,2,3,4,7,8-HexaCDD	ND	N/A	N/A	10
1,2,3,6,7,8-HexaCDD	ND	N/A	N/A	10
1,2,3,7,8,9-HexaCDD	ND	N/A	N/A	10
1,2,3,4,7,8-HexaCDF	ND	N/A	N/A	10
1,2,3,6,7,8-HexaCDF	ND	N/A	N/A	10
1,2,3,7,8,9-HexaCDF	ND	N/A	N/A	10
2,3,4,6,7,8-HexaCDF	ND	N/A	N/A	10
1,2,3,4,6,7,8-HeptaCDD	ND	N/A	N/A	10
1,2,3,4,6,7,8-HeptaCDF	ND	N/A	N/A	9
1,2,3,4,7,8,9-HeptaCDF	ND	N/A	N/A	9
OctaCDD	ND	N/A	N/A	10
OctaCDF	ND	N/A	N/A	9

(all values in ng/kg)

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated biphenyls[4]				
2,4,4'-TriCB (#28)	50.4	11.6	50.4 ± 23.2	6
2,2',3,5'-TetraCB (#44)	60.7	10.7	60.7 ± 21.4	5
2,2',5,5'-TetraCB (#52)	153	36.2	153 ± 72.4	8

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated biphenyls[4] *(continued)*				
2,3',4,4'-TetraCB (#66)	171	21.5	171 ± 43.0	5
2,4,4',5-TetraCB (#74)	102	17.3	102 ± 34.6	6
3,3',4,4'-TetraCB (#77)	9.61	1.87	9.61 ± 3.74	8
2,2',4,4',5-PentaCB (#99)	474	59.0	474 ± 118	8
2,2',4,5,5'-PentaCB (#101)	661	97.4	661 ± 195	8
2,3,3',4,4'-PentaCB (#105)	732	69.5	732 ± 139	11
2,3,3',4',6-PentaCB (#110)	567	89.7	567 ± 179	9
2,3,4,4',5-PentaCB (#114)	34.5	7.74	34.5 ± 15.5	10
2,3',4,4',5-PentaCB (#118)	1590	148	1590 ± 296	11
2',3,4,4',5-PentaCB (#123)	22.8	7.15	22.8 ± 14.3	9
3,3',4,4',5-PentaCB (#126)	15.2	4.13	15.2 ± 8.26	10
2,2',3,3',4,4'-HexaCB (#128)	767	223	767 ± 446	9
2,2',3,4,4',5-HexaCB (#137)	134	17.7	134 ± 35.4	5
2,2',3,4,4',5'-HexaCB (#138)	3800	638	3800 ± 1280	10
2,2',3,4,5,5'-HexaCB (#141)	253	34.4	253 ± 68.8	6
2,2',3,4',5',6-HexaCB (#149)	762	237	762 ± 474	7
2,2',3,5,5',6-HexaCB (#151)	235	73.0	235 ± 146	7
2,2',4,4',5,5'-HexaCB (#153)	3890	450	3890 ± 900	11
2,3,3',4,4',5-HexaCB (#156)	456	69.2	456 ± 138	12
2,3,3',4,4',5'-HexaCB (#157)	124	11.6	124 ± 23.2	10
2,3,3',4,4',6-HexaCB (#158)	272	36.7	272 ± 73.4	5

(all values in ng/kg)

Analyte	Assigned Value[1]	Standard Deviation	Reference Value[2]	(n)[3]
Polychlorinated biphenyls[4] *(continued)*				
2,3',4,4',5,5'-HexaCB (#167)	234	26.5	234 ± 53.0	10
3,3',4,4',5,5'-HexaCB (#169)	4.39	0.579	4.39 ± 1.16	7
2,2',3,3',4,4',5-HeptaCB (#170)	917	85.9	917 ± 172	10
2,2',3,3',4',5,6-HeptaCB (#177)	217	25.5	217 ± 51.0	7
2,2',3,3',5,5',6-HeptaCB (#178)	151	19.2	151 ± 38.4	6
2,2',3,4,4',5,5'-HeptaCB (#180)	2160	182	2160 ± 364	11
2,2',3,4,4',5',6-HeptaCB (#183)	341	38.1	341 ± 76.2	9
2,2',3,4',5,5',6-HeptaCB (#187)	839	105	839 ± 210	9
2,3,3',4,4',5,5'-HeptaCB (#189)	53.4	7.25	53.4 ± 14.5	11
2,2',3,3',4,4',5,5'-OctaCB (#194)	296	32.9	296 ± 65.8	7
2,2',3,3',4,4',5,5',6-NonaCB (#206)	95.1	18.1	95.1 ± 36.2	7
2,2',3,3',4,5,5',6,6'-NonaCB (#208)	28.1	6.46	28.1 ± 12.9	5
DecaCB (#209)	96.2	12.8	96.2 ± 25.6	6
Brominated Diphenyl ethers[4]				
2,2',4-TriBDE (#17)	7.21	1.09	7.21 ± 2.18	6
2,4,4'-TriBDE (#28)	39.7	5.28	39.7 ± 10.6	6
2,2',4,4'-TetraBDE (#47)	1490	237	1490 ± 474	9
2,3',4,4'-TetraBDE (#66)	52.6	17.5	52.6 ± 35.0	6
2,2',4,4',5-PentaBDE (#99)	187	24.3	187 ± 48.6	7
2,2',4,4',6-PentaBDE (#100)	359	31.6	359 ± 63.2	7
2,2',4,4',5,5'-HexaBDE (#153)	33.9	5.09	33.9 ± 10.2	7
2,2',4,4',5,6'-HexaBDE (#154)	238	29.6	238 ± 59.2	

[1] Assigned value as determined by TRIUM Inc. (Canada) using STATISTICA data analysis software analysis of raw interlaboratory study data.

[2] Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.

[3] Number of laboratories providing results for this analyte.

[4] Consensus values could not be assigned for these congeners as nine out of ten participating laboratories reported values below the limits of detection for their laboratory (typically 0.01 ng/kg to 1.0 ng/kg).

[5] All numbers in parentheses refer to the IUPAC designation for the compound.

CIL

CAMBRIDGE ISOTOPE LABORATORIES
50 Frontage Road, Andover, Massachusetts 01810

Material Safety Data Sheet

PLEASE NOTE: This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally unavailable, but are assumed to be similar or identical to the corresponding unlabeled compound. While the information contained is believed to be accurate, it does not claim to be all inclusive, and should be used only as a guide. CIL, Inc., extends no warranties with respect hereto and disclaims all liabilities from reliance thereon. Judgments as to the suitability of the data presented with respect to the use of the product are the responsibility of the purchaser and intended user.

Section 1. Chemical Product and Company Identification

Cod Liver Oil Reference

CATALOG NO.
EDF-5463

Manufacturer's Name
Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA.

Emergency Telephone No.
USA: 1-800-424-9300
USA, for Information:
(800) 322-1174

Emergency Telephone No.
INT: 1-202-483-7616
International, for Information:
(978) 749-8000

Date Prepared: 14-Apr-11

Supersedes: All previous.

Section 2. Hazard. Ingredients/Identity Information

RTECS No.: Not available.

Hazardous Components (Specific Chemical Identity; Common Names)

Chemical Names	CAS Number	OSHA PEL	ACGIH TLV
Cod Liver Oil Reference Material	8001-69-2 (Unlabeled)	Not established.	Not established.

See page 3 for list of components.

Section 3. Hazard Identification.

Appearance:	Liquid.
Potential health effects:	Not available.
Routes of Entry:	Inhalation, ingestion, skin absorption.
Symptoms of exposure:	Inflammation of eye is characterized by redness, watering, and itching.
Target organs:	Not available.
Warnings:	Very hazardous if eye contact. Hazardous by skin contact or inhalation.

Section 4. First Aid Measures.

On contact, flush eyes with lots of water for at least 15 minutes.
On contact, wash skin with soap and lots of water.
If inhaled, remove to fresh air.
Wash contaminated clothing before reuse.

Breathing: If breathing is difficult, give oxygen.
Not breathing: If not breathing, give artificial respiration.
Swallowed: Give victim large quantities of liquid.

Section 5. Fire-Fighting Measures.

Extinguishing Media:	Use extinguishing media appropriate to surrounding fire conditions. May be combustible at high temperatures.
Methods and cautions:	Wear self-contained breathing apparatus and protective clothing. Prevent contact with skin and eyes. Emits toxic fumes under fire conditions.

Flammable LEL: Not available. Flammable UEL: Not available.

Section 6. Accidental Release Measures.

Absorb on sand or vermiculite and place in closed containers for disposal.
Ventilate area and wash spill site after material pickup is complete.
Dissolve or mix the material with a combustible solvent.

Hygiene warning:	Wash thoroughly after handling.
Respiratory protection:	Wear appropriate NIOSH/MSHA approved respirator.

Section 7. Handling and Storage.

General warning:	Very hazardous if eye contact. Hazardous by skin contact or inhalation.
Handling procedures:	Avoid contact with eyes, skin and clothing.
Storage procedures:	Store at room temperature away from light and moisture.
Hygiene instructions:	Wash thoroughly after handling.
Other:	Not available.

Section 8. Exposure Controls and Personal Protection.

General controls:	Mechanical exhaust required.
Eye/face protection:	Chemical safety goggles.
Skin Protection:	Wear suitable protective clothing.
Respiratory protection:	Wear appropriate NIOSH/MSHA approved respirator.

Section 9. Physical/Chemical Characteristics.

Molecular weight:	NA	Autoignition temperature:	Not available.
Appearance:	Liquid.	Flash point/Method:	Closed cup: 215 °C (419 °F)
Odor:	Fish. (Strong.)	Melting point:	-5 °C (23 °F)
Physical state:	Liquid.	Boiling point:	Not available.
pH:	Not available.	Freezing point:	Not available.
Vapor pressure:	Not available.		
Vapor density:	Not available.		
Solubility in water:	Insoluble in cold water.		
Specific gravity/density:	0.91		

Section 10. Stability and Reactivity.

Chemical Stability:	See storage and expiration date.
Conditions to Avoid:	Heat and sources of ignition.
Incompatibilities:	Not available.
Hazardous Decomposition:	Not available.
Hazardous Polymerization:	No.

Section 11. Toxicological Information (see Section 3 on first page).

Acute data:	PCBs have been listed in the IARC Group 2A and the NTP 7th Annual report on carcinogens. May be harmful by inhalation, ingestion, or skin absorption. Vapor or mist is irritating to eyes, mucous membranes, and upper respiratory tract. Causes skin irritation.
Chronic data:	Consistent animal studies indicate that PCBs produce liver injury following prolonged and repeated exposure by any route. See page 3 for quantity of components present.

Section 12. Ecological Information (impact if released into environment).
Not available.

Section 13. Disposal Considerations.
Waste material should be disposed of under conditions that meet Federal, State and Local regulations.

Section 14. Transport Information.
Follow all Federal, State, and Local transportation guidelines.

Section 15. Regulatory Information.
Not available.

Section 16. Other Information.
Not available.

Section 2. Hazard. Ingredients/Identitiy Identification

Hazardous Components (Specific Chemical Identity; Common Names)

Chemical Names	Unlabeled CAS #	Total Quantity	OSHA PEL	ACGIH TLV
2-MONOCB (PCB-1)	2051-60-7	<0.000001%	Not established.	Not established.
4-MONOCB (PCB-3)	2051-62-9	<0.000001%	Not established.	Not established.
2,2'-DICB (PCB-4)	13029-08-8	<0.000001%	Not established.	Not established.
2,4'-DICB (PCB-8)	34883-43-7	<0.000001%	Not established.	Not established.
2,5-DICB (PCB-9)	34883-39-1	<0.000001%	Not established.	Not established.
2,6-DICB (PCB-10)	33146-45-1	<0.000001%	Not established.	Not established.
3,3'-DICB (PCB-11)	2050-67-1	<0.000001%	Not established.	Not established.
3,4'-DICB (PCB-13)	2974-90-5	<0.000001%	Not established.	Not established.
4,4'-DICB (PCB-15)	2050-68-2	<0.000001%	Not established.	Not established.
2,2',5-TRICB (PCB-18)	37680-65-2	<0.000001%	Not established.	Not established.
2,3,4'-TRICB (PCB-22)	38444-85-8	<0.000001%	Not established.	Not established.
2,4,4'-TRICB (PCB-28)	7012-37-5	<0.000001%	Not established.	Not established.
2,4,6-TRICB (PCB-30)	35693-92-6	<0.000001%	Not established.	Not established.
2,4',5-TRICB (PCB-31)	16606-02-3	<0.000001%	Not established.	Not established.
2',3,4-TRICB (PCB-33)	38444-86-9	<0.000001%	Not established.	Not established.
3,3',4-TRICB (PCB-35)	37680-69-6	<0.000001%	Not established.	Not established.
3,4,4'-TRICB (PCB-37)	38444-90-5	<0.000001%	Not established.	Not established.
2,2',3,5'-TETRACB (PCB-44)	41464-40-8	<0.000001%	Not established.	Not established.
2,2',4,5'-TETRACB (PCB-49)	41464-40-8	<0.000001%	Not established.	Not established.
2,2',5,5'-TETRACB (PCB-52)	35693-99-3	<0.000001%	Not established.	Not established.
2,3',4,4'-TETRACB (PCB-66)	32598-10-0	<0.000001%	Not established.	Not established.
2,4,4',5-TETRACB (PCB-74)	32690-93-0	<0.000001%	Not established.	Not established.
3,3',4,4'-TETRACB (PCB-77)	32598-13-3	<0.000001%	Not established.	Not established.
3,4,4',5-TETRACB (PCB-81)	70362-50-4	<0.000001%	Not established.	Not established.
2,2',4,4',5-PENTACB (PCB-99)	38380-01-7	<0.000001%	Not established.	Not established.
2,2',4,5,5'-PENTACB (PCB-101)	37680-73-2	<0.000001%	Not established.	Not established.
2,3,3',4,4'-PENTACB (PCB-105)	32598-14-4	<0.000001%	Not established.	Not established.
2,3,3',4',6-PENTACB (PCB-110)	38380-03-9	<0.000001%	Not established.	Not established.
2,3,4,4',5-PENTACB (PCB-114)	74472-37-0	<0.000001%	Not established.	Not established.
2,3',4,4',5-PENTACB (PCB-118)	31508-00-6	<0.000001%	Not established.	Not established.
2',3,4,4',5-PENTACB (PCB-123)	65510-44-3	<0.000001%	Not established.	Not established.
3,3',4,4',5-PENTACB (PCB-126)	57465-28-8	<0.000001%	Not established.	Not established.
2,2',3,3',4,4'-HEXACB (PCB-128)	38380-07-3	<0.000001%	Not established.	Not established.

Section 2. Hazard. Ingredients/Identitiy Identification
Hazardous Components (Specific Chemical Identity; Common Names)

Chemical Names	Unlabeled CAS #	Total Quantity	OSHA PEL	ACGIH TLV
2,2',3,4,4',5-HEXACB (PCB-137)	35694-06-5	<0.000001%	Not established.	Not established.
2,2',3,4,4',5'-HEXACB (PCB-138)	35065-28-2	<0.000001%	Not established.	Not established.
2,2',3,4,5,5'-HEXACB (PCB-141)	52712-04-6	<0.000001%	Not established.	Not established.
2,2',3,4',5',6-HEXACB (PCB-149)	38380-04-0	<0.000001%	Not established.	Not established.
2,2',3,5,5',6-HEXACB (PCB-151)	52663-63-5	<0.000001%	Not established.	Not established.
2,2',4,4',5,5'-HEXACB (PCB-153)	35065-27-1	<0.000001%	Not established.	Not established.
2,3,3',4,4',5-HEXACB (PCB-156)	38380-08-4	<0.000001%	Not established.	Not established.
2,3,3',4,4',5'-HEXACB (PCB-157)	69782-90-7	<0.000001%	Not established.	Not established.
2,3,3',4,4',6-HEXACB (PCB-158)	74472-42-7	<0.000001%	Not established.	Not established.
2,3',4,4',5,5'-HEXACB (PCB-167)	52663-72-6	<0.000001%	Not established.	Not established.
3,3',4,4',5,5'-HEXACB (PCB-169)	32774-16-6	<0.000001%	Not established.	Not established.
2,2',3,3',4,4',5-HEPTACB (PCB-170)	35065-30-6	<0.000001%	Not established.	Not established.
2,2',3,3',4',5,6-HEPTACB (PCB-177)	52663-70-4	<0.000001%	Not established.	Not established.
2,2',3,3',5,5',6-HEPTACB (PCB-178)	52663-67-9	<0.000001%	Not established.	Not established.
2,2',3,4,4',5,5'-HEPTACB (PCB-180)	35065-29-3	<0.000001%	Not established.	Not established.
2,2',3,4,4',5',6-HEPTACB (PCB-183)	52663-69-1	<0.000001%	Not established.	Not established.
2,2',3,4',5,5',6-HEPTACB (PCB-187)	52663-68-0	<0.000001%	Not established.	Not established.
2,3,3',4,4',5,5'-HEPTACB (PCB-189)	39635-31-9	<0.000001%	Not established.	Not established.
2,2',3,3',4,4',5,5'-OCTACB (PCB-194)	35694-08-7	<0.000001%	Not established.	Not established.
2,2',3,3',4,4',5,5',6-NONACB (PCB-206)	40186-72-9	<0.000001%	Not established.	Not established.
2,2',3,3',4,5,5',6,6'-NONACB (PCB-208)	52663-77-1	<0.000001%	Not established.	Not established.
DECACHLOROBIPHENYL (PCB-209)	2051-24-3	<0.000001%	Not established.	Not established.
2,2',4-TRIBDE (BDE-17)	147217-75-2	<0.000001%	Not established.	Not established.
2,4,4'-TRIBDE (BDE-28)	41318-75-6	<0.000001%	Not established.	Not established.
2,2',4,4'-TETRABDE (BDE-47)	5436-43-1	<0.000001%	Not established.	Not established.
2,3',4,4'-TETRABDE (BDE-66)	189084-61-5	<0.000001%	Not established.	Not established.
2,2',4,4',5-PENTABDE (BDE-99)	60348-60-9	<0.000001%	Not established.	Not established.
2,2',4,4',6-PENTABDE (BDE-100)	189084-61-5	<0.000001%	Not established.	Not established.
2,2',4,4',5,5'-HEXABDE (BDE-153)	68631-49-2	<0.000001%	Not established.	Not established.
2,2',4,4',5,6'-HEXABDE (BDE-154)	207122-15-4	<0.000001%	Not established.	Not established.