BPD/BPA Coalition

BPD/BPA Coalition
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BPA (Benzene Phosphinic Acid) Robust Summaries

Submitted to the U.S. Environmental Protection Agency

by the

BPD/BPA Coalition

Updated

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1. Substance Information

CAS Number:	**1779-48-2**
Chemical Name:	Phosphinic acid, phenyl
Structural Formula:	$C_6H_7O_2P$
Other Names:	BPA, benzene phosphinic acid
Exposure Limits:	Not established

2. Physical – Chemical Properties

2.1. Melting Point:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Year:	No data available
Value:	83 °C
Decomposition:	No data available
Conclusions:	The melting point of BPA is 83 °C
Reliability:	4
Reference:	Akzo Nobel Functional Chemicals LLC (2000) BPA MSDS revision 3, revised 7/12/2000
Remarks:	None
Additional References for Melting Point Studies:	None

2.2. Boiling Point:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Year:	No data available
Value:	180 °C
Pressure:	760
Pressure Unit:	mmHg
Decomposition:	No data available
Conclusions:	The boiling point of BPA is 180 °C
Reliability:	4

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Reference:	Acros Organics MSDS Phenylphosphonic acid. Revision: 2/18/2002
Remarks:	None
Additional References for Boiling Point Studies:	None

2.3. Density:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Year:	No data available
Value:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for Density Studies:	None

2.4. Vapor Pressure:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	Model calculation
GLP:	No
Year:	2003
Value:	0.00014
Temperature° C:	25 °C
Pressure Unit:	mmHg
Decomposition:	No data available
Conclusions:	The vapor pressure of BPA is 0.00014 mmHg
Reliability:	1
Reference:	MBPWIN Version 1.40
Remarks:	None
Additional Reference for Vapor Pressure Studies:	None

2.5. Partition Coefficient (log Kow):

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	Model calculation
GLP:	No
Year:	2003

Log Kow:	0.04
Temperature°C:	No data available
Conclusions:	The log Kow of BPA is estimated to be 0.04
Reliability:	1
Reference:	WSKOW version 1.40
Remarks:	None
Additional References for Partition Coefficient Studies:	None

2.6. Water Solubility:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No
Year:	2003
Value at temperature°C:	77,000 mg/L @25° C
Description of solubility:	No data available
PH value and concentration at temperature °C:	pH = 1 at 25 °C for a saturated solution pH = 2 for a 1% solution
pka value at 25°C:	1.35, 1.92
Conclusions:	The soluability of BPA is 77,000 mg/L @25° C
Reliability:	4
Reference:	Akzo Nobel Functional Chemicals LLC (2000) BPA MSDS revision 3, revised 7/12/2000
Remarks:	pH of saturated solution is 1. Akzo Nobel Chemicals Project 6017000, 6/19/03. pH of a 1% solution is 2. Acros Organics MSDS Phenylphosphonic acid. Revision: 2/18/2002
Additional References for Water Solubility Studies:	PKa reference: Morelli, J.J. (2003) Technical Information Report 31118. Akzo Nobel Chemicals, Inc. Dobbs Ferry, NY.

2.7. Flash Point:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Year:	No data available
Results:	No data available
Conclusions:	No data available
Reliability:	No data available

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Reference:	No data available
Remarks:	None
Additional References for Flash Point Studies:	None

2.8. Flammability:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Year:	No data available
Results:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for Flammability Studies:	None

3. Environmental Fate

3.1. Photodegradation:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN Model calculation: (AopWin v1.90)
GLP:	No
Type:	Model calculation
Year:	2003
Light Source:	Not applicable
Light Spectrum (nm):	Not applicable
Half-life:	61.4 hours (5.1 days for 12 hour days)
Breakdown Products:	No data available
Conclusions:	The half-life of BPA in the atmosphere is 61.4 hours (5.1 days for 12 hour days)
Reliability	1
Reference:	AOP Version 1.90
Remarks:	None
Additional References for Photodegradation Studies:	None

3.2. Stability in Water:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
GLP:	No data available
Type:	No data available
Year:	No data available
Half-life at a specific pH:	No data available
Breakdown Products:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for Stability in Water Studies:	None

3.3. Transport (Fugacity):

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN Model calculation STP Fugacity model
GLP:	No
Type:	Model calculation
Year:	2003
Media:	Air, Water, Soil, Sediment

Distributions:

Compartment	Released 100% to air	Release 100% to water	Release 100% to soil
Air	0.118	7.11e-007	0.000175
Water	27.4	99.8	21.6
Soil	72.4	0.000438	78.4
Sediment	0.0461	0.168	0.0363

Adsorption Coefficient:	No data available
Desorption:	No data available
Volatility:	No data available
Conclusions:	Partitions primarily to soil and water
Reliability:	1
Reference:	EPIWIN (version 3.1) STP Fugacity model
Remarks:	When released equally to air, water, and soil, BPA is estimated to be distributed 0.0422 percent to air, 44.9 percent to water, 55 percent to soil, and 0.0755 percent to sediment

Additional References for Transport (Fugacity) Studies:	None

3.4. Biodegradation:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN 3.10 (BIOWIN v4.00)
Type:	Model calculation
GLP:	No
Year:	2003
Degradation% after time:	No data available
Breakdown Products:	No data available
Concentration Of Test Chemical:	No data available
Analytical Method:	No applicable
Conclusions:	Ultimate Biodegradation Timeframe: weeks Primary Biodegradation Timeframe: days-weeks
Reliability:	1
Reference:	BIOWIN Version 4.00
Remarks:	None
Additional References for Biodegradation Studies:	None

3.5. Bioconcentration:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN 3.10 (Bcfwin v2.14)
Type:	Model calculation
GLP:	No
Year:	2003
Results:	Log BCF = 0.5 (BCF = 3.162)
Conclusions:	Not expected to bioaccumulate
Reliability:	1
Reference:	Bcfwin Version 2.14
Remarks:	None
Additional References for Bioconcentration Studies:	None

4. Ecotoxicity

4.1. Acute Toxicity to Fish:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN 3.10 (ECOSAR Version 0.99)
Type:	Model calculation
GLP:	No
Year:	2003
Species/Strain/:	Not applicable
Supplier:	Not applicable
Analytical Monitoring:	Not applicable
Exposure Period:	96 hours
Nominal/Measured Concentrations:	Not applicable
LC50:	9721.6 mg/L
Conclusions:	Predicted to be practically nontoxic to fish
Reliability:	1
Reference:	ECOSAR Version 0.99
Remarks:	None
Additional References for Acute Toxicity to Fish Studies:	None

4.2. Acute Toxicity to Invertebrates:.

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN 3.10 (ECOSAR version 0.99)
Type:	Model calculation
GLP:	No
Year:	2003
Species/Strain/:	Daphnid
Supplier:	Not applicable
Analytical Monitoring:	No applicable
Exposure Period:	48 hours
Nominal/Measured Concentrations:	Not applicable
LC50:	6857.7 mg/L
Conclusions:	Predicted to be practically nontoxic to invertebrates
Reliability:	1
Reference:	ECOSAR version 0.99
Remarks:	None

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Additional References for Acute Toxicity to Invertebrates Studies:	None

4.3. Acute Toxicity to Aquatic Plants:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	EPIWIN 3.10 (ECOSAR version 0.99)
Type:	Model calculation
GLP:	No
Year:	2003
Species/Strain/ Supplier:	Green algae
Analytical Monitoring:	Not applicable
Exposure Period:	96 hours
Nominal/Measured Concentrations:	Not applicable
EC50:	3829.8 mg/L
Conclusions:	Predicted to be practically non toxic to green algae
Reliability:	1
Reference:	ECOSAR version 0.99
Remarks:	None
Additional References for Acute Toxicity to Aquatic Plants Studies:	None

5. Mammalian Toxicity

5.1. Acute Toxicity:

5.1.1. Oral

Identity:	BPA (PHOSPHINIC ACID, PHENYL-) CAS# 1779-48-2
Method:	Fixed dose
Type:	Acute oral gavage
GLP:	No
Year:	1969
Species/Strain:	Rat, not specified
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	5
Vehicle:	Water (assumed), 1% tragacanth, 0.5% Tween 20

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Route Of Administration:	Oral (gavage assumed)
Time Of Observation Period:	14 days
Doses Administered:	Females: 464, 1000, 2150 mg/kg as 10% concentration of BPA Males: 1000, 2150, (as 10% concentration of BPA) 4640 mg/kg as 25% concentration of BPA
LD50:	1710 mg/kg for male rats and 1470 mg/kg for female rats
Conclusions:	Females: No apparent toxicity at 464 mg/kg. At necropsy, the 464 mg/kg animals appeared grossly normal. At 1000 mg/kg 5 of 5 animals survived. There was acute depression, dark soft stool, and periods of erratic excitation. At 2150 mg/kg, 5 0f 5 animals died between 6 and 10 hours after dosing. At necropsy, gastrointestinal hemorrhage was noted. Males: The 1000 mg/kg level had no mortality but produced depression subsiding after 48-96 hours. Higher levels produced dark soft stool and acute depression with periods of excitation. At necropsy these animals had areas of necrotic tissue in the gastrointestinal tract. At 2150 mg/kg, 4 of 5 males died between 10 and 14 hours after dosing. At necropsy, the survivor had areas of necrotic tissue in the gastrointestinal tract. At 4640 mg/kg, 5 of 5 males died between 3 and 5 hours after dosing. Necropsy findings describe extensive areas of gastrointestinal hemorrhage.
Reliability:	3
Reference:	Stauffer Chemical Company (1968) Toxicology Lab Report T-1233 Benzene Phosphinic Acid
Remarks:	The clinical signs described and the necropsy results are consistent with the interpretation that these animals died as a result of the strong acid properties of BPA causing gastrointestinal bleeding and death as a consequence. The clinical signs, in particular, are consistent with the interpretation that these animals probably experienced significant distress.
Additional References for Acute Oral Toxicity Studies:	Haskell Data MR-1703-013, HL-0009-54 cited in Microfiche OTS 05555311 (1992). Eastman Kodak Co, TSCA 8e submission.

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5.1.2. Dermal

Identity:	BPA (PHOSPHINIC ACID, PHENYL-) CAS# 1779-48-2
Method:	Occluded patch
Type:	Acute 24 hour single dose
GLP:	No
Year:	1968
Species/Strain:	Rabbit (not specified)
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	2
Vehicle:	None
Route Of Administration:	Neat material was applied to closely clipped intact abdominal skin under rubber dental damming secured with gauze and tape for 24 hours.
Time Of Observation Period:	14 days
Doses Administered:	4460 mg/kg as neat material, as received
LD50:	> 4460 mg/kg
Conclusions:	Moderate erythema was observed which subsided within 4 days. No eschar was observed.
Reliability:	3
Reference:	Stauffer Chemical Company (1968) Toxicology Lab Report T-1233 Benzene Phosphinic Acid
Remarks:	None
Additional References for Acute Dermal Toxicity Studies:	None

5.1.3. Irritation

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	Draize (Federal Hazardous Substance Act 21 CFR 191.11)
Type:	Occluded, normal and abraded
GLP:	No
Year:	1968
Species/Strain:	Rabbit (not specified)
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	1 male and 5 females
Vehicle:	None
Route Of Administration:	Neat material was applied to closely clipped intact abdominal skin under rubber dental damming secured with gauze and tape for 24 hours.

Time Of Observation Period:	14 days
Concentration Of Test Material:	500 mg administered neat, as received
Results:	Results: Intact skin: Erythema at 24 hours in all animals (2 had a score of 1, the remaining had a score of 2)and 2 of 6 animals had erythema scores of 1 at 48 hours. No edema was noted in at the intact administration sites. Abraded skin: All rabbits had erythema scores of 4 at 24 and 72 hours. Edema scores at 24 hours ranged from 1-3 with an average of 1.8. At 72 hours, the average erythema score as 3.7.
Conclusions:	Overall, the primary irritation index was 3.9 and considered a moderate skin irritant. Because the primary irritation index was < 5, BPA was not considered to be a primary skin irritant.
Reliability:	3
Reference:	Stauffer Chemical Company (1968) Toxicology Lab Report T-1233 Benzene Phosphinic Acid
Remarks:	It is probable that these results are at least partially artifactual in that the material was applied as neat material. The material applied to the abraded skin was in contact with aqueous serosanguineous fluid and probably rapidly became a saturated acid solution with a pH of approximately 1. The minimal moisture at the intact sites probably lead to a lack of a significant amount of the saturated solution in contact with the skin. Contemporary practice would include wetting the material with a solvent or water to increase skin contact. If this procedure had been in this study, the response on intact and abraded skin would probably have been similar and the conclusion reached that BPA was a moderate skin irritant.
Additional References for Acute Dermal Irritation Studies:	None

5.1.4. Sensitization

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
Type:	No data available
GLP:	No data available
Year:	No data available

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Species/Strain:	No data available
Sex:	No data available
No. Of Animals Per Sex Per Dose:	No data available
Vehicle:	No data available
Route Of Administration:	No data available
Time Of Observation Period:	No data available
Concentration Of Test Material:	No data available
Results:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for Acute Dermal Sensitization Studies:	None

5.1.5. Eye Irritation

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	Draize
Type:	No
GLP:	No
Year:	1968
Species/Strain:	Rabbit (not specified)
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	3
Vehicle:	None
Route Of Administration:	Conjunctival sac (assumed)
Time Of Observation Period:	72 hours
Concentration Of Test Material:	10 mg of BPA as received, probably > 95%
Results:	Pain, complete destruction of eye structure and most of conjunctivia, severe hemorrhage.
Conclusions:	Severe eye irritant
Reliability:	3

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Reference:	Stauffer Chemical Company (1968) Toxicology Lab Report T-1233 Benzene Phosphinic Acid
Remarks:	None
Additional References for Acute Eye Irritation Studies:	None

5.2. Repeated Dose Toxicity:

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
Type:	Repeated dose
GLP:	No data available
Year:	1981
Species/Strain:	Rat (unspecified)
Sex:	Male
No. Of Animals Per Sex Per Dose:	5
Vehicle:	Corn oil “carrier”
Route of Administration:	Dietary admixture
Time of Observation Period:	14 days
Doses Administered:	01.%, 1% 85, 863 mg/kg
Frequency of Treatment:	Continuous (assumed)
NOAEL (NOEL):	1%, 863 mg/kg
LOAEL (LOEL):	No applicable
Toxic Response By Dose Level:	None
Conclusions:	NOEL was the highest dose tested
Reliability:	4
Reference:	0083 Phenylphosphinic acid. Cited in MicrofícheOTS 05555311 (1992) Eastman Kodak Co, TSCA 8e submission
Remarks:	Endpoints included feed intake, weight gain, clinical signs, hematology, clinical chemistry, organ weights, gross pathology, and histopathology

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	OECD 407
Type:	Repeated dose
GLP:	Yes
Year:	2003 (year published)
Species/Strain:	Rat/Crl:CD (SD) IGS BR
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	5
Vehicle:	Certified Rodent LabDiet 502 (chunk)
Route of Administration:	Dietary admixture
Time of Observation Period:	31 days
Doses Administered:	0, 100, 1000, 10000 ppm ~0, 8, 80, 800 mg/kg
Frequency of Treatment:	Continuous
NOAEL (NOEL):	10000 ppm 779 mg/kg (males) 859 mg/kg (females)
LOAEL (LOEL):	Not applicable
Toxic Response By Dose Level:	None
Conclusions:	NOEL was the highest dose testing
Reliability:	2
Reference:	Donner, E.M., Kennedy, G.L., Jr., and Stadler, J.S. (2003) Four Week Feeding Toxicity Study with Phenylphosphinic Acid in Rats
Remarks:	Endpoints included hematology, clinical chemistry, gross pathology, histopathology, clinical observations, body weight, food consumption, ophthalmologic examinations and a limited functional observation battery
Additional References for Repeated Dose Toxicity Studies:	None

5.3. Reproductive Toxicity:

Identity:	Toldimfos, (phosphinic acid, [4 – (dimethylamino) -2-methylphenyl]-, sodium salt, CAS # 575-75-7
Method:	OECD 416
Type:	Reproductive/developmental
GLP:	Yes

Year:	1996
Species/Strain:	Rat, Wistar SPF
Sex:	Male and female
No. Of Animals Per Sex Per Dose:	26 female and 13 male
Vehicle:	Saline
Route Of Administration:	Subcutaneous
Time Of Observation Period:	Two generations
Doses Administered:	0, 10, 20, and 50 mg/kg
Frequency Of Treatment:	Daily
Premating Exposure For Males:	From weaning (both generations)
Premating Exposure For Females:	14 days
P NOAEL (NOEL):	50 mg/kg
P LOAEL (LOEL):	Not applicable
F1 NOAEL (NOEL):	See conclusions
F1 LOAEL (LOEL);	Not applicable
F2 NOAEL (NOEL):	See conclusions
F2 LOAEL (LOEL):	Not applicable
P/F1/F2 Toxic Response By Dose Level:	F1 and F2: 50mg/kg: ~ 10% loss of whole litters surviving (cannibalism) F1: All groups (treated and untreated) decreased male fertility F1: All groups groups: dose <u>independent</u> increased pup mortality primarily due to cannibalism:

F1 Generation	
Dose Group (mg/kg)	**Percentage of Dams showing cannibalism**
0	29.2
10	52.6
20	19.0
50	47.6

F2: All groups: dose independent increased pup mortality primarily due to cannibalism:

F2 Generation	
Dose Group (mg/kg)	**Percentage of Dams showing cannibalism**
0	23.1
10	52.9
20	53.3
50	50.0

No treatment-related histopathologic abnormalities in the P or F1 reproductive system or pituitary.
No effect on the percentage of gravid females, gestation period, mean litter size, sex distribution of pups, live birth index, developmental stage of offspring and the bodyweight of pups and their growth rate.
F1: Control: 2 pups with unspecified malformations
50 mg/kg: 1 pup with an unspecified malformation
F2: 10 mg/kg and 20 mg/kg: 4 pups with malformations – aplasia of ureters, anus, and kidneys
F2: 50 mg/kg: No gross malformations recorded

Conclusions: The EMEA report states, "Although a NOEL value could not be retained from this study, this fact should not be considered of pivotal importance in the overall safety assessment of toldimfos, as the route of administration in this study was subcutaneous, not oral." From the documents cited in the section Additional References for Reproductive Toxicity Studies, it is clear that there was agreement between the EMEA and company experts that the pup mortality was unusually high in this study. The EMEA report did not consider their inability to "retain a NOEL" to be of pivotal importance because of their focus. The submitting company expert report stated the NOEL as 50 mg/kg, the highest dose tested. Apparently, there was correspondence about the retention of the NOEL because an expert report subsequently submitted by the original study director with another expert concluded that, although the dose independent pup cannibalism seen in the study was higher than historical levels for the supplier of the animals, the dose independent pup cannibalism in this study was due to the unique circumstances of the study, in particular, the increased handling required by the subcutaneous dosing route. Despite the conclusion by the EMEA that a NOEL could not be retained for reproductive effects (primarily

	because of increased cannibalism of pups in all treated groups) this study does not show effects on reproduction or development attributable to the test article. The explanation that the dose independent cannibalism was a result of the increased handling necessitated by the subcutaneous administration route is quite plausible. In addition, the physical malformations observed in pups in this study were sporadic and not dose-related.
Reliability:	2
Reference:	http://www.emea.eu.int/pdfs/vet/mrls/071799en.pdf
Remarks:	Because toldimfos is used as a metabolic stimulant in veterinary medicine, it is possible that the dose independent cannibalism in the treated groups may also have the pharmacologic action of todlimfos as a contributing factor. Although this study was conducted by the subcutaneous route, there is sufficient information about toldimfos to estimate the oral dose to which the subcutaneous dose roughly corresponds. The similarity in the toxicity profiles between a 28 day study by the subcutaneous route and a 90 day feeding study suggests that about 5% of toldimfos is absorbed following oral administration. This means that, as a first approximation, the 50 mg/kg dose in this study would correspond to a dose of approximately 1000 mg/kg by the oral route. For the screening purpose of the HPV program, this GLP study of toldimfos by the subcutaneous route is an adequate surrogate for study of BPA by the oral route.
Additional References for Reproductive Toxicity Studies:	Mattern et Partner GmbH. (Date not available) Toldimfos Establishment of MRLs – Safety File. Unpublished submission Babicek, K. and Hacker R. (1998) Report on the meta-analysis of pup mortality in the F2 generation in the course of the study "Toldimfos –Natrium – Two-Generation Reproduction Toxicity Study on Wistar Rats after s.c. Aministration. Unpublished report.

5.4. Genetic Toxicity:

5.4.1. *In Vitro* Gene Mutations

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
Type:	No data available
GLP:	No data available
Year:	No data available
Cell Type:	No data available

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Metabolic Activation:	No data available
Concentrations Tested:	No data available
Vehicle:	No data available
Cytotoxic Concentration:	No data available
Genotoxic Effects With Metabolic Activation:	No data available
Genotoxic Effects Without Metabolic Activation:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for In Vitro Gene Mutation Studies:	None

5.4.2. *In Vitro* Chromosome Aberrations

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
Type:	No data available
GLP:	No data available
Year:	No data available
Cell Type:	No data available
Metabolic Activation	No data available
Concentrations Tested:	No data available
Vehicle:	No data available
Cytotoxic Concentration:	No data available
Genotoxic Effects With Metabolic Activation:	No data available
Genotoxic Effects Without Metabolic Activation:	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available

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Remarks:	None
Additional References for *In Vitro* Chromosome Aberration Studies:	None

5.4.3. *In Vivo* Chromosome Aberrations

Identity:	BPA (phosphinic acid, phenyl-) CAS# 1779-48-2
Method:	No data available
Type:	No data available
GLP:	No data available
No data available Year:	No data available
Species/Strain:	No data available
Sex:	No data available
Route Of Administration:	No data available
Vehicle:	No data available
Doses Administered:	No data available
Genotoxic Effects:	No data available
NOAEL (NOEL):	No data available
LOAEL (LOEL):	No data available
Conclusions:	No data available
Reliability:	No data available
Reference:	No data available
Remarks:	None
Additional References for *In Vivo* Chromosome Aberration Studies:	None