FOREWORD INTRODUCTION

2,3-DICHLORONITROBENZENE

CAS N°: 3209-22-1

Substance

End Point	:	**IDENTIFIERS, PHYSICAL AND CHEMICAL PROPERTIES**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
Common Name	:	**2,3-Dichloronitrobenzene**
CAS Number	:	**3209-22-1**
RTECS Number	:	**CZ5240000**

Properties & Definitions

Molecular Formula	:	**C6H3Cl2NO2**
Molecular Weight	:	**192**
Melting Point	:	**61C**
Boiling Point	:	**257C**
State	:	**Solid**
Flash Point	:	**123C**
Vapour Pressure	:	**0.3 hPa**
Octanol/Water Partition Coefficient	:	**log Pow = 3.2 at 20C experimental**
Water Solubility	:	**74.1 mg/L**
Impurities	:	**Benzene, 1,2-dichloro-4-nitro-; benzene, 1,2-dichloro-2-nitro-**
General Comments	:	The chemical is stable in neutral, acidic or alkaline solutions. Non-volatile.

Overall Evaluation

NEEDS FURTHER WORK

INITIAL ASSESSMENT

1,2-Dichloro-3-nitrobenzene is non-volatile stable solid. The production volume was 12-14 tonnes/year, and import volume was 30-270 tonnes/year for 1990-1993 in Japan. In Germany, this chemical is not produced specifically, but it occurs as a by-product during synthesis of 1,2-dichloro-4-nitrobenzene. In 1988/89, 1300 tonnes/year were formed of which 200 tonnes/year were isolated and exported. This chemical is stable in neutral, acidic or alkaline solutions, and is classified as "not readily biodegradable" and "low bioaccumulation potential".

The chemical is strongly toxic to daphnids, moderately toxic to fish and slightly toxic to algae. The environmental risk presumably low because the PEC is lower than the MTC.

The chemical showed genotoxic effects in non-bacterial in vitro chromosomal aberration test using Chinese hamster CHL cells with and without metabolic activation, and NOAEL for repeated dose toxicity was 5 mg/kg/day and NOAEL for reproductive toxicity was 100 mg/kg/day.

Daily intake of the chemical was estimated as 1.58E-6 mg/day from calculation using MNSEM 145I exposure model.

ENVIRONMENTAL EXPOSURE

Biodegradability: "not readily biodegradable"

ESTIMATION OF ENVIRONMENTAL FATE, PATHWAY AND CONCENTRATION

Comparison of calculated environmental concentration using several models.

MNSEM Model:
Air: 1.57E-8 ug/L; Water: 3.39E-4 ug/L; Soil: 7.00E-4 ug/kg; Sediment: 0.0263 ug/L
CHEMCAN2 Model:
Air: 7.91E-8 ug/L; Water: 2.92E-4 ug/L; Soil: 1.28E-4 ug/kg; Sediment: 0.0205 ug/L
CHEMFRAN Model:
Air: 7.56E-11 ug/L; Water: 3.62E-3 ug/L; Soil: 3.58E-5 ug/kg; Sediment: 0.0243 ug/L

UKMODEL Model:
Air: 2.48E-7 ug/L; Water: 5.84E-6 ug/L; Soil: 2.11E-4 ug/kg; Sediment: 4.20E-4 ug/L

The emission into the atmosphere during production is negligible since the production plants are provided with thermal exhaust air purification of active carbon adsorption facilities which eliminate 1,2-dichloro-3-nitrobenzene from exhaust air. In 1988/89 emissions of this chemical into the hydrosphere was estimated to about 700 kg/year in the waste water treatment plant. As 1,2-dichloro-3-nitrobenzene is not processed further there is no emission into the atmosphere or into the hydrosphere during processing. (German Data).

Predicted Environmental Concentration (PEC) in Germany
A PEC can be calculated considering following scenario:
according to the Dutch exposure model for waste water treatment plants (DRANC) the physical and chemical elimination of chemical in local commercial sewage plants amounts to 29%. According to the American elimination model (STP) the physical and chemical elimination is 8%. No information is available on the degree of biological elimination achieved in biological waste water treatment plant. We only know that according to the OECD screening test 301E 1,2-dichloro-3-nitrobenzene proved to be non-biodegradable even after adaptation of the microoganisms in the inoculum;
the waste water effluent is directed to the river Rhine with a mean flow of 2060 m3/s and a mean low flow of 690 m3/s.

PECmean (DRANC) = 700.08/365x24x60x60x2060 = 0.86xE-8 kg.m3 = 9 ng/L

PECmean (STP) = 700x0.92/1365x24x60x60x2060 = 0.98xE-8 kg/m3 = 10 ng/L

PEClow water (DRANC) = 0.025 ug/L

PEClow water (STP) = 0.029 ug/L

CONSUMER EXPOSURE

No specific information were provided on consumer exposure. But, consumer exposure seems to be low because this chemical is used as intermediate for specific chemicals.

OCCUPATIONAL EXPOSURE

No specific information were provided on occupational exposure, and no data on work place monitoring were reported.

CONCLUSION

In conclusion, 1,2-dichloro-3-nitrobenzene is persistent and toxicological and ecotoxicological tests showed strong toxicity. Based on the genotoxicity of this chemical, we concluded that further work should be considered.

RECOMMENDATION

Although there are lack of international information on exposure, non-bacterial mutation test in vitro showed positive results and repeated dose toxicity test showed low NOEL value. Therefore, second non-bacterial mutation test in vivo is recommended as further testing according to the "OECD Provisional Guidance for Hazard Assessment of Full SIDS". However, international information gathering on exposure is recommended before testing.

Production-Trade

Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Geographic Area : **DEU**

Production

Quantity	*Year*
1300 t - P	**1988-1989**
200 t - EX	**1988-1989**

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Production-Trade

Chemical Name : **2,3-Dichloronitrobenzene**
CAS Number : **3209-22-1**
Geographic Area : **JPN**

Production

Quantity	*Year*
1000 t - P	**1985**
12 t - P	**1991**
250 t - IM	**1991**
14 t - P	**1992**
270 t - IM	**1992**
30 t - IM	**1993**

General Comments : For the year 1985 the given quantity includes both production and import.

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Processes

Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**

Process

Process comments : The chemical is synthesized by nitration of o-dichlorobenzene. Main product of this reaction is 3,4-dichloronitrobenzene and 1,2-dichloro-3-nitrobenzene is by-product of the reaction. Washing process of the plant unit of nitration, distillation, recrystallization and separation are included. Packing process of the manufactured goods is carried out by the production plant.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Uses

Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**

Use

Quantity	*Year*	*Comments*
		Intermediate reagents in the chemical industry. Antibacterial and antiprotozoal agents. Agricultural chemicals.

References

Secondary References : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **Pathway into the Environment and Environmental Fate.**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**

Test Method and Conditions

Test method description : 1) DRANC model (Dutch exposure model). 2) STP model (American elimination model). The waste water effluent is directed to the river Rhine with a mean flow of 2060 m3/s and a mean low flow of 690 m3/s.

Quantity Transported

Medium	*to Medium*		*Quantity*	*Time*	*Year*	*to Year*
	to AQ	**FRESH**	**700 kg**	**1 y**	**1988**	**to 1989**

Estimated emissions into hydrosphere in the waste water treatment plant.

to AQ **FRESH** **10.8 mg/L**

PEC mean (Predicted Environmental Concentration) calculated from DRANC model.

to AQ **FRESH** **10 mg/L**

PEC mean calculated from STP model.

to AQ **FRESH** **0.032 ug/L**

PEC low water calculated from DRANC model.

to AQ **FRESH** **0.030 ug/L**

PEC low water calculated from STP model.

General Comments : The emission into the atmosphere during production is negligible since the production plants are provided with thermal exhaust air purification of active carbon adsorption facilities which eliminate the substance from exhaust air. As 1,2-dichloro-3-nitrobenzene is not processed further there is no emission into the atmosphere or into the hydroshpere during processing.

References

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**LOSS**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**

Test Subject

Organism	*Medium*	*Specification*
	AQ	**SEW**

Test Method and Conditions

Test method description	:	1) DRANC model (Dutch exposure model). 2) STP model (American elimination model).

Test Results

Quantity		*Time*	*Comments on result*
29 %	AV		Elimination of test substance in local commercial sewage plants. Calculated from DRANC model.
8 %	AV		Elimination calculated from STP.

General Comments	:	The above values are calculated.

References

Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**CONCENTRATION**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Geographic Area	:	**JPN**

Test Subject

Organism	*Medium*	*Specification*	*Lifestage*	*Sex*
	AQ	**SURF**		
	SOIL			
	SED			

Test Results

Matrix	*Concentrations*	*Spec.*	*Date*
	0 ug/g		**1981**

Not detected in surface water in 7 areas in Japan. Detection limit: 0.03 ug/L.

	0 ug/L		**1981**

Not detected in soil and sediment in 7 areas in Japan. Detection limit: 0.0015 ug/L.

References

Primary Reference :

#MOREA*

Environmental Monitoring of Chemicals, Environmental Survey Report (Office of Health Studies, Department of Environmental Health), Japan

Secondary Reference :

!SIDSP*

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**CONCENTRATION**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Geographic Area	:	**JPN**

Test Subject

Organism	*Medium*	*Specification*	*Lifestage*	*Sex*
	AIR			
	AQ			
	SOIL			

Test Method and Conditions

Test method description :

Multi-Phase Non-Steady State Equilibrium Model for Evaluation of Fate of Chemicals in Environment Consisting of Air, Water, Soil and Sediment Phases. Version 1.4.5I. Also called MNSEM 145I. (Presented by Kikuo Yoshida).

Test Results

Matrix	*Concentrations*	*Spec.*	*Date*
	1.57E-11 mg/L		
	In air. 1.99E-9 ppm also reported. Steady state mass = 3.13E-1 g.		
	3.39E-7 mg/L		
	In water. Steady state mass = 6.77E+3 g.		
	7.00E-7 mg/kg		
	In soil. Steady state mass = 1.12E+3 g.		
	2.63E-5 mg/kg		
	In sediment. Steady state mass = 2.63E+3 g.		

General Comments : All values are estimated. Clearing time 56 days. No precision given on media.

References

Primary Reference : **#URMEA***
Unpublished Report on Exposure Estimation Test conducted by MITI and Environmental Agency, Japan

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **CONCENTRATION**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro**
CAS Number : **3209-22-1**
Geographic Area : **JPN**

Test Subject

Organism	*Medium*	*Specification*	*Lifestage*	*Sex*
	FOOD			
	FOOD			
	PLANT			

Test Results

Matrix	Concentrations	Spec.	Date
In meat	**1.51E-10 mg/L**		
In Milk	**1.07E-10 mg/L**		
In vegetation	**1.01E-7 mg/L**		

General Comments : All values are estimated.

References

Primary Reference :

#URMEA*

Unpublished Report on Exposure Estimation Test conducted by MITI and Environmental Agency, Japan

Secondary Reference :

!SIDSP*

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**HUMAN INTAKE AND EXPOSURE**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*
HUMAN					

Test Method and Conditions

Test method description : Multi-Phase Non-Steady State, Equilibrium Model for Evaluation of Fate of Chemicals in Environment consisting of Air, Water, Soil and Sediment Phases. Version 1.4.5I. Also called MNSEM 145I. (Presented by Kikuo Yoshida).

Test Results

Intake	*Spec.*	*Date*
3.13E-7 mg/d Through inhalation of air		
6.77E-7 mg/d Through drinking water		
5.51E-7 mg/d Through ingestion of fish		
1.12E-11 mg/d Through ingestion of meat		
1.30E-11 mg/d Through ingestion of milk		
3.79E-8 mg/d Through ingestion of vegetables		
1.58E-6 mg/d Total exposure dose		

General Comments : Consumer exposure seems to be low because this chemical is used as intermediate for specific chemicals.

References

Primary Reference : **#URMEA***
Unpublished Report on Exposure Estimation Test conducted by MITI and Environmental Agency, Japan

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Study type	:	**LAB**
Species/strain/system	:	Activated sludge

Test Substance

Purity Grade	:	**99.4%**

Test Method and Conditions

Test method description	:	OECD Guideline 301C. The sludge samples were mixed by stirring in a single container and then cultured at 25C for 1 month. GLP: yes
Temperature	:	**25 C**
(An)aerobic	:	**AEROB**

Exposure

Exposure Period	:	**1 mo**

Test Results

Quantity		*Time*	*Comments on result*
0 %	AV	**1 mo**	Degree of biodegradation from BOD7
4 %	AV	**1 mo**	Degree of biodegradation from BOD14
4 %		**1 mo**	Degree of biodegradation from BOD28
5 %		**1 mo**	Degree of biodegradation from HPLC (high pressure liquid chromatography)

General Comments : These results indicate that this chemical should be classified as "not readily biodegradable".

References

Primary Reference : **#MCIBD***

Unpublished Report on Biodegradation Test of (specific chemical) conducted by MITI

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**PHOTODEGRADATION**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**

Test Substance

Purity Grade	:	**99.4%**

Test Method and Conditions

Test method description	:	Handbook of Chemical Properties Estimation Method. W. J. Lyman et al. (McGraw Hill Book Co., 1981). GLP: no

Exposure

Exposure Period	:	**36 d**
Dose / Concentration	:	**9.6E-3 mg/L**

Test Results

Quantity		*Time*	*Comments on result*
50 %	LOSS	**36 d**	Estimated half-life.

General Comments : Results are estimated values. Photochemical degradation rate 1.l2E-11 mol/L/s. Depth in the water body 500 cm. Conversion constant 6.023E+20. Quantum yield for disappearance of chemical by photolysis under solar irradiation 0.01.

References

Primary Reference : **#MCITH***

Unpublished Report on Hydrolysis and Photodegradation Test of (specific chemical), HPV/SIDS test conducted by MITI

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**HYDROLYSIS**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Study type	:	**LAB**

Test Substance

Purity Grade	:	**99.4%**

Test Method and Conditions

Test method description	:	OECD Guideline 111. Hydrolysis as a function to pH (estimated). GLP: yes
Temperature	:	**25 C**
pH	:	**4.0-9.0**

Test Results

Quantity		*Time*	*Comments on result*
50 %	LOSS	**>1 y**	Half-life in pH 4.0, 7.0 and 9.0 at 25C.

General Comments : The substance is hydrolitically stable.

References

Primary Reference : **#MCITH***

Unpublished Report on Hydrolysis and Photodegradation Test of (specific chemical), HPV/SIDS test conducted by MITI

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**BIOCONCENTRATION**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Study type	:	**LAB**

Test Substance

Purity Grade	:	**99.4%**

Test Method and Conditions

Test method description	:	OECD Guideline 305C. GLP: yes

Test Results

Organ	*Bioconcent. Factor*	*Calc Basis*	*Time*	*State*	*Comments on result*
	<1				Log BCF, level 1 exposure
	1				Log BCF, level 2 exposure

References

Primary Reference	:	**#MCITH*** Unpublished Report on Hydrolysis and Photodegradation Test of (specific chemical), HPV/SIDS test conducted by MITI
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**MAMMALIAN ACUTE TOXICITY**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro**
CAS Number	:	**3209-22-1**
Species/strain/system	:	Rat, Crj:CD(SD)

Test Method and Conditions

Test method description	:	OECD Test Guideline 401; GLP: yes

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
RAT			**ORL**	**ADULT**		**LD50**	For male rats was estimated as 381 mg/kg and for female rats as 512 mg/kg.

References

Primary Reference	:	**#MHAAB*** Unpublished Report on Acute Toxicity Screening Test of (specific chemical)-HPV/SIDS, test conducted by MHW, (1992)
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**	**ADULT**	**M**	**10/GROUP**	**10**
					F	**10/GROUP**	**10**

Species/strain/system : Rat, Crj:CD(SD)

Test Substance

Purity Grade : **99.15**
Vehicle - Solvent : Olive oil

Test Method and Conditions

Test method description : OECD Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test. GLP: yes

Exposure

Exposure Type : **SHORT**
Dose / Concentration : **1-100 mg/kg**
Exposure comments : Doses of 0, 1, 5, 25 and 100 mg/kg/day were administered in oral gavage during 42 days to male rats and from 14 days before mating through day 3 of lactation to female rats.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
	NEF				

Parental animals receiving 1 or 5 mg/kg/day exhibited no symptoms relating to test substance. NOAEL was established at 5 mg/kg/day dose level. Results applied to both female and male rats.

LIVER	**STRUC**		**M**
KIDNY	**STRUC**		

Male rats receiving 25 mg/kg/day showed evidence of hepatocellular swelling and hyaline droplets in the renal convoluted tubular epithelium.

LIVER	**SIZE**
KIDNY	**SIZE**

In the groups receiving 25 mg/kg/day weights of these organs were increased.

SPLN	**CHNG**

Hemosiderosis occurred in the groups receiving 25 mg/kg/day.

KIDNY
TYMUS

In the dose groups of 100 mg/kg/day there was an overt regenerative process in the renal tubules and increased incidence of atrophic thymus.

BLOOD BIOCH

Increased levels of serum sodium, total protein, total cholestrol; decreased levels of blood urea nitrogen were observed in 100 mg/kg/day dose group. There was also decrease of hemoglobin and hematocrit values.

URINE BIOCH

Elevations of urine protein levels were observed in 100 mg/kg/day dose group.

BLOOD CHANG

There was an evidence of hemolytic anemia in 100 mg/kg/day dose group.

General Comments : In all dosed animals there was no meaningful change of general conditions and no fatal case occurred. The food consumption of 100 mg/kg/day animals decreased on the first day of treatment but showed no significant difference thereafter. There was a decrease in body weight gain.

References

Primary Reference : **#MHRAB***
Unpublished Report on Combined Repeat Dose and Reproductive Developmental Toxicity Screening Test of (specific chemical)-HPV/SIDS test conducted by MHW, (1992)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 13-14, (1994)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
BACT			**VTR**				

Species/strain/system : Salmonella typhimurium, strains: TA98, TA100, TA1535, TA1538

Test Method and Conditions

Test method description : Preincubation

Exposure

Exposure Type : **SHORT**
Exposure comments : All strains were incubated with and without metabolic activation.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
	MUT				

Strain TA100 showed questionable evidence of mutagenic effect in cultures without metabolic activation.

General Comments : The test substance was calssified as "negative" in bacterial mutagenicity test in vitro under conditions used.

References

Primary Reference : **ENMUDM**
Haworth, S. et al. Environmental Mutagenesis, 5(1), 3-142, (1983)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
BACT			**VTR**				

Species/strain/system : Salmonella typhimurium, strains: TA98, TA100, TA1535, TA1537, TA1538

Test Method and Conditions

Test method description : preincubation (pour-plate assay).

Exposure

Exposure Type : **SHORT**

Test Results

Organ	Effect	Rev.	OnSet	Sex	Affected in Exposed - Controls
	NEF				

There was no genotoxic effect in all the strains incubated with and without metabolic activation.

General Comments : The test substance was classified as "negatve" in bacterial mutagenicity test in vitro under conditions used.

References

Primary Reference : **MUREAV**
Shimizu, M. et al. Mutation Research(116), 217, (1983)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	Medium	Specification	Route	Lifestage	Sex	Number exposed	Number controls
HAMST			**VTR**				

Species/strain/system : Chinese hamster CHL cells

Test Substance

Purity Grade : **99.15**
Vehicle - Solvent : DMSO

Test Method and Conditions

Test method description : Chromosomal aberration test; Japanese Guideline for Screening Mutagenicity Testing of Chemicals. GLP: yes

Exposure

Exposure Type : **SHORT**
Exposure comments : Cells were incubated (2 plates/test) with and without metabolic activation by S9. Doses for -S9: 0, 0.3, 0.6, 0.12 mg/mL; for +S9: 0, 0.024, 0.049, 0.09 mg/mL. Positive control: -S9 with mitomycin C. Positive control: +S9 with cyclophosphamide.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
	MUT				

All treated cultures with and without metabolic activation showed mutagenic effects of the test substance under test condition.

General Comments : The test substance was classified as "positive" in chromosomal aberration test in vitro under conditions used.

References

Primary Reference : **#MOMHW***
Chemical Report submitted by the Ministry of Health and Welfare, Japan, (1992)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
INSEC							

Species/strain/system : Drosophila melanogaster

Test Substance

Purity Grade : **99%**

Test Method and Conditions

Test method description : Sex-linked recessive lethal test (NTP).

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
	NEF				

No mutagenic effects were observed under the test conditions.

References

Primary Reference : **ENMUDM**
Yoon, J. S. et al. Environmental Mutagenesis, 7, 349, (1985)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **REPRODUCTION**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**		**F**	**10**	**10**
					M	**10**	**10**

Species/strain/system : Rat, Crj:CD(SD)

Test Substance

Purity Grade : **99.15**
Vehicle - Solvent : Olive oil

Test Method and Conditions

Test method description : OECD Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test.

Exposure

Exposure Type : **SHORT**
Exposure Period : **42 DAY**
Frequency : **X1 DAY**
Dose / Concentration : **1-100 mg/kg/ day**
Exposure comments : Doses of: 0, 1, 5, 25 and 100 mg/kg/day were administered in oral gavage during 42 days to male rats and from 14 days before mating through day 3 of lactation to female rats.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
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NEF

No toxic effect on reproduction was observed.

NOAEL

No adverse effect level for parental generation was 100 mg/kg/day (the highest dose tested).

References

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **TERATOGENICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**		**F** **M**		

Species/strain/system : Rat, Crj:CD(SD)

Test Substance

Purity Grade : **99.15**

Test Method and Conditions

Test method description : OECD Combined Repeat Dose and Reproductive/Developmental Toxicity Screening Test. GLP: yes

Exposure

Exposure Type : **SHORT**
Exposure comments : Maternal doses of: 0, 1, 5, 25 and 100 mg/kg/day in oral gavage throughout the uterine development plus 3 days were tested for the teratogenic effect of the chemical.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
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NEF

No teratogenic effects were observed.

NOAEL

No adverse effect level for F1 generation was 100 mg/kg/day of maternal exposure (the highest dose tested).

General Comments : The parental females, at doses above 25 mg/kg, also exhibited the pathological changes of the liver, kidney and spleen. The change of female kidneys was characterized by vacuolated tubular epithelium.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point	:	**AQUATIC ACUTE TOXICITY**
Chemical Name	:	**Benzene, 1,2-dichloro-3-nitro-**
CAS Number	:	**3209-22-1**
Species/strain/system	:	Gruppy (Poecilia reticulata)
Exposure Period	:	**14 d**
Dose / Concentration	:	**4.5 mg/L**

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
FISH	**AQ**	**FRESH**				**LC50**	LC50 = 4.516 mg/L (reported as ppm). The value 1.34 umol/L also reported.

References

Primary Reference : **AQTODG**
Deneer, J. W. et al. Aquatic Toxicology, 10, 115-129, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Species/strain/system : Orange-red Killifish (Oryzias latipes)

Test Substance

Purity Grade : **99%**

Test Method and Conditions

Test method description : OECD Guideline. Semi-static test. GLP: no

Exposure

Exposure Period : **24-96 h**
Exposure comments : Doses were also tested for 48 and 72 hours.

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*

LC0

LC0 for 24, 48, 72 and 96 hours = 6 mg/L (w/v). (Reported as ppm (w/v)).

LC50

LC50 for 24 hours = 11.3 mg/L (w/v), for 48 hours = 8.6 mg/L (w/v). (All results reported as ppm (w/v)).

LC100

LC100 for 24, 48, 72 and 96 hours = 18 mg/L (w/v). (Reported as ppm (w/v)).

References

Primary Reference : **#EAFGP***
Unpublished Report on Toxicity to Fish-HPV/SIDS test conducted by the EA

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
ALGAE	**AQ**	**FRESH**					

Species/strain/system : Algae (Selenastrum capricormutum)

Test Substance

Purity Grade : **>99%**

Test Method and Conditions

Test method description : OECD Guideline. GLP: no

Exposure

Exposure Type : **ACUTE**
Exposure Period : **72 h**

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
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	EC50				

EC50 for 72 hours = 15 mg/L (w/v). (Reported as EbC = 15 ppm (w/v)).

References

Primary Reference : **#EAATU***
Unpublished Report on Toxicity of (specific chemical) to Algae- HPV/SIDS test conducted by EA

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
CRUS	**AQ**	**FRESH**					

Species/strain/system : Water flea (Daphnia magna)

Test Substance

Purity Grade : **>99%**
Vehicle - Solvent : (DMSO: HCO-40 = 9:1)

Test Method and Conditions

Test method description : OECD Guideline. GLP: no. Method used to calculate values: Probit method.

Exposure

Exposure Type : **ACUTE**

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
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EC0

EC0 for 24 hours = 1.8 mg/L (w/v). (Reported as ppm (w/v)).

EC50

EC50 for 24 hours = 5 mg/L (w/v). (Reported as ppm (w/v)).

EC100

EC100 for 24 hours = 10 mg/L (w/v). (Reported as ppm (w/v)).

References

Primary Reference : **#EADGP***
Unpublished Report on Toxicity of (specific chemical) to Daphnids-HPV/SIDS test conducted by EA

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Benzene, 1,2-dichloro-3-nitro-**
CAS Number : **3209-22-1**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
CRUS	**AQ**	**FRESH**					

Species/strain/system : Water flea (Daphnia magna)

Test Substance

Purity Grade : **>99%**
Vehicle - Solvent : (DMSO: HCO-40 = 9:1)

Test Method and Conditions

Test method description : OECD Guideline. Static test. GLP: no

Exposure

Exposure Type : **LONG**
Exposure Period : **21 d**

Test Results

Organ	*Effect*	*Rev.*	*OnSet*	*Sex*	*Affected in Exposed - Controls*
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NOEL

No observed effect concentration (maximum) for 21 days: < 0.06 mg/L (w/v). (Reported as ppm w/v).

LOEL

First (lowest) observed effect concentration (minimum) for 21 days = 0.06 mg/L (w/v). (Reported as ppm w/v).

References

Primary Reference : **#EADGP***
Unpublished Report on Toxicity of (specific chemical) to Daphnids-HPV/SIDS test conducted by EA

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1994)