

SCREENING-LEVEL HAZARD CHARACTERIZATION
Fatty Nitrogen-Derived Amphoteric Category

SUBCATEGORY I: ACYL AMINO PROPANAMINIUM AMPHOTERIC

SPONSORED CHEMICALS

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts	CASRN 61789-39-7
1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine)	CASRN 61789-40-0

SUBCATEGORY II: ALKYL AMINIUM AMPHOTERIC

SPONSORED CHEMICAL

1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt	CASRN 693-33-4
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The High Production Volume (HPV) Challenge Program¹ was conceived as a voluntary initiative aimed at developing and making publicly available screening-level health and environmental effects information on chemicals manufactured in or imported into the United States in quantities greater than one million pounds per year. In the Challenge Program, producers and importers of HPV chemicals voluntarily sponsored chemicals; sponsorship entailed the identification and initial assessment of the adequacy of existing toxicity data/information, conducting new testing if adequate data did not exist, and making both new and existing data and information available to the public. Each complete data submission contains data on 18 internationally agreed to “SIDS” (Screening Information Data Set^{1,2}) endpoints that are screening-level indicators of potential hazards (toxicity) for humans or the environment.

The Environmental Protection Agency’s Office of Pollution Prevention and Toxics (OPPT) is evaluating the data submitted in the HPV Challenge Program on approximately 1400 sponsored chemicals by developing hazard characterizations (HCs). These HCs consist of an evaluation of the quality and completeness of the data set provided in the Challenge Program submissions. They are not intended to be definitive statements regarding the possibility of unreasonable risk of injury to health or the environment.

The evaluation is performed according to established EPA guidance^{2,3} and is based primarily on hazard data provided by sponsors; however, in preparing the hazard characterization, EPA considered its own comments and public comments on the original submission as well as the sponsor’s responses to comments and revisions made to the submission. In order to determine whether any new hazard information was developed since the time of the HPV submission, a search of the following databases was made from one year prior to the date of the HPV Challenge submission to the present: (ChemID to locate available data sources including

¹ U.S. EPA. High Production Volume (HPV) Challenge Program; <http://www.epa.gov/chemrtk/index.htm>.

² U.S. EPA. HPV Challenge Program – Information Sources; <http://www.epa.gov/chemrtk/pubs/general/guidocs.htm>.

³ U.S. EPA. Risk Assessment Guidelines; <http://cfpub.epa.gov/ncea/raf/rafguid.cfm>.

Medline/PubMed, Toxline, HSDB, IRIS, NTP, ATSDR, IARC, EXTOXNET, EPA SRS, etc.), STN/CAS online databases (Registry file for locators, ChemAbs for toxicology data, RTECS, Merck, etc.) and Science Direct. OPPT's focus on these specific sources is based on their being of high quality, highly relevant to hazard characterization, and publicly available.

OPPT does not develop HCs for those HPV chemicals which have already been assessed internationally through the HPV program of the Organization for Economic Cooperation and Development (OECD) and for which Screening Initial Data Set (SIDS) Initial Assessment Reports (SIAR) and SIDS Initial Assessment Profiles (SIAP) are available. These documents are presented in an international forum that involves review and endorsement by governmental authorities around the world. OPPT is an active participant in these meetings and accepts these documents as reliable screening-level hazard assessments.

These hazard characterizations are technical documents intended to inform subsequent decisions and actions by OPPT. Accordingly, the documents are not written with the goal of informing the general public. However, they do provide a vehicle for public access to a concise assessment of the raw technical data on HPV chemicals and provide information previously not readily available to the public.

<p>Chemical Abstract Service Registry Number (CASRN)</p>	<p>Subcategory I</p> <p><u>Sponsored Chemicals</u></p> <p>61789-39-7 61789-40-0</p> <p><u>Supporting Chemicals</u></p> <p>4292-10-8 70851-07-9</p> <p>Subcategory II</p> <p><u>Sponsored Chemical</u></p> <p>693-33-4</p>
<p>Chemical Abstract Index Name</p>	<p>Subcategory I</p> <p><u>Sponsored Chemicals</u></p> <p>1-Propanaminium, 3-amino-N-(carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts</p> <p>1-Propanaminium, 3-amino-N-(carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, inner salts</p> <p><u>Supporting Chemicals</u></p> <p>1-Propanaminium, N-(carboxymethyl)- N,N-dimethyl-3-[(1-oxododecyl)amino]-, inner salt</p> <p>Alkylation products of N-[3-(dimethylamino)propyl] coco amides with chloroacetic acid sodium salts</p> <p>Subcategory II</p> <p><u>Sponsored Chemical</u></p> <p>1-Hexadecanaminium, N-(carboxymethyl)- N,N-dimethyl-, inner salt</p>
<p>Structural Formula</p>	<p>See Section 1</p>

Summary

The fatty nitrogen derived (FND) amphoteric category contains 3 solid substances that are split into 2 subcategories: acyl amino propanaminium amphoteric and alkyl aminium amphoteric. The acyl amino propanaminium amphoteric and the alkyl aminium amphoteric are dispersible in water and have negligible vapor pressure. Mobility in soil is expected to be moderate. Volatilization is considered negligible. The rate of hydrolysis is considered negligible. The rate of atmospheric photooxidation is considered moderate; however, this is not an important environmental fate pathway since these substances will not exist in the vapor phase in the atmosphere. The substances in the fatty nitrogen derived (FND) amides amphoteric (Category III) are expected to have low persistence (P1) and low bioaccumulation potential (B1).

Human Health Hazard

Subcategory I: Acyl Amino Propanaminium Amphoteric

The acute toxicity of CASRN 61789-40-0 is low in rats by the oral and dermal routes. A 28-day oral gavage repeated-dose toxicity study in rats showed forestomach irritation in males and females at 1000 mg/kg-day (highest dose tested); the NOAEL is 500 mg/kg-day. A 92-day oral gavage repeated-dose toxicity study in rats showed forestomach gastritis in males and females at 500 mg/kg-day and above; the NOAEL is 250 mg/kg-day. No reproductive toxicity studies were available. However, the 92-day oral gavage study in rats showed no adverse treatment-related effects on reproductive organs. In a prenatal developmental toxicity study in rats administered CASRN 61789-40-0 via gavage, reduced maternal body weights and stomach ulcers were observed at 286 mg/kg-day; the NOAEL for maternal toxicity is 95 mg/kg-day. Signs of developmental toxicity consisted of increased numbers of resorptions, decreased number of viable fetuses and decreased fetal body weight at 950 mg/kg-day; the NOAEL for developmental toxicity is 286 mg/kg-day. CASRN 61789-40-0 was not mutagenic in bacteria *in vitro*. Adequate studies were not identified for chromosomal aberrations. CASRN 61789-40-0 is irritating to rabbit skin and eyes and is a skin sensitizer in mice based on the local lymph node assay.

Chromosomal aberration testing is identified as a data gap for Subcategory I under the HPV Challenge Program.

Subcategory II: Alkyl Aminium Amphoteric

The acute toxicity of CASRN 693-33-4 is low in rats by the oral and dermal routes. There were no repeated-dose toxicity studies and no reproductive toxicity studies available. In a prenatal developmental toxicity study in rats administered CASRN 693-33-4 via gavage, decreased body weight gain was observed at 50 mg/kg-day (the lowest dose tested) and above; a NOAEL for maternal toxicity was not established. Reduced or absent ossification of the skull was observed at 250 mg/kg-day; the NOAEL for developmental toxicity is 150 mg/kg-day. In a dermal pilot developmental toxicity study in rabbits, decreased body weight gain and clinical signs were observed in dams treated with 10 mg/kg-day (the lowest dose tested) and above; a NOAEL for

maternal toxicity was not established. Increased resorptions were observed starting at 40 mg/kg-day; the NOAEL for developmental toxicity is 20 mg/kg-day. No gene mutation and no chromosomal aberration studies were available. No irritation or sensitization studies were available.

Repeated-dose and reproductive toxicity, gene mutations and chromosomal aberration testing and irritation and sensitization are identified as data gaps for Subcategory II under the HPV Challenge Program.

Hazard to the Environment

The 96-hour fish LC₅₀ values for CASRNs 61789-39-7, 61789-40-0, and 693-33-4 are 0.23, 2.0, and <0.23 mg/L, respectively. The 48-hour aquatic invertebrate EC₅₀ values for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 1.9, 1.9, and 2.5 mg/L, respectively. The 96-hour aquatic plant EC₅₀ values for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.55, 0.55, and <0.55 mg/L, respectively. The aquatic invertebrate chronic LOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 3.6, 3.6, and <3.6 mg/L, respectively. The aquatic invertebrate chronic NOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.9, 0.9, and <0.9 mg/L, respectively. The fish chronic LOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.5, 0.5, and <0.5 mg/L. The fish chronic NOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.16, 0.16 and <0.16mg/L.

No data gaps were identified for aquatic toxicity under the HPV Challenge Program.

The sponsor, The American Chemistry Council's Fatty Nitrogen Derivatives Panel Amides Task Group, submitted a Test Plan and Robust Summaries to EPA for fatty nitrogen-derived amphetics on October 8, 2004. EPA posted the submission on the ChemRTK HPV Challenge website on October 18, 2004

(<http://www.epa.gov/chemrtk/pubs/summaries/fantdrad/c13319tc.htm>). The submission is one of five revisions in response to EPA comments dated June 27, 2002 on the original fatty nitrogen-derived amides submission, dated December 19, 2001.

Category Justification

The fatty nitrogen-derived (FND) amphetics were submitted as category (III) in the larger FND amides category submission. All of the substances in the proposed category are based on an alkyl N-(carboxy-methyl)-N,N-dimethylammonium structure, commonly referred to as betaine. The proposed category consists of three sponsored substances and two supporting chemicals. The sponsor supported the grouping of the three sponsored chemicals and two supporting chemicals in this category based on their surfactant properties and common structural features. The sponsor also stated that the surfactant properties of the sponsored and supporting chemicals will result in similarities in the toxicological properties of these substances; therefore, the read-across approach was proposed using data provided for one or more substances for an endpoint to support the rest of the substances in the category.

EPA agrees that two of the sponsored chemicals, CASRN 61789-39-7 (1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts) and CASRN 61789-40-0 (1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine)), and the two proposed supporting substances are very similar in structure and that grouping these amide-containing compounds into a category is supported by their structural similarities. However, the third sponsored substance, CASRN 693-33-4 (1-hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt), does not contain an amide group and is expected to be somewhat more hydrophobic than the other proposed category members.

Although few data are provided in the robust summaries, EPA agrees that the grouping of all the sponsored chemicals and supporting chemicals into a single category is generally supported for the aquatic toxicity endpoints. However, insufficient data were provided to support the grouping of all the proposed category members based on health effects. CASRN 61789-439-7 (1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts and CASRN 61789-40-0 (1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine)) can be reasonably expected to have similar mammalian toxicities based on their structural similarities. It is not possible, based on the information available, to determine if the structural difference of CASRN 693-33-4 (1-hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt) is of toxicological significance. Further comparisons between the toxicity of this sponsored chemical and the other chemicals in the proposed category cannot be made without further data. Therefore, the grouping of CASRN 693-33-4 (1-hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt) with the other substances in the proposed category is not supported without further data. As a result, two subcategories have been created for the evaluation of human health effects

endpoints. Subcategory I, acyl amino propanaminium amphoteric, is comprised of the two sponsored chemicals, CASRN 61789-39-7 (1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts) and CASRN 61789-40-0 (1-propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine)), and the two supporting chemicals CASRN 4292-10-8 and CASRN 70851-07-9. Subcategory II, alkyl aminium amphoteric, is comprised of the sponsored chemical CASRN 693-33-4 (1-hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt). For human health effects endpoints, a read-across strategy is supported among members of Subcategory I, but a read-across strategy is not supported between Subcategory I members and the single Subcategory II member.

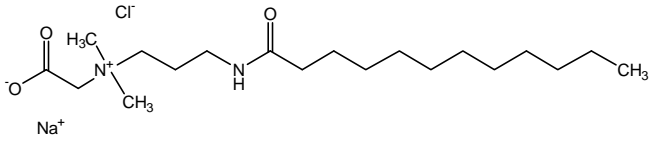
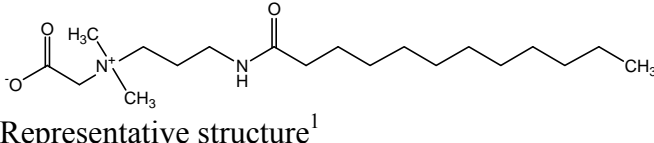
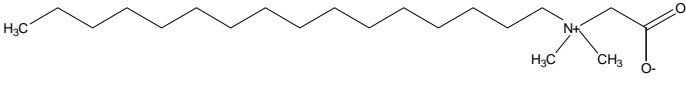
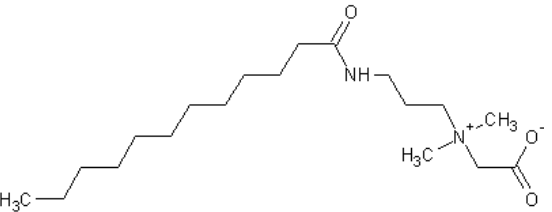
Justification for Supporting Chemicals

The sponsor indicates that the three sponsored chemicals and the two supporting chemicals are similar in structure and function. EPA supports the grouping of all sponsored and supporting chemicals for evaluation of the aquatic toxicity endpoints. However, in the absence of data to determine whether the structural difference present in one of the sponsored chemicals, CASRN 693-33-4 (1-hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt), is of toxicological significance, EPA has determined that the two supporting chemicals, each of which contain an amide group, can only be used for read-across purposes to the two sponsored chemicals that also have an amide group [i.e., CASRN 61789-39-7 and CASRN 61789-40-0], for assessment of human health effects endpoints.

1. Chemical Identity

1.1 Identification and Purity

The following description is taken from the 2004 Test Plan and Robust Summary. The FND Amphoteric are charged species, forming either, a quaternary amine inner salt (e.g. betaine), zwitter ions, or salts of zwitter ions. Test substance purity, when noted in the Robust Summaries, was given as 28.5 to 35% active ingredient in an aqueous solution. The chemical structures of the FND Amphoteric are depicted in Table 1.

Table 1: FND Amphoterics Category Sponsored and Supporting Chemical Structures		
Chemical Abstract Index Name	CASRN	Structure
Sponsored Chemicals		
1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts	61789-39-7	 <p>Representative structure¹</p>
1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salts	61789-40-0	 <p>Representative structure¹</p>
1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt	693-33-4	
Supporting Chemicals		
1-Propanaminium, N-(carboxymethyl)-N,N-dimethyl-3-[(1-oxododecyl)amino]-, inner salt	4292-10-8	
Alkylation products of N-[3-(dimethylamino)propyl] coco amides with chloroacetic acid sodium salts	70851-07-9	No Structure Available

¹ For coconut fatty acids, the sponsor provides the following distribution: 44–53% lauric acid; 13–19% myristic acid; 8–11% palmitic acid; 5–10% decanoic acid; 5–9% octanoic acid; and 5–8% linoleic acid.

1.2 Physical-Chemical Properties

The physical-chemical properties of the FND Amphoterics are summarized in Table 2. The fatty nitrogen derived (FND) amides amphoterics (Category III) are solid substances that are dispersible in water and have negligible vapor pressure.

Table 2. Physical-Chemical Properties of the Fatty Nitrogen Derived (FND) Amides Amphoterics (Category III)¹			
	Subcategory I		Subcategory II
Property	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivs., chlorides, sodium salts	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivs., inner salts	1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt
CASRN	61789-39-7	61789-40-0	693-33-4
Molecular Weight	401 (typical for C12)	343 (typical for C12)	341.5
Physical State	Solid	Solid	Solid
Melting Point	No data	No data	200–201°C (measured) ²
Boiling Point	>300°C (estimated) ^{3,4}	>300°C (estimated) ^{3,4}	>300°C (estimated) ^{3,4}
Vapor Pressure	<1.0×10 ⁻¹⁰ mm Hg at 25°C (estimated) ³	<1.0×10 ⁻¹⁰ mm Hg at 25°C (estimated) ³	<1.0×10 ⁻¹⁰ mm Hg at 25°C (estimated) ³
Water Solubility	Dispersible	Dispersible	Dispersible
Dissociation Constant (pK _a)	Not applicable	Not applicable	Not applicable
Henry's Law Constant	<1.0×10 ⁻¹⁰ atm-m ³ /mole (estimated) ³	<1.0×10 ⁻¹⁰ atm-m ³ /mole (estimated) ³	<1.0×10 ⁻¹⁰ atm-m ³ /mole (estimated) ³
Log K _{ow}	Not applicable due to dispersibility ⁵	Not applicable due to dispersibility ⁵	Not applicable due to dispersibility ⁵

¹ American Chemistry Council. Fatty Nitrogen Derivatives Panel. September 16, 2004. Revised Test Plan and Robust Summary of Fatty Nitrogen Derived Amides Category. Available online from: <http://www.epa.gov/chemrtk/pubs/summaries/fantdrad/c13319tc.htm> as of April 1, 2010.

² Beilstein search. Available online from: <https://www.reaxys.com/> as of April 1, 2010.

³ U.S. EPA. 2010. Estimation Programs Interface Suite™ for Microsoft® Windows, v4.00. U.S. Environmental Protection Agency, Washington, DC, USA. Available online from: <http://www.epa.gov/opptintr/exposure/pubs/episuitedl.htm> as of March 22, 2010.

⁴ Salts typically decompose prior to boiling.

⁵ Tolls, J.; Sijm, D. 2000. Estimating properties of surface active chemicals. In: Handbook of Property Estimation for Chemicals. Boethling R. S.; Mackay, D. (eds.). Chapter 17. Lewis Publishers, Boca Raton, FL. pp. 419–446.

2. General Information on Exposure

2.1 Production Volume and Use Pattern

According to the 2006 IUR submissions, the FND Amphoteric category chemicals had an aggregated production and/or import volume in the United States between 10.5 million pounds and 51.5 million pounds.

- CASRN 61789-39-7: 500,000 to <1 million pounds
- CASRN 61789-40-0: 10 to 50 million pounds
- CASRN 693-33-4: <500,000 pounds

CASRN 61789-39-7:

Non-confidential information in the IUR indicated that the industrial processing and uses of the chemical include other basic organic chemical manufacturing as surface active agents. Non-confidential commercial and consumer uses of this chemical were reported as “other”.

CASRN 61789-40-0:

Non-confidential information in the IUR indicated that the industrial processing and uses of the chemical include soap and cleaning compound manufacturing as intermediates and surface active agents; all other chemical product and preparation manufacturing as functional fluids and “other”. Non-confidential commercial and consumer uses of this chemical include soaps and detergents; and “other”.

CASRN 693-33-4:

No industrial processing and uses and commercial and consumer uses were reported.

2.2 Environmental Exposure and Fate

The environmental fate properties are provided in Table 3 CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are expected to have moderate mobility in soil. CASRN 61789-40-0, was readily biodegradable in two separate closed bottle tests (OECD 301D) and a modified Sturm test (OECD 301B), suggesting that both CASRNs 61789-39-7 and 693-33-4 will not be persistent in the environment. The rate of volatilization is considered negligible since these are ionic substances. The rate of hydrolysis is considered negligible. CASRNs 61789-39-7, 61789-40-0 and CASRN 693-33-4 are expected to have low persistence (P1) and low bioaccumulation potential (B1).

	Subcategory I		Subcategory II
Property	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivs., chlorides, sodium salts	1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivs., inner salts	1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt
CASRN	61789-39-7	61789-40-0	693-33-4
Photodegradation Half-life	3.0 hours (estimated) ²	2.6 hours (estimated) ²	3.2 hours (estimated) ²
Hydrolysis Half-life	Stable	Stable	Stable
Biodegradation	No data	93% after 28 days (readily biodegradable); 86% after 28 days (readily biodegradable); 57–71% after 29 days (readily biodegradable)	No data
Bioaccumulation Factor	BAF = 5.6 (estimated) ²	BAF = 1.2 (estimated) ²	BAF = 27.2 (estimated) ²
Log K _{oc}	3.2 (estimated) ²	2.8 (estimated) ²	3.8 (estimated) ²
Fugacity (Level III Model) ²			
Air (%)	<0.1	<0.1	<0.1
Water (%)	11.5	16.5	15.3
Soil (%)	87.5	83.1	81.4
Sediment (%)	1.0	0.4	3.3
Persistence ³	P1 (low)	P1 (low)	P1 (low)
Bioaccumulation ³	B1 (low)	B1 (low)	B1 (low)

¹American Chemistry Council. Fatty Nitrogen Derivatives Panel. September 16, 2004. Revised Test Plan and Robust Summary of Fatty Nitrogen Derived Amides Category. Available online from: <http://www.epa.gov/chemrtk/pubs/summaries/fantdrad/c13319tc.htm> as of April 1, 2010.

²U.S. EPA. 2010. Estimation Programs Interface Suite™ for Microsoft® Windows, v4.00. U.S. Environmental Protection Agency, Washington, DC, USA. Available online from: <http://www.epa.gov/opptintr/exposure/pubs/episuitedl.htm> as of March 22, 2010.

³Federal Register. 1999. Category for Persistent, Bioaccumulative, and Toxic New Chemical Substances. *Federal Register* 64, Number 213 (November 4, 1999) pp. 60194–60204.

3. Human Health Hazard

A summary of health effects data submitted for SIDS endpoints is provided in Table 4. The table also indicates where data for tested category members are read-across (RA) to untested members of the category.

Acute Oral Toxicity

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) Sprague-Dawley rats (5/sex/dose) were administered a single dose of the undiluted test chemical via gavage at 1800 mg/kg-bw and observed for 14 days. All five females died by day 2. No mortalities were observed in males.

LD₅₀ (male) > 1800 mg/kg

LD₅₀ (female) = Not established

(2) Male and female albino Wistar rats (5/dose) were administered a single dose of a 30% aqueous solution of the test chemical via gavage at dose levels of 4.0, 8.0, 10.0, 12.5, 16.0 or 32.0 g/kg-bw and observed for 14 days. Mortality rates were 0/5, 2/5, 4/5, 5/5, 5/5, and 5/5 at 4.0, 8.0, 10.0, 12.5, 16.0, and 32.0 g/kg-bw, respectively.

LD₅₀ = 2600 mg/kg active ingredient

(3) Male and female albino Wistar rats (5/dose) were administered a 30% aqueous solution of the test chemical via gavage at dose levels of 2.0, 4.0, 5.0, 6.3, 8.0 or 16.0 g/kg-bw and observed for 14 days. Mortality rates were 0/5, 1/5, 2/5, 3/5, 5/5, and 5/5 at 2.0, 4.0, 5.0, 6.3, 8.0, and 16.0 g/kg-bw, respectively.

LD₅₀ = 1500 mg/kg active ingredient

(4) Sprague-Dawley rats (5/sex/dose) were administered a single dose of the test chemical via gavage at 5000 mg/kg-bw and observed for 14 days. No mortalities were observed.

LD₅₀ > 1500 mg/kg active ingredient

Subcategory II: Alkyl Aminium Amphoterics

1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt (CASRN 693-33-4)

Male Sprague-Dawley rats (5/dose) were administered the test chemical via gavage at two dose levels (doses not specified) and observed for 30 days. Mortality data were not reported. The test substance purity was 94.9% according to the authors (Ridout et al., 1991).

LD₅₀ = 1620 mg/kg

Acute Dermal Toxicity

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

Sprague-Dawley rats (5/sex/dose) were administered the test chemical via dermal application at 2000 mg/kg-bw under occluded conditions for 24 hours and observed for 14 days. No mortalities were observed.

LD₅₀ >2000 mg/kg

Subcategory II: Alkyl Aminium Amphoterics

1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt (CASRN 693-33-4)

Male Sprague-Dawley rats (5/dose) were administered the test chemical via dermal application at two dose levels (doses not specified) under occluded conditions for 24 hours and observed for 30 days. Mortality data were not reported. The test substance purity was 94.9% according to the authors (Ridout et al., 1991).

LD₅₀ > 16000 mg/kg

Repeated-Dose Toxicity

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) In a 28-day study, Sprague-Dawley rats (10/sex/dose) were dosed via gavage with the test chemical in distilled water at dose levels of 0, 250, 500 or 1000 mg/kg-day once daily, 5days/week. An additional five male and five female rats were included in the control and 1000 mg/kg-day levels as recovery groups. There were no mortalities. Symptoms of local irritation of the gastrointestinal tract (head protrusion at the beginning of week 3, salivation at the beginning of week 4) were observed at 1000 mg/kg- day through the end of the study. Macroscopic examination indicated treatment-related edema of the mucosa of the forestomach at 1000 mg/kg-day; this finding disappeared in rats of the recovery group 28 days after termination of treatment. Microscopic examination of the forestomach of rats at 1000 mg/kg-day showed acanthosis of the mucosa, inflammatory edema of the submucosa and multiple ulcerations. The recovery animals showed complete and regular regeneration of the forestomach mucosa. The hematological evaluations, clinical chemistry, ophthalmic examinations and absolute and relative organ weights showed no treatment-related effects.

LOAEL = 1000 mg/kg-day (based on forestomach irritation)

NOAEL = 500 mg/kg-day

(2) In a 92-day study, Sprague-Dawley rats (10/sex/dose) were dosed via gavage with the test chemical in distilled water at dose levels of 0, 250, 500 or 1000 mg/kg-day once daily. There were no treatment-related mortalities and no treatment-related effects for either sex, during the experimental period, in the following paramaters: clinical observations, body weight gain, food

consumption, ophthalmic observations, hematologic evaluations, blood chemistry, urinalysis and organ weights. Necropsy revealed stomach ulceration at the fundus and cardiac regions in one high-dose male and one high-dose female. Microscopic post-mortem findings revealed forestomach gastritis in six male and three female rats at 1000 mg/kg-day and in two males and two females at 500 mg/kg-day. Histopathological examination of other organs revealed no evidence of treatment related effects.

LOAEL = 500 mg/kg-day (based on forestomach gastritis)

NOAEL = 250 mg/kg-day

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Reproductive Toxicity

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

No specific reproductive toxicity studies are available. In the 92-day gavage study in rats described previously, histological examinations of the reproductive organs (testes and ovaries were weighed) revealed no evidence of treatment-related effects.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Developmental Toxicity

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

Pregnant CD rats (21/dose) were administered the test substance via gavage at 0, 330, 990 or 3300 mg/kg-day (corresponding to 0, 95, 286, and 950 mg/kg-day active substance, respectively) on gestational days 5 through 19. Dams were observed for mortality, weight gain, food consumption and clinical signs of toxicity. Fetal resorptions, viability, post implantation loss, total implantations and mean litter weight were determined. One-half of fetuses were processed for soft-tissue evaluations and the other half for skeletal evaluations. One dam at 3300 mg/kg-day died. Reduced maternal body weights and stomach ulcers were observed at 990 mg/kg-day and above. Statistically significant embryotoxic effects including increased numbers of resorptions, decreased number of viable fetuses, and decreased fetal body weight, were observed at 3300 mg/kg-day, the highest dose tested. These data are summarized in the OECD SIAP on alkylamidopropyl betaines (http://webnet.oecd.org/Hpv/UI/SIDS_Details.aspx?id=F588B2B9-9862-45E3-804B-1E3113BC85EC)

LOAEL (maternal toxicity) = 286 mg/kg-day (based on reduced maternal body weight and stomach ulcers)

NOAEL (maternal toxicity) = 95 mg/kg-day

LOAEL (developmental toxicity) = 950 mg/kg-day (based on increased number of resorptions and decreased number of viable fetuses and fetal body weight)

NOAEL (developmental toxicity) = 286 mg/kg-day

Subcategory II: Alkyl Aminium Amphoterics

1-Hexadecanaminium, N-(carboxymethyl)-N, N-dimethyl-, inner salt (CASRN 693-33-4)

(1) In a prenatal developmental toxicity study, pregnant Sprague-Dawley rats (group sizes not specified) were administered the test substance in 10% ethanol by gavage at 0, 50, 150 or 250 mg/kg-day on days 6 – 15 of gestation. Surviving dams were sacrificed on gestation day 20. There were no deaths. Clinical observations seen at 250 mg/kg- day included stained and matted fur, excessive salivation, respiratory rales, diarrhea, decreased activity, hypothermia, lacrimation, labored breathing and wheezing. Similar observations were made at 150 mg/kg- day. A dose-related trend of maternal body weight inhibition was noted during both the overall gestation and treatment periods at all dose levels. Reduced food intake was also noted among all treated groups during the treatment period in an apparent dose-related trend. There were no necropsy findings. No meaningful differences among the control and treated groups were evident with respect to the number of corpora lutea, total implantations, postimplantation loss, viable fetuses and fetal body weights. The incidence of fetal malformation in the treated groups was neither statistically significant nor meaningfully different from that of the controls. Reduced or absent ossification of the skull, sternbrae #5 and/or #6 and other sternbrae occurred more frequently at 250 mg/kg- day.

LOAEL (maternal toxicity) = 50 mg/kg-day (decreased body weight gain)

NOAEL (maternal toxicity) = Not established

LOAEL (developmental toxicity) = 250 mg/kg-day (reduced ossification)

NOAEL (developmental toxicity) = 150 mg/kg-day

(2) In a pilot, prenatal developmental toxicity study, pregnant New Zealand White rabbits (8 females/dose) were administered the test chemical in 5% isopropanol by dermal application at 0, 10, 20, 40, 100 or 200 mg/kg-day on days 6 through 18 of gestation for 4 hours/day. Because of test substance-related mortality and severe topical effects, administration of the 100 and 200 mg/kg- day dosages were discontinued after the 8th and 6th daily dosages, respectively. Two additional groups (8 rabbits/group) were treated with a second vehicle control and a new low dosage of the test substance (2 mg/kg-day). These rabbits were not inseminated and were given the test substance or vehicle alone for 13 consecutive days. Surviving dams were sacrificed on gestation day 19. Three rabbits each at 100 and 200 mg/kg-day died or were moribund sacrificed. Clinical observations noted at 40, 100 and 200 mg/kg-day included uncoordinated movement, partial paralysis, red exudate of vaginal origin, green matted fur, ataxia and and/or alopecia. All skin reactions, including erythema, desquamation, atonia, fissuring, eschar and/or exfoliation demonstrated dose-dependent onset incidence and severity. All rabbits in each of the treatment groups had a minimum of grade 1 erythema observed at least once. None of the vehicle control rabbits had any of these signs of skin reactions present. Average body weight gain was inhibited at 2.0 – 200 mg/kg-day. The body weight effect was dosage dependent and

considered to be biologically significant at ≥ 10 mg/kg-day. Reduced average daily feed consumption was noted at ≥ 2 mg/kg-day and was considered biologically significant at ≥ 40 mg/kg-day. Pregnancy occurred in six or seven of the eight rabbits in each group. An increased incidence of resorptions was observed in maternally toxic dosages of 40, 100 and 200 mg/kg-day. At 100 and 200 mg/kg-day, an associated decrease in average litter size (live fetuses) was observed. Gross necropsy was performed on the does following Caesarean-section. No further information is provided. Fetuses were not examined.

LOAEL (maternal toxicity) = 10 mg/kg-day (decreased body weight gain)

NOAEL (maternal toxicity) = Not established

LOAEL (developmental toxicity) = 40 mg/kg-day (increased resorptions)

NOAEL (developmental toxicity) = 20 mg/kg-day

Genetic Toxicity – Gene Mutation

Subcategory I: Acyl Amino Propanaminium Amphoterics

In vitro

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) In a reverse-mutation assay, *S. typhimurium* strains TA1535, TA98, TA100, TA1537 and TA1538 were exposed to CASRN 61789-40-0 in the presence of metabolic activation at concentrations of 4, 16, 64, 256 and 1024 $\mu\text{g}/\text{plate}$ and in the absence of metabolic activation at concentrations of 1, 4, 16, 64, and 256 $\mu\text{g}/\text{plate}$. No information on positive controls was provided. Cytotoxicity was not observed. No positive responses were observed with the test substance.

CASRN 61789-40-0 was not mutagenic in this assay.

(2) In a reverse-mutation assay, *S. typhimurium* strains TA1535, TA98, TA100, TA1537 and TA1538 were exposed to CASRN 61789-40-0 in the presence and absence of metabolic activation at concentrations of 1, 5, 50, 100, 125, 150, and 300 $\mu\text{g}/\text{plate}$. No information on positive controls was provided. In a range-finding study, cytotoxicity was observed at 146 $\mu\text{g}/\text{plate}$ and higher. No positive responses were observed with the test substance.

CASRN 61789-40-0 was not mutagenic in this assay.

(3) In a reverse-mutation assay, *S. typhimurium* strains TA1535, TA98, TA 1537 and TA 1538 were exposed to CASRN 61789-40-0 in the presence and absence of metabolic activation at concentrations ranging from 0.5 – 500 $\mu\text{g}/\text{plate}$. Positive controls were tested concurrently and responded appropriately. Cytotoxicity was observed beginning at 150 $\mu\text{g}/\text{plate}$. No positive responses were observed with the test substance.

CASRN 61789-40-0 was not mutagenic in this assay.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Genetic Toxicity – Chromosomal Aberrations

Subcategory I: Acyl Amino Propanaminium Amphoterics

Adequate data were not identified for this endpoint.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Skin Irritation

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) Six New Zealand White rabbits (sex not reported) were administered CASRN 61789-40-0 (0.5 mL) as a 50.7% w/v dilution in tap water on clipped intact and abraded skin sites under occluded conditions for 24 hours. Eschar formation was seen in three of six rabbits and erythema and edema were seen in all rabbits. The primary irritation index was 4.54. These data are summarized in TSCATS OTS0534768.

CASRN 61789-40-0 was irritating to rabbit skin in this study.

(2) In the acute dermal toxicity study in Sprague-Dawley rats described previously, slight or well-defined erythema was observed at the application site on day 2. The erythema persisted in three male and all female rats on day 3. Sloughing or hyperkeratinization affected the treated skin of rats on days 4 and 5 only.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Eye Irritation

Subcategory I: Acyl Amino Propanaminium Amphoterics

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

In a Draize test, nine New Zealand white rabbits (sex not reported) were instilled with 0.1 mL of CASRN 61789-40-0 as a 50.7% w/v dilution in tap water, into the eyes. The eyes of six rabbits were rinsed with tap water after 24 hours. Effects included redness and discharge (grade 1 – 2), as well as chemosis (grade 1 – 3). Corneal effects were also observed (grade 1 – 4). Washing did not appear to reduce irritation. The average maximum irritation scores after 1 hour were 16

and 14 for unwashed and washed eyes, respectively. These data are summarized in TSCATS OTS0534768.

CASRN 61789-40-0 was irritating to rabbit eyes in this study.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Skin sensitization

Subcategory I: Acyl Amino Propanaminium Amphoterics

I-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

In a local lymph node assay (LLNA), CASRN 61789-40-0 was shown to be sensitizing in female CBA/Ca mice (4/dose) (Kimber et al., 1994).

CASRN 61789-40-0 was a skin sensitizer in a mouse LLNA.

Subcategory II: Alkyl Aminium Amphoterics

No data are available.

Conclusion:

Subcategory I: Acyl Amino Propanaminium Amphoterics

The acute toxicity of CASRN 61789-40-0 is low in rats by the oral and dermal routes. A 28-day oral gavage repeated-dose toxicity study in rats showed forestomach irritation in males and females at 1000 mg/kg-day (highest dose tested); the NOAEL is 500 mg/kg-day. A 92-day oral gavage repeated-dose toxicity study in rats showed forestomach gastritis in males and females at 500 mg/kg-day and above; the NOAEL is 250 mg/kg-day. No reproductive toxicity studies were available. However, the 92-day oral gavage study in rats showed no adverse treatment-related effects on reproductive organs. In a developmental toxicity study in rats administered CASRN 61789-40-0 via gavage, reduced maternal body weights and stomach ulcers were observed at 286 mg/kg-day; the NOAEL for maternal toxicity is 95 mg/kg-day. Signs of developmental toxicity consisted of increased numbers of resorptions, decreased number of viable fetuses and decreased fetal body weight at 950 mg/kg-day; the NOAEL for developmental toxicity is 286 mg/kg-day. CASRN 61789-40-0 was not mutagenic in bacteria *in vitro*. Adequate studies were not identified for chromosomal aberration. CASRN 61789-40-0 is irritating to rabbit skin and eyes and is a skin sensitizer in mice based on the local lymph node assay.

Subcategory II: Alkyl Aminium Amphoterics

The acute toxicity of CASRN 693-33-4 is low in rats by the oral and dermal routes. There were no repeated-dose toxicity studies and no reproductive toxicity studies available. In a prenatal developmental toxicity study in rats administered CASRN 693-33-4 via gavage, decreased body weight gain was observed at 50 mg/kg-day (the lowest dose tested) and above; a NOAEL for maternal toxicity was not established. Reduced or absent ossification of the skull was observed at 250 mg/kg-day; the NOAEL for developmental toxicity is 150 mg/kg-day. In a dermal pilot developmental toxicity study in rabbits, decreased body weight gain and clinical signs were

observed in dams treated with 10 mg/kg-day (the lowest dose tested) and above; a NOAEL for maternal toxicity was not established. Increased resorptions were observed starting at 40 mg/kg-day; the NOAEL for developmental toxicity is 20 mg/kg-day. No genetic toxicity studies were available. No irritation or sensitization studies were available.

Table 4. Summary Table of the Screening Information Data Set as Submitted under the U.S. HPV Challenge Program: Human Health Data			
	Subcategory I		Subcategory II
Endpoints	SPONSORED CHEMICAL 1-Propanaminium, 3-amino- N-(carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts (61789-39-7)	SPONSORED CHEMICAL 1-Propanaminium, 3-amino-N- (carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (61789-40-0)	SPONSORED CHEMICAL 1-Hexadecanaminium, N-(carboxymethyl)- N,N-dimethyl-, inner salt (693-33-4)
Acute Oral Toxicity LD₅₀ (mg/kg)	No Data 1500 (RA)	1500	1620
Acute Dermal Toxicity LD₅₀ (mg/kg)	No Data > 2000 (RA)	> 2000	>16000
Repeated-Dose Toxicity NOAEL/LOAEL Oral gavage (mg/kg- day)	No Data NOAEL = 250 LOAEL = 500 (RA)	(92-day, rat) NOAEL = 250 LOAEL = 500	Data gap
Reproductive Toxicity (mg/kg-day)	No Data No effects were seen following evaluation of reproductive organs in a 92 day oral repeated-dose study in rats. (RA)	No effects were seen following evaluation of reproductive organs in a 92 day oral repeated- dose study in rats.	Data gap
Developmental Toxicity NOAEL/LOAEL Oral gavage (mg/kg-day) Maternal Toxicity	No Data NOAEL = 95 LOAEL = 286	(rat) NOAEL = 95 LOAEL = 286	(rat) NOAEL = Not established LOAEL = 50
Developmental Toxicity	NOAEL = 286 LOAEL = 950 (RA)	NOAEL = 286 LOAEL = 950	NOAEL = 150 LOAEL = 250
Developmental Toxicity NOAEL/LOAEL Dermal (mg/kg- day) Maternal Toxicity	–	–	(rabbit) NOAEL = Not established LOAEL = 10
Developmental Toxicity	–	–	NOAEL = 20 LOAEL = 40
Genetic Toxicity – Gene Mutation In vitro	No Data Negative (RA)	Negative	Data gap

Table 4. Summary Table of the Screening Information Data Set as Submitted under the U.S. HPV Challenge Program: Human Health Data			
	Subcategory I		Subcategory II
Endpoints	SPONSORED CHEMICAL 1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts (61789-39-7)	SPONSORED CHEMICAL 1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (61789-40-0)	SPONSORED CHEMICAL 1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt (693-33-4)
Genetic Toxicity – Chromosomal Aberrations <i>In vitro</i>	Data gap		Data gap
Additional Information Skin Irritation Eye Irritation	No Data Irritating Irritating (RA)	Irritating Irritating	Data gap Data gap
Skin Sensitization	No Data Sensitizer (RA)	Sensitizer	Data gap

– indicates that the endpoint was not addressed for this chemical

4. Hazard to the Environment

A summary of aquatic toxicity data submitted for SIDS endpoints is provided in Table 5. The table also indicates where data for tested category members are read-across (RA) to untested members of the category. Additional SIDS environmental toxicological data for CASRN 61789-40-0 (1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine)) can be found at http://webnet.oecd.org/Hpv/UI/SIDS_Details.aspx?id=F588B2B9-9862-45E3-804B-1E3113BC85EC

Acute Toxicity to Fish

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts (CASRN 61789-39-7)

Fathead minnows (*Pimephales promelas*) were exposed to CASRN 61789-39-7 at nominal concentrations of 0, 0.056, 0.10, 0.18, 0.32 or 0.56 mg/L under static conditions for 96 hours. Complete mortality occurred at 0.32 and 0.56 mg/L within the first 24 hours.

96-h LC₅₀ = 0.23 mg/L

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) Zebrafish (*Brachydanio rerio*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0, 5.66 or 8.0 mg/L under static conditions for 96 hours. The test substance purity was reportedly 30% active ingredient (ai). All fish exposed to 8.0 mg/L died within the first 24 hours of exposure.

96-h LC₅₀ = 2.0 mg/L (based on 100% ai)

(2) Zebrafish (*Brachydanio rerio*) were exposed to CASRN 61789-40-0 at nominal concentrations of 2, 8, 4.0, 5.6, 8.0, 11, and 16 mg/L under semi static conditions for 96 hours. The test substance purity was reported as 29-32% active ingredient.

96-h LC₅₀ = 2.0 mg/L (based on 100% ai)

(3) Fresh water fish (*Cyprinus carpio*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0, 1.0, 1.7, 3.0, 5.0, and 9 mg/L under semi static conditions for 96 hours. The test substance purity was reportedly 29.6% active ingredient.

96-h LC₅₀ = 1.9 mg/L (based on 100% ai)

(4) Fresh water fish (*Brachydanio rerio*) were exposed to CASRN 61789-40-0 at nominal concentrations of 1.0, 10, and 100 mg/L under static conditions for 96 hours. The test substance purity was reportedly 28% active ingredient.

96-h LC₅₀ = 0.28-2.8 mg/L (based on 100% ai)

Acute Toxicity to Aquatic Invertebrates

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) Water fleas (*Daphnia magna*) were exposed to CASRN 61789-40-0 at measured concentrations of < 1.2, 5.55, 21.08, and 105.8 mg/L under static conditions for 48 hours. The test substance purity was reported as 30% active ingredient.

48-h EC₅₀ = 6.5 mg/L (based on 100% ai)

(2) Water fleas (*Daphnia magna*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0, 0.5, 1, 2, 4, 8 or 16 mg/L under static conditions for 48 hours. The high test concentration of 16 mg/L produced 100% immobilization.

48-h EC₅₀ = 1.9 mg/L

1-Hexadecanaminium, N-(carboxymethyl)-N,N-dimethyl-, inner salt (CASRN 693-33-4)

Aquatic amphipods (*Echinogammarus tibaldii*) were exposed to CASRN 693-33-4 at nominal concentrations (concentrations not indicated) under static conditions for 96 hours.

96-h EC₅₀ = 2.5 mg/L

Toxicity to Aquatic Plants

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

(1) Algae (*Scenedesmus subspicatus*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0, 0.32, 1.0, 3.2, 32 or 100 mg/L under static conditions for 72 hours.

72-h EC₅₀ (growth) = 48 mg/L

72-h EC₅₀ (biomass) = 30 mg/L

(2) Algae (*Scenedesmus subspicatus*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0, 0.01, 0.03, 0.1, 0.3, 1.0, 3.0 or 10 mg/L under static conditions for 96 hours. The test substance purity was reportedly 30% active ingredient.

96-h EC₅₀ (growth) = 0.55 mg/L (based on 100% ai)

(3) Algae (*Scenedesmus subspicatus*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0.01, 0.03, 0.1, 0.3, 1.0, 3.0, and 10 mg/L under static condition for 72 hours. The test substance purity was reportedly 30% active ingredient.

72-h EC₅₀ (growth) = 1.3 mg/L (based on 100% ai)

72-h EC₅₀ (biomass) = 0.57 mg/L (based on 100% ai)

Chronic toxicity to Fish

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

Fish (*Oncorhynchus mykiss*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0.05, 0.16, 0.50, 1.6, and 5.0 mg/L for 28 days in a fish flow-through test. The test substance purity was reported as 32.1% active ingredient.

28-d NOEC = 0.16 mg/L (based on 100% ai)

28-d LOEC = 0.5 mg/L (based on 100% ai)

Chronic toxicity to Aquatic Invertebrates

1-Propanaminium, 3-amino-N-(carboxymethyl)-N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (CASRN 61789-40-0)

Water fleas (*Daphnia magna*) were exposed to CASRN 61789-40-0 at nominal concentrations of 0.047, 0.188, 0.75, 3.0, and 12 mg/L under semi-static conditions for 21 days in a *Daphnia* reproduction test. The test substance purity was reported as 30% active ingredient.

21-d NOEC = 0.9 mg/L (based on 100% ai)

21-d LOEC = 3.6 mg/L (based on 100% ai)

Conclusion: The 96-hour fish LC₅₀ values for CASRNs 61789-39-7, 61789-40-0, and 693-33-4 are 0.23, 2.0, and <0.23 mg/L, respectively. The 48-hour aquatic invertebrate EC₅₀ values for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 1.9, 1.9, and 2.5 mg/L, respectively. The 96-hour aquatic plant EC₅₀ values for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.55, 0.55, and <0.55 mg/L, respectively. The aquatic invertebrate chronic LOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 3.6, 3.6, and <3.6 mg/L, respectively. The aquatic invertebrate chronic NOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.9, 0.9, and <0.9 mg/L, respectively. The fish chronic LOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.5, 0.5, and <0.5 mg/L. The fish chronic NOECs for CASRNs 61789-39-7, 61789-40-0 and 693-33-4 are 0.16, 0.16 and <0.16mg/L.

Table 5. Summary Table of the Screening Information Data Set as Submitted under the U.S. HPV Challenge Program: Aquatic Toxicity Data			
Endpoints	SPONSORED CHEMICAL 1-Propanaminium, 3-amino- N-(carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, chlorides, sodium salts (61789-39-7)	SPONSORED CHEMICAL 1-Propanaminium, 3-amino- N-(carboxymethyl)- N,N-dimethyl-, N-coco acyl derivatives, inner salt (betaine) (61789-40-0)	SPONSORED CHEMICAL 1-Hexadecanaminium, N-(carboxy-methyl)- N,N-dimethyl-, inner salt (693-33-4)*
Fish 96-h LC ₅₀ (mg/L)	0.23 (m)	2.0 (m)	No Data <0.23* (RA)
Aquatic Invertebrates 48-h EC ₅₀ (mg/L)	No Data 1.9 (RA)	1.9 (m)	2.5 (96-h, m)
Aquatic Plants 96-h EC ₅₀ (mg/L) (growth rate)	No Data 0.55 (RA)	0.55 (m)	No Data 0.55 (RA)
Chronic Aquatic Invertebrates 21-d (mg/L)	No Data LOEC = 3.6 NOEC = 0.9 (RA)	LOEC = 3.6 (m) NOEC = 0.9 (m)	No Data LOEC = <3.6* NOEC = <0.9* (RA)
Chronic Fish 28-d (mg/L)	No Data LOEC = 0.5 NOEC = 0.16 (RA)	LOEC = 0.5 (m) NOEC = 0.16 (m)	No Data LOEC = <0.5* NOEC = <0.16* (RA)

Measured data in bold text; (RA) = Read Across

*Due to hydrophobic nature of CASRN 693-33-4, any toxicity observed is most likely to be greater than the less hydrophobic members (CASRN 61789-39-7 and 61789-40-0) of this category.

5. References

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