FOREWORD INTRODUCTION

AMINOTRI(METHYLENEPHOSPHONIC ACID)

CAS N°: 6419-19-8

Substance

End Point	:	**IDENTIFIERS, PHYSICAL AND CHEMICAL PROPERTIES**
Chemical Name	:	**Phosphonic acid, (nitrilotris(methylene))tris-**
Common Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
RTECS Number	:	**SZ9860000**

Synonyms

Aminotri(methylphosphonic acid)
Aminotris(methanephosphonic acid)
Aminotris(methylphosphonic acid)
ATMP
Briquest 301-500
Budex 5130
Dequest 2000
Dequest 2001
Dowell L 37
Ferrofos 509
Masquol P 320
Mayoquest 1320
Nitrilotrimethanephosphonic acid
Nitrilotrimethylphosphonic acid
Nitrilotris(methylphosphonic acid)
NTF
NTMP
NTPA
Sequion 20H45
Sequion OA
Tris(phosphonomethyl)amine
Turpinal MD2

Properties & Definitions

Molecular Formula	:	**C3H12NO9P3**
Molecular Weight	:	**299.07**
Melting Point	:	**-14C**
Boiling Point	:	**105C**
State	:	**Liquid**
Flamable Limit	:	**Not regarded as flammable**
Density	:	**1.33 at 20C**
Vapour Pressure	:	**0.1kPa(10E-7mmHg) at 20C CAL.**
Octanol/Water Partition Coefficient	:	**log Pow = -3.53**
Water Solubility	:	**610g/l at 25C (very soluble)**
Surface Tension	:	**0.073 Newton/m**
Impurities	:	**5% w/w N-methyl nitrolobis(methylene phosphonic acid); 5% w/w phosphorus acid; 4% hydroxymethyl phosphonic acid; 1% w/w aminomethylene phosphonic acid. 1% w/w orthophosphoric acid**
General Comments	:	Product is sold as aqueous solution,containing 50% w/w or less of the active acid at pH<2 (acid solution) and pH neutral (sodium salt solution). Decomposition takes place at 200-250C. Will give off phosphine, if heated above 200C, which is toxic and flammable gas.

Overall Evaluation

SIDS INITIAL ASSESSMENT

This chemical is presently of low concern.

There is needs for further work.

SHORT SUMMARY OF THE REASONS WHICH SUPPORT THE RECOMMENDATION

The maximum tolerable concentration is three to four orders of magnitude higher than the predicted environmental concentrations of ATMP in water. ATMP is readily adsorbed to sediment, however there is little evidence of repartitioning, therefore the bioavailability to sediment-dwelling organisms would appear to be low. In conclusion, ATMP represents little risk to the environment. The substance is not acutely toxic, nor, from the experimental evidence does it have mutagenic, teratogenic or carcinogenic properties.

Under the predicted conditions of use the chemical is very unlikely to present a risk to health.

More information is needed on the mode and frequency of use of the substance and formulations containing it in particular, the potential for aerosol formation should be addressed.

Production-Trade

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Geographic Area : **USA**

Production

Quantity	*Year*
3820 T - P	**1989**
700 T - EXP	**1989**

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Production-Trade

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Geographic Area : **EUR**

Production

Quantity	*Year*
3360 T - P	

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Production-Trade

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Geographic Area : **WORLD**
General Comments : ATMP production levels worldwide are in the range of 1000 to10000 tonnes per annum.

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Processes

Chemical Name : **Aminotri(methylenephosphonic acid)**

CAS Number : **6419-19-8**

Process

Process comments : The product is manufactured in closed reaction vessels, typically as a 50% solution of the free acid. Its is packed directly from the reaction vessel into polyethylene drums or bulk tankers for shipment to the customer.

References

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Uses

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Use

Quantity	*Year*	*Comments*
		The product as manufactured (50% solution) is used exclusively for industrial applications or for formulation.
80 %		Used as an anti-scaling agent in industrial water cooling.
10 %		Used as an anti-scaling agent in industrial boilers
10 %		Used as an anti-scaling or bleach stabilisation agent in formulation into cleaners (industrial and institutional: I & I). In I & I cleaners the concentration is typically at the 0.2-0.5% range. The product is used typically at the 1-5mg/l range. For the first two uses the product is either used as such or reformulated by specialist water treatment companies for specific application purposes.

References

Secondary References : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **Pathway into the Environment and Environmental Fate.**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Method and Conditions

Test method description : Calculation of compartment concentrations based on known experimentally derived factors on a worst case basis taking into account dilution, partition to sediments and sewage treatment.

Pathway and Transport

Pathway : **MANUF SPILL**
Pathway description : Disposal to river water from cooling tower and other uses. Disposal via sewage treatment works for closed systems.

Quantity Transported

Medium	*to Medium*	*Quantity*	*Time*	*Year*	*to Year*
Water	**to AQ**	**0.5 %**			
Sewage sludge	**to SEW**	**22.5 %**			
River sediments	**to SED**	**77 %**			

General Comments : The potential sources of release and hence exposure arise from manufacture (flushing of systems between production runs) spillage during packaging or bulk transfer, spillage during formulation or in dosing of industrial cooling systems, arising from use in I & I cleaners, or, following use, as a result of discharge of cooling or boiler water. There is not thought to be a significant general consumer use.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **LOSS**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : Biological degradation is slow in the presence of excess phosphate; however, several microorganisms can grow on phosphonates as their sole carbon and phosphorus source. High removal rates have been observed in activated sludge treatment mostly due to adsorption to sludge. Slow to moderate biodegradation rates occur in natural sediment/water and soil systems. The binding of ATMP to sediments is very strong. In microcosm studies very little ATMP could be recovered even with severe extraction methods. Photolysis of ATMP is rapid in the presence of ferric ions.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **LOSS**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Subject

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

Test Results

General Comments : A two month study by Monsanto showed no indication of ATMP degradation in a laboratory sewage treatment system as monitored by chelant titre and orthophosphonate measurement. However, phosphonate levels up to 160mg/l had no inhibitory effect on COD or MBAS removal in the test units. Biodegradattion of radiolabelled phosphonates, including ATMP, at 5mg/l in SCAS systems resulted in 0.5% to 10.2% being converted to CO2 during the 210 day test. The authors attributed the degradation to either minor impurities or slow photolysis followed by biodegradation.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **LOSS**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Subject

Organism	*Medium*	*Specification*
	AQ	

Species/strain/system : Meramec river water

Test Substance

Description of the test substance : Radiolabelled ATMP

Test Method and Conditions

Test method description : River die-away test

Test Results

Quantity	*Time*	*Comments on result*
6 %	**60 d**	When biological activity was inhibited.
12.3-13.6 %	**60 d**	In active natural water, (14)CO2 evolution was 12.3% in the dark and 13.6% in the light.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**LOSS**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Subject

Organism	*Medium*	*Specification*
	SLUDG	

Species/strain/system : Activated sewage sludge inoculum

Test Method and Conditions

Test method description	:	OECD Guideline 302A. Inherent biodegradability: modified SCAS test.
pH	:	**7**
(An)aerobic	:	**AEROB**

Test Results

Quantity		*Time*	*Comments on result*
90 %	LOSS	**26 d**	With pH buffered at approx. 7.0.
			Without pH buffering only moderate removal.

General Comments : The authors used DOC as the measure of removal and could not, therefore, distinguish between adsorption and biodegradation.

References

Primary Reference : **VJWWAU**
Horstmann, B. and Grohmann, A. Vom Wasser, 70, 163-178, (1988)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **CONCENTRATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Subject

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

Test Method and Conditions

Test method description : Mackay level 3 fugacity model.

Test Results

Matrix	*Concentrations*	*Spec.*	*Date*
AQ	**0.14 ug/l**		
Predicted concentration for water (calculated value)			
SED	**14 ug/kg**		
Predicted concentration for sediment (calculated value)			

General Comments : It was noted that this type of chemical is not the kind for which this modelling approach was developed and sorption behaviour will probably depend on the nature of metals and charged species present in sediments. Therefore, the results must be treated with caution. Modelling using the DRANC and SAMS models reveals environmental water concentrations much higher than those found by either Procter and Gamble or the Mackay model. This is because both models are heavily dependent on the relationship between water solubility and octanol water partition coefficient and do not take into account the relatively high sorption coefficient of ATMP and, therefore, its high affinity for sediment and soil. For this type of chemical, the model output gives misleading estimates of distribution and assumes that it will remain in solution. No adsorption is predicted. Therefore, neither model is suitable for estimating the environmental concentrations of chelating agents such as ATMP.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**CONCENTRATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**

Test Subject

Organism	*Medium*	*Specification*	*Lifestage*	*Sex*
	AQ			

Test Method and Conditions

Test method description : Procter and Gamble, unpublished modelling.

Test Results

Matrix	*Concentrations*	*Spec.*	*Date*
AQ	**2.5 ug/l**		

Predicted average phosphonate level for surface water

0.170-0.235 mg/l

Predicted maximum raw sewage level based on annual detergent use of 6300T.

<30 ug/l

Predicted maximum phosphonate levels < 0.03mg/l as predicted average effluent levels: 0.09-0.235mg/l, decresing by an order of magnitude upon dilution in receivin g waters.

0.25 ug/l

Predicted average environmental levels if taken into account the partitioning to sediments and limited photo and biodegradation.

General Comments : The above values are all calculated. There are no measured environmental levels of ATMP because of the lack of suitable analytical methods. Therefore, it is necessary to use modelled data. However, the results from fate models must be treated with caution because of the chelating properties of ATMP.

References

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **HUMAN INTAKE AND EXPOSURE**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text :

Human exposure via the environment: A prediction by the manufacturer based upon an annual detergent use of 6300 tonnes predicted average environmental levels in water of 0.25ug/l. Although it is likely that water treatment (or simply passage through soil) would remove the substance from solution it will be assumed that this is a worst case concentration in drinking water. Assuming a consumption of 8 litres of water per day, a (conservative) consumption of 2.0ug/day will be assumed, taking account of drinking and food preparation water. The extent to which this enters the food chain is unknown although the lack of bioaccumulation potential suggest that this would be very small. The substance's chelating power indicates that it would readily absorb to soil and thus is unlikely to result in a significant human exposure via agricultural produce or other food sources.

References

Secondary Reference : **!SIDSP***

Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **HUMAN INTAKE AND EXPOSURE**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text :

Consumer exposure: There are no consumer exposure measurements available. Consumers may be exposed following use in domestic cleaning agent. Since the formulation(s) of the cleaning agent(s) are unknown the likely levels of consumer exposure are difficult to quantify. However, an industrial cleaning product is reported to contain 0.5% of the substance. This value will be used for subsequent calculations of consumer and certain occupational exposures. Consumer exposure is very unlikely to arise from evaporation. Depending upon the mode of application, consumer exposure may occur following the formation of aerosols (leading to dermal and inhalation exposure) or from dermal exposure to the liquid. There is no information available on the exact mode of application (and hence the likelihood of aerosol formation) but as a minimum, some dermal contact with a liquid cleaner can be assumed. While ingestion is a reasonably foreseeable misuse, this has not been included in the assessment .

References

Secondary Reference : **!SIDSP***

Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**HUMAN INTAKE AND EXPOSURE**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**

Test Subject

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

HUMAN

Test Method and Conditions

Test method description	:	Estimated data.

Test Results

General Comments	:	Human exposures individually and in combination: The potential exposure from environmental routes is small, of the order of micrograms per day. This is much smaller than the predicted doses below and will be ignored for the purposes of subsequent calculations. The potential exposure from consumer use is greater, of the order of 0.02mg/kg/day. The occupational exposure is potentially the largest, of the order of 0.52mg/kg/day for 240 working days.

References

Secondary Reference	:	**!SIDSP*** Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**HUMAN INTAKE AND EXPOSURE**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**

Test Subject

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

HUMAN

Test Results

General Comments	:	Occupational exposure: There are no occupational exposure measurements available. The most likely sources of occupational exposure are: dermal exposure via splashing in manufacture, trans-shipment or use. The material supplied to formulators or directly for use is a 50% solution of the substance (more dilute solutions are available, including a neutral 30% solution of the sodium salt) but for the purposes of exposure calculation, it will be assumed that a 50% solution is used. Dermal exposure is via contact with industrial cleaning fluids, which are predicted to contain 0.5% of the substance. Exposure via the oral or inhalatory route is unlikely. Accident scenarios could be devised in which such exposures were possible, but these will be ignored for the purposes of this assessment.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **HUMAN INTAKE AND EXPOSURE**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Subject

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

Species/strain/system : ATMP formulation

Test Method and Conditions

Test method description : Dermal model for skin contact. The parameters used were: a concentration in formulation of 0.5%, default skin exposure of 795cm2/exposure event, a daily cleaning regime of 365 events per year.

Test Results

Intake	*Spec.*	*Date*
510 mg	**/y**	

Small variations in concentration, 0.4% and 0.6% vary this dose between approximately 400 and 600mg/year respectively.

1.5 mg	**/d**	

Estimation assuming a use body weight of 70kg, the dose rate is 0.02mg/kg/day.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Subject

Organism	*Medium*	*Specification*
	SLUDG	

Species/strain/system	:	Activated sewage sludge medium

Test Substance

Description of the test substance	:	Sodium aminotri(methylene phosphonate) 32% w/w expressed as acid.

Test Method and Conditions

Test method description	:	OECD Guideline 301E. Ready biodegradability. Modified OECD screening test. GLP: YES
(An)aerobic	:	**AEROB**

Exposure

Exposure Period	:	**28 d**

Test Results

Quantity	*Time*	*Comments on result*
	28 d	No appreciable reduction in DOC levels.
97 %	**28 d**	Bioelimination of standard reference material: sodium benzoate

General Comments	:	Not readily biodegradable.

References

Primary Reference	:	**#AWLTD*** Albright and Wilson Ltd, Internal Report, 452/84806, (1984)
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Subject

Organism	*Medium*	*Specification*
	SLUDG	

Species/strain/system : Activated sewage sludge medium

Test Method and Conditions

Test method description : OECD Guideline 301E. Ready biodegradability. Modified OECD screening test.

(An)aerobic : **AEROB**

Exposure

Exposure Period : **28 d**

Test Results

Quantity		*Time*	*Comments on result*
20 %	LOSS	**4 wk**	Degradation measured as 14-CO2 evolution from 14C-labelled ATMP (70ug/l)

References

Primary Reference : **CMSHAF**
Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 16(6), 1323-37, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**

Test Results

General Comments : In spite of its low aerobic and anaerobic biodegradability ATMP has been shown to be quantitatively decomposed in a number of natural and synthetic waters. The primary products formed are iminodi (methylenephosphonate); (IDMP) and the biodegradable hydroxymethylene phosphonate (HMP). Furthermore, IDMP is abiotically degraded yielding HMP and aminomethylene phosphonate (AMP). AMP is biodegradable under certain environmental conditions.

References

Primary Reference : **CMSHAF**
Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 16(6), 1323-37, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **BIODEGRADATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : Numerous studies have shown little, if any, primary or ultimate biodegradation of ATMP in tests such as OECD screening test, BOD20 test, Sapromat test and closed bottle test (Huber, 1975; Steber and Wierich, 1987; Horstmann and Grohmann, 1988; Schoberl and Huber, 1988). Degradation or removal seen in laboratory tests has been attributed to adsorption or photolysis.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **BIODEGRADATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Method and Conditions

Test method description : Anaerobic degradation in a model digester.

Test Results

Quantity	Time	Comments on result
2 %		Radioactive CO2 and CH4

General Comments : ATMP had no detrimental effect on digester gas evolution at concentrations up to 100mg/l.

References

Primary Reference : **CMSHAF**
Steber, J. and Wierech, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 1, 1323-37, (1987)

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **BIODEGRADATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	Medium	Specification
AQ		

Species/strain/system : Water

Test Method and Conditions

Test method description : OECD Guideline 301B. Ready biodegradability: Modified Sturm test.

(An)aerobic : **AEROB**

Test Results

Quantity	Time	Comments on result
<10 %	LOSS	Biodegradation

References

Primary Reference : **TSDTAZ**
Schdoerl, P. and Huber, L. Tenside Detergents, 25, 99-107, (1988)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Subject

Organism	*Medium*	*Specification*
AQ		

Species/strain/system : Water

Test Method and Conditions

Test method description : OECD Guideline 302B. Inherent biodegradibility: Modified Zahn-Wellens test.

(An)aerobic : **AEROB**

Exposure

Exposure Period : **28 d**

Test Results

Quantity		*Time*	*Comments on result*
23 %	LOSS	**28 d**	DOC removal

References

Primary Reference : **CMSHAF**
Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 16(6), 1327-37, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme(4.1), (1993)

Study

End Point : **BIODEGRADATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*
AQ		
SOIL		
SEW		

Species/strain/system : Water; Soil; Sewage treatment

Test Method and Conditions

Test method description : OECD Guideline 301E. Screening test. Confirmatory test. GLP: NO

Test Results

Quantity		*Time*	*Comments on result*
7-20 %	LOSS		BOD/COD in closed bottle test. Screening test.
2.5-38 %	LOSS		BOD/COD after addition of pre-acclimated activated sludge. Screening test.
2 %			Mineralization in loamy soil after 10 weeks incubation.
32 %			Mineralization in Lufa loamy soil after 10 weeks incubation.
53 %			Mineralization in silt loam after 10 weeks incubation.
			No negative influence in sewage treatment. Confirmatory test

General Comments : Although phosphonates in general are not readily degraded in these standard tests, there are a number of other mechanisms by which they are removed. A number of bacteria have been found which can break C-P bonds with the production of orthophosphate. These results are also published in Applied Environmental Microbiology, p.p. 895-903, April 1990.

References

Primary Reference : **CMSHAF**
Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 16(6), 1323-37, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme(4.1), (1993)

Study

End Point	:	**BIODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Subject

Organism	*Medium*	*Specification*
SOIL		

Species/strain/system : Soil. 3 stantdards used: Spodosol; Lufa 3; Alfisol

Test Method and Conditions

(An)aerobic : **AEROB**

Exposure

Exposure Period : **10 wk**

Test Results

Quantity		*Time*	*Comments on result*
2 %	LOSS	**10 wk**	Degradation in Spodosol
32 %	LOSS	**10 wk**	Degradation in Lufa 3
53 %	LOSS	**10 wk**	Degradation in Alfisol

Freundlich isotherm constant in different soils was between 32 - 237. Thus according to the EPA classification, substances with 10<K<1000 as only of low mobility in soils.

General Comments : Extensive mineralisation of most phosphonates except ATMP have been reported by Monsanto (unpublished studies). Radiolabelled studies indicate that mineralisation rates are a function of soil type. 10ppm of 14C-labelled ATMP added to various soil types resulted in the production of radiolabelled CO2 of between 0.6 and 14.6% over 119-148 days. Schowanak, D. & Verstraete, W. (1989). App. Environ. Microbiol. (In Press) have demonstrated the existence of bacteria capable of cleaving the C-P bond at relatively high phosphonate concentrations (10-100ppm) in soils.

References

Primary Reference : **CMSHAF**
Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems, 16(6), 1323-37, (1987)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme(4.1), (1993)

Study

End Point	:	**PHOTODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Results

General Comments	:	Photolysis during exposure to sunlight when in water or in soils with fission of the C-P bond to give ortho phosphate and similar bacterial fission in soil will be the main modes of degradation once the product reaches the environment.

References

Primary Reference	:	**AEMIDF** Applied and Environmental Microbiology, 56, 1293-96, (1990)
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**PHOTODEGRADATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**

Test Substance

Description of the test substance	:	Dequest 2000 acid in water

Test Method and Conditions

Test method description	:	Monsanto test - photodegradation in presence of ferric ion. Similar to ASTM Draft for proposed Standard for aqueous photolysis test. GLP:YES

Exposure

Dose / Concentration	:	**0.2-0.3 mg/l**
Dose / Concentration	:	Exposure to sunlight

Test Results

Quantity		*Time*	*Comments on result*
4-6 %	LOSS	**4 h**	After exposure to sunlight. Product: converted to ortho phosphate. From an earlier experiment it was suggested that ferric ion concentration strongly increases the degree of degradation.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point	:	**HYDROLYSIS**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Species/strain/system	:	Aqueous mineral medium containing radiolabelled ATMP

Test Substance

Description of the test substance	:	ATMP

Test Method and Conditions

Test method description	:	Abiotic degradation. Incubation in the dark for 2 weeks in Verse water or artificial nutrient solution.

Exposure

Exposure Period	:	**14 d**
Dose / Concentration	:	**10 mg/l**
Dose / Concentration	:	Incubation in dark.

Test Results

Quantity		*Time*	*Comments on result*
70 %	LOSS	**14 d**	The organic P had been mineralized. No ATMP detected analytically.

General Comments : Analysis of 14-C labelled compounds after 9 days incubation period showed complete degradation of ATMP even under sterile conditions, thus proving that the first step of ATMP decomposition is abiotic. In the absence of bacteria iminodi(methylenephosphonic acid) (IDMP) represented the most prominent degradation product after 1 week. In the course of incubation it was abiotically - further decomposed forming HMP and AMP. Since IDMP decrease was considerably slower in sterile assays, existence of an additional bacterial mechanism of IDMP degradation may be possible.

References

Primary Reference : **CMSHAF**

Steber, J. and Wierich, P. Chemosphere. Chemistry, Biology and Toxicology as related to Environmental Problems(6), 1323-37, (1987)

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point	:	**HYDROLYSIS**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Medium	:	**AQ**
Specifications	:	**LAKE**

Test Substance

Description of the test substance : C-14 labelled ATMP

Test Method and Conditions

Test method description : Microcosm study

Test Results

Quantity	*Time*	*Comments on result*
5-12 %	**38 d**	Mineralisation to CO2

General Comments : A substantial proportion of this C-14 activity was removed from the water column due to absorption. Mass balance calculations showed that a significant amount (30-50%) was chemically bound in the test system, and this could be released upon acidification. A small amount of the C-14 activity was very tightly bound to the sediment and was released after ultrasonic homegenisation and the use of an extraction system.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **HYDROLYSIS**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Medium : **AQ**
Specifications : **SURF**

Test Method and Conditions

Test method description : Abiotic degradation under surface water condition.

Test Results

Quantity	*Time*
50 %	

References

Primary Reference : **TSDTAZ**
Schoberl, P. and Huber, L. Tenside Detergents, (1988)

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**SORPTION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Study type	:	**LAB**
Species/strain/system	:	10mg of National Bureau of Standards river sediment SRM 1645 in a synthetic hard water (CaCO3)

Test Substance

Description of the test substance	:	Radiolabelled compounds

Test Method and Conditions

Test method description	:	Partition coefficients were measured for all four phosphonic acids by equilibrating 1800ml aqueous solutions of given concentrations with the river sediments. Concentrations in the sediments were measured by scintillation counting.
Hardness of Water	:	**211 mg/l**

Exposure

Exposure Period	:	**8 d**
Dose / Concentration	:	**0.05-5.0 mg/l**
Dose / Concentration	:	Concentrations of 0.1 and 1.0mg/l (ppm) were also tested.

Test Results

Quantity	*Time*	*Comments on result*
	8 d	Sediment/water partition coefficients were found to be a function of the phosphonate concentration and water hardness, at the range of 300 to 2000, suggesting an effective adsorption to the sediment.

References

Primary Reference	:	**#MONSC*** Monsanto Company Unpublished Report
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**SORPTION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
Specifications	:	**SOIL**

Test Results

Quantity	*Time*	*Comments on result*
		Sorption coefficients: 1100-1300 at phosphonate concentration of 50-100mg/l. The Freundlich isoterm constant ranges from 32-237, depending on the soil type. (Steber & Wierich, 1987).

General Comments : According to the U.S. E.P.A. classification of substances, ATMP is regarded as being moderately to slightly mobile in soil. The sorption behaviour will probably depend on the nature of metals and charged species present in sediments.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **SORPTION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : In general, extremely water soluble chemicals do not readily absorb to sediment or soil, however, the chelating properties of ATMP cause it to have a high affinity for the mineral portion of sediment and soil.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **SORPTION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Test Results

General Comments : As a chelating agent, ATMP might be expected to affect distribution or availability of metals in the environment. In practice, a range of studies on phosphonates have demonstrated that this effect is minimal since ATMP adsorbs strongly to particulates. Only one of these studies was on ATMP.

References

Primary Reference : **45NZAP**
Gledhill, W. E. and Feijtel, T. Handbook of Environmental Chemistry, (1991)

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **BIOCONCENTRATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
FISH	**AQ**						

Test Substance

Description of the test substance : Radiolabelled 14-C ATMP

Test Method and Conditions

Test method description : OECD Guideline 305E. Bioaccumulation: flow through fish test followed by 2 weeks depuration.

Exposure

Dose / Concentration : **0.001 mg/l**

Test Results

Organ	*Bioconcent. Factor*	*Calc Basis*	*Time*	*State*	*Comments on result*
	24		**2-3 wk**		Mean bioconcentration factor. BCF increased slowly after 1 week exposure.
	9				BCF: following incubation in pure dilution water (1 day), a rapid decrease.
	4				BCF: further decrease observed after prolonged incubation in pure dilution water (10 days).
	17.7-5.2				Steady state BCF.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **BIOCONCENTRATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Zebra fish (Brachydanio rerio)

Test Substance

Description of the test substance : 50% aqueous solution ATMP diluted as appropriate

Test Method and Conditions

Test method description : Flow-through test. GLP: NO. Calculated data. Amount of radioactivity in fish versus that in water.

Exposure

Exposure Period : **4 wk**

Test Results

Organ	*Bioconcent. Factor*	*Calc Basis*	*Time*	*State*	*Comments on result*
	18-24		**4 wk**		Steady state BCF in the uptake phase.
					Radiolabel was rapidly reduced when fish was placed in clean water after 10-day period.
	0.016				Calculated BCF, based on a measured octanol/water partition coefficient.

General Comments : Since the OECD test flow scheme for accumulation considers a BCF of 100 to be the limit value for the boundary between compounds of negligible and significant bioaccumulation potential, ATMP has very little tendancy to bioaccumulate. These results were also published by Steber and Wierich, Chemosphere 16, pp. 1323-1337, 1987.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point : **MAMMALIAN ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Sprague-Dawley

Test Method and Conditions

Test method description : Briquest 301-32S (sodium aminotri(methylene phosphonate) 32%w/w expressed as acid) was administered orally. Limit test.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
RAT			**ORL**			**LD50**	Oral LD50 for rats greater than 10g/kg/body weight of the tested solution (equivalent to ca. 6.6g/kg of sodium salt, 4.4g/kg of the neutralised acid).

General Comments : Two mortalities occurred within 3-4 hours of dosing. All animals exhibited hunched posture, lethargy, piloerection and decreased respiratory rate. These effects disappeared within two days of dosing.

References

Primary Reference : **#AWLTD***
Albright and Wilson Ltd, Internal Report, 818/8208

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

[redacted]

End Point : **MAMMALIAN ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Sprague-Dawley rats
Dose / Concentration : **32 %**

Test Method and Conditions

Test method description : Briquest 301-32S, 32% w/w expressed as acid was administered orally. Limit test.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
RAT			**ORL**			**LD50**	Oral LD50 for rats was estimated at 15g/kg body weight (equivalent to approximately 9.9g/kg of sodium salt, 6.6g/kg of the acid).

General Comments : Six mortalities (3 males and 3 females) occurred within 4 hours of dosing. All animals exhibited hunched posture, lethargy, piloerection and decreased respiratory rate. These effects persisted in the surviving animals up to 7 days.

References

Primary Reference : **#AWLTD***
Albright and Wilson Ltd, Internal Report, 818/8208

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Sprague-Dawley
Dose / Concentration : **25 % Solution**

Test Method and Conditions

Test method description : ATMP (aminotri(methylene phosphonic acid)) as 25% aqueous solution of active acid was administered by gavage. Monsanto test protocol. GLP: NO

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
RAT			**ORL**			**LD50**	LD50 was estimated as 2910mg/kg in oral administration to rats.

General Comments : Toxic symptoms included diarrhea, salivation and tremors. At autopsy inflammation of the gastrointestinal mucosa plus liver and kidney hyperaemia were evident.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, Y-66-199

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Sprague-Dawley
Dose / Concentration : **32 % Solution**

Test Method and Conditions

Test method description : Briquest 301-32S as 32% w/w expressed as acid was administered percutaneously. Limit test. GLP: YES.

Test Results

Organism	Medium	Spec.	Route	Lifestage	Sex	Effect	Effect Comments
RAT			**SKN**	**ADULT**		**LD50**	Dermal LD50 of sodium aminotri(methylene phosphonate) in rats was calculated as >6.6g/kg - equivalent to 4.4g/kg of the neutralised acid.

References

Primary Reference : **#AWLTD***
Albright and Wilson Ltd, Internal Report, 57/8208

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : New Zealand white rabbits
Dose / Concentration : **25 % Solution**

Test Method and Conditions

Test method description : Aminotri(methylene phosphonic acid) 25% aqueous solution was administered by dermal application. H2O (Distilled water). Monsanto test protocol.

Test Results

Organism	Medium	Spec.	Route	Lifestage	Sex	Effect	Effect Comments
RBT			**SKN**	**ADULT**		**LD50**	Dermal LD50 for rabbits was calculated as >6310mg/kg of active acid.

General Comments : There were no death. Activity and food consumption were temporarily reduced in two animals receiving 3980 and 6310mg/kg respectively. Conclusion: this product is not harmful to rabbits by dermal application.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, Y66-199

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : SIDS initial assessment. This chemical is presently of low concern. There is need for further work. Short summary of the reasons which support the recommendation. The maximum tolerable concentration is three to four orders of magnitude higher than the predicted environmental concentrations of ATMP in water. ATMP is readily absorbed to sediment, however there is little evidence of repartitioning, therefore the bioavailability to sediment-dwelling organisms would appear to be low. In conclusion, ATMP represents little risk to the environment. The substance is not acutely toxic, nor, from the experimental evidence does it have mutagenic, teratogenic or carcinogenic properties. Under the predicted conditions of use the chemical is very unlikely to present a risk to health. If further work is recommended, summarise its nature. More information is needed on the use and the mode and frequency of use ot the substance and formulations containing it. In particular, the potential for aerosol formation should be addressed.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylphosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : At the manufacturing sites, containers are filled from bulk storage tanks with dedicated equipment. During the manufacturing, filling and loading operations, small samples are taken. Given the acidity of the product and its irritant properties, personal protective equipment is prescribed to eliminate direct contact.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylphosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : Human health. The substance is not acutely toxic, nor, from the experimental evidence does it have mutagenic, teratogenic(or other reproductive) or carcinogenic properties. The acid solution is irritant. There is no information on sensitizing potential. Under the predicted conditions of use the chemical is very unlikely to present a risk to health. However, the usefulness of the risk assessment is lessened by the lack of information on the mode and frequency of use of the substance and on the formulations in which it is used. No further toxicity test data are required. More information is needed on the uses and the mode and frequency of use of the substance and formaulations containing it. In particular, the potential for aerosol formation should be addressed.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylphosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : The health assessment. The assessment comprised a comparison of worst reasonable case exposure scenarios with calculated doses of concern for a range of toxic end points. While such comparisons will tend to lead to an over estimation of possible risk they can indicate areas of concern or interest for future work. The exposure scenarios presumed a high degree of dermal exposure but the only available toxicology data was via the oral route. The relationship between oral dosing in rat and dermal dosing in rat is unclear, since neither of the acute studies gave rise to a precise figure. Beyond the obvious finding that the substance is irritating but not acutely toxic and very unlikely to be of concern following repeated exposure, the precise effects on man cannot be predicted from those seen in the rat with a great deal of confidence. For this substance, the predicted doses of concern for each end point were well below the exposure levels, even assuming 100% absorption. Had the doses of concern been lower(and assuming that the exposure scenarios were reasonable) a better assessment of the real absorption would have been needed. The physical-chemical properties(high water solubility, negative log Pow) of the substance suggest that it is not absorbed. For example, if the absorption is 1%, the margin of safety including the Uncertainty Factor increases to 10000. The exposure scenarios shoudl be considered in greater detail. There was very little information on possible consumer use since only two companies supplied use information. Further, there was little information on mode of use - spray on liquid, giving rise to airborne droplets or aerosol, or dilutable liquid for example - or on concentrations in likely consumer formulations. Within the framework of the assumptions used, the skin contract areas may be much smaller and may be reduced further by the use of protective clothing, particularly in the workplace. Thus it is conceivable that the calculations greatly overestimate exposure from certain types of use but ignore others.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**
Geographic Area : **GBR**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**	**ADULT**	**M**	**5/GROUP**	**5/GROUP**
					F	**5/GROUP**	**5/GROUP**

Species/strain/system : Sprague-Dawley

Test Method and Conditions

Test method description : OECD Guideline 408.

Exposure

Exposure Type : **SHORT**
Dose / Concentration : **32 % w/w**
Exposure comments : Briquest 301-32S (32% w/w expressed) as acid. A number of different phosphonate compounds were administered via the diet in the 90-day repeated dose toxicity study. Dose equivalent 6000ppm.

Test Results

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

Oral rat NOAEL was estimated as >6000ppm sodium aminotri (methylene phosphonate) - the highest concentration tested.

General Comments : No mortalities and no treatment related effects in : food consumption, body weight gain, and clinical observations. No macroscopic abnormalities found on post mortem examination.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MAMMALIAN TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**
Geographic Area : **USA**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**	**ADULT**	**M**	**5/GROUP**	
					F	**5/GROUP**	

Species/strain/system : Long Evans rats

Test Substance

Purity Grade : **90%**

Test Method and Conditions

Test method description : GLP: NO. Observations and necropsies were carried out according to OECD Guidelines.

Exposure

Exposure Type : **SHORT**
Exposure Period : **34 d**
Dose / Concentration : **125-1000 mg/kg**
Exposure comments : ATMP - Dequest 2000 dried acid was given in the diet at dosage levels of 125, 240, 500, 750 and 1000mg/kg/day for 34 days. Controls received only food.

Test Results

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

No adverse treatment related effects were found.

NEF

No toxic effects were observed at 1000mg/kg/day (the highest dose tested).

General Comments : No treatment related effects were found on body weights, food consumption, survival or gross necropsy results. This study served as a range finder for carcinogenicity study and the top dose of 1000mg/kg/day was a realistic upper limit. No hematology or clinical chemistry data for this study. The effects considered were limited.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, BDN-75-117

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **CARCINOGENICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RAT			**ORL**	**ADULT**		**70/GROUP**	**70**

Species/strain/system : Long Evans rats

Test Method and Conditions

Test method description : OECD. GLP: NO

Exposure

Dose / Concentration : **50-500 mg/kg BW**
Exposure comments : 24-month dietary feeding at dosage levels of 0, 50, 150, and 500mg/kg/day.

Test Results

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

No effect level (NOEL) for rats was established at 500mg/kg/ day.

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

Reduced weights or weight ratios were observed in the high dose group.

BW	**DECR**

Reduced body weights were observed in the high dose group.

General Comments : A similar incidence of neoplastic and non-neoplastic lesions were observed in all groups at all sacrifices regardless of treatment. An unusual tumor type (osteosarcoma axilla) was observed in one high dose male animal. This was considered to have arisen by chance.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, BD-75-118

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
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, and TA1537

Test Substance

Vehicle - Solvent : Water

Test Method and Conditions

Test method description : OECD Guideline. GLP: YES

Exposure

Dose / Concentration : **50 % Solution**
Exposure comments : Spot test and plate incorporation assay were done with and without metabolic activation at the dose of 10ul/plate (from 50% solution).

Test Results

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

No mutagenic effect.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, DA-81-234

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **MUTAGENICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : L5178Y mouse lymphoma cells

Test Substance

Vehicle - Solvent : Water

Test Method and Conditions

Test method description : OECD Guideline. GLP: YES

Exposure

Dose / Concentration : **50 %**
Exposure comments : ATMP - dequest 2000 (neutralized) at approximately 50% aqueous solution was used as a stock solution to be added to culture plates with and without metabolic activation.

Test Results

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

No significant toxicity at levels up to 1200ul of 50% solution.

STRUC

Precipitation at dose of 100ul/l with metabolic activation and at > 1240ul/l of 50% solution without metabolic activation.

General Comments : Genotoxic effect was positive in cultures with metabolic activation and negative without activation. The results were consistent with the known finding that low pH yields a positive response in the presence of activation for the assay.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, SR-81-019

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**SENSITIZATION**
Chemical Name	:	**Aminotri(methylenephosphonic acid)**
CAS Number	:	**6419-19-8**
General Comments	:	No test carried out but no evidence of human sensitization during use over 20 years.

References

Primary Reference	:	**#MONSC*** Monsanto Company Unpublished Report
Secondary Reference	:	**!SIDSP*** OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **IRRITATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RBT			**SKN**	**ADULT**			

Species/strain/system : New Zealand white

Test Method and Conditions

Test method description : OECD Guideline 404: acute dermal irritation/corrosion. GLP:YES.

Exposure

Dose / Concentration : **50 %**
Exposure comments : Briquest 301-504 (ATMP) was applied as 50% solution.

Test Results

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

Mild irritation was observed.

SKN	**NEF**

No corrosive effects were observed.

General Comments : The compound was classified as a mild irritant (non-corrosive) with a primary irritation index of 0.1. Maximum score (erythema and eschar formation) - 1 after 1 hour. No oedema formation in any animal.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **IRRITATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RBT			**EYE**	**ADULT**			

Species/strain/system : New Zealand white rabbits

Test Method and Conditions

Test method description : Monsanto test protocol. GLP: NO.

Exposure

Exposure Type : **ACUTE**
Exposure comments : ATMP as dried dequest 2000 acid powder was applied.

Test Results

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

Oedema, copious discharge, moderate conjunctival redness and mild corneal cloudiness were recorded at one hour. Lids were nearly closed overnight.

General Comments : Improvement followed eye irrigation; within 5 days iris clarity was nearly normal in two instances. Conclusion: this product is irritating to eyes.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, Y-66-199

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **IRRITATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
RBT			**EYE**	**ADULT**			

Species/strain/system : New Zealand white rabbits

Test Method and Conditions

Test method description : OECD Guideline 405. GLP: YES.

Exposure

Exposure Type : **ACUTE**
Dose / Concentration : **32 % Solution**
Exposure comments : Briquest 301-32S sodium aminotri(methylene phosphonate) 32% w/w expressed as acid was applied in this acute eye irritation/corrosion test.

Test Results

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

No irritation effect was recorded maximum score cornea = 0, maximum score iris = 1 at one hour, maximum score conjunctivae = 1 at 48 hour (redness) and 1 at 1 hour (chemosis).

General Comments : Both Henkel and Monsanto (unpublished studies) have cited the parent acid ATMP as a moderate skin and eye irritant when studied in the rabbit.

References

Primary Reference : **#AWLTD***
Albright and Wilson Ltd, Internal Report, 678/8208

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **IRRITATION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	Medium	Specification	Route	Lifestage	Sex	Number exposed	Number controls
RBT			**SKN**	**ADULT**		**8/GROUP**	

Species/strain/system : New Zealand white rabbits

Test Substance

Vehicle - Solvent : water

Test Method and Conditions

Test method description : Monsanto test protocol.

Exposure

Dose / Concentration : **25 % Solution**
Exposure comments : ATMP was applied as dried acid and as 25% aqueous solution to the rabbits.

Test Results

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

As 25% solution ATMP was classified as a "moderately severe irritant".

SKIN **NEF**

As a powder ATMP was classified as non-irritating to skin.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, Y-66-199

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **REPRODUCTION**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Long Evans

Test Method and Conditions

Test method description : Modified OECD.

Exposure

Exposure Type : **LONG**
Dose / Concentration : **300-3000 ppm**
Exposure comments : Dietary administration of the solid active acid to male and female rats at 0, 300, 1000 or 3000ppm throughout premating, mating, gestation and lactation periods, for 3 generations.

Test Results

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

NOEL (No Observed Effect Level) for P generation F1 and F2 generations were established at 3000ppm (the highest dose tested).

REPRO	**NEF**

No reproductive toxicity was observed in parental animals nor in offsprings.

General Comments : No adverse treatment-related effects on reproductive parameters and no pathologic or histopathologic lesions were observed in either parental animals or pups.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, BO-76-119

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **TERATOGENICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Charles river CD rats

Test Method and Conditions

Test method description : FDA 1966: Guidelines. Teratological study.

Exposure

Exposure Type : **SHORT**
Dose / Concentration : **100-1000 mg/kg**
Exposure comments : ATMP neutral sodium salt of dequest 2000 at 22.4% aqueous solution expressed as active acid was administered by gavage on days 6 through 15 of gestation at 0, 100, 500, and 1000mg/kg/day of dose equivalent.

Test Results

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

NOAEL = 500mg/kg/day for maternal animals and NOAEL = 1000mg/kg/day (in utero exposure) for offspring.

General Comments : There was some evidence of maternal toxicity at 500 and 1000mg/kg/day - a slight decrease in weight gain in these animals was observed but not statistically significant in comparison with the controls. Pregnancy and litter data: mean number of corpora lutea, implantations and implantation efficiency comparable between treated and control animals. Increased resorptions at 100 and 1000mg/kg/day were observed, even though significantly greater than controls - there were within the historical range for this strain foetal data: one anomaly (shorter trunk) at 1000mg/kg/day (without skeletal abnormalities) and one case of anopthalmia also at 1000mg/kg/day.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, BD-78-54

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Rainbow trout (Oncorhynchus mykiss)
Exposure Period : **48 h**

Test Method and Conditions

Test method description : Sodium aminotri(methylene phosphonate) 32% w/w expressed as acid. Based on OECD 203, static test. GLP: YES - but not in line with those of today.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
FISH	**AQ**	**FRESH**				**LC50**	For 48 hours: 4344.5ppm + 1069.2ppm. Determined by use of probit analysis.

General Comments : No certificate of chemical analysis of dose formulations tested was supplied with the report. Fish were outside the upper length recommended in the OECD protocol. The test was conducted below the lower recommended temperature range. Photoperiod not given.

References

Primary Reference : **#AWLTD***
Albright and Wilson Ltd, Internal Report, 2474

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Carp
Exposure Period : **48 h**

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
FISH	**AQ**					**LC50**	For 48 hours: 260mg/l

References

Primary Reference : **TSDTAZ**
Huber, L. Tenside Detergents, 12, 316-322, (1975)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Rainbow trout (Oncorhynchus mykiss)
Exposure Period : **96 h**

Test Method and Conditions

Test method description : Dequest 2000 neutralized acid. US EPA 1975. Methods for acute toxicity test with fish, macroinvertebrates and amphibians EPA 660/3-75-00. Static test.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
FISH	**AQ**	**FRESH**				**LC50**	For 96 hours > 330mg/l of active acid.

General Comments : The product is practically not harmful to fish.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Sheepshead minnow (Cyprimedon variegatus)
Exposure Period : **96 h**

Test Method and Conditions

Test method description : Dequest 2000 neutralized acid. US EPA 1975. Methods for acute toxicity test with fish, macroinvertebrates and amphibians EPA 660/3-75-00. Static test.

Test Results

Organism	Medium	Spec.	Route	Lifestage	Sex	Effect	Effect Comments
FISH	**AQ**	**ESTUA**				**LC50**	For 96 hours = 8132mg/l of active acid. No effect level = 4381mg/l of active acid.

General Comments : The product is practically none-harmful to fish.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Rainbow trout (Oncorhynchus mykiss)

Test Results

Organism	Medium	Spec.	Route	Lifestage	Sex	Effect	Effect Comments
FISH	**AQ**	**FRESH**				**LC50**	For 14 days = 110mg/l (expressed as active acid).

General Comments : The product is practically non-harmful to Rainbow trout.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Species/strain/system : Rainbow trout (Oncorhynchus mykiss)
Exposure Period : **14 d**

Test Substance

Description of the test substance : Dequest 2000 neutralized acid.

Test Method and Conditions

Test method description : 14-day bioassay - U.S. E.P.A. 1975. Methods for acute toxicity tests with fish, macroinvertebrates and amphibians. Flow-through test. EPA 660/3-75-00. GLP:YES, ABC Laboratories.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
FISH	**AQ**	**FRESH**				**LC50**	For 14-day 150mg/l active acid Maximum no observed effect concentration for 14-day = 47mg/l Minimum observed effect concentration for 14-day = 94mg/l.

General Comments : "Product is practically non-harmful to rainbow trout."

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, 79-1384338-1

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Midge larvae
Exposure Period : **48 h**

Test Method and Conditions

Test method description : Dequest 2000 neutralized to pH 7. Acute toxicity US EPA 660/3-75-10.

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
INVER	**AQ**	**FRESH**				**LC50**	For 48h = 11400mg/l active acid. Maximum no observed effect concentration: 7040mg/l (prolonged test). Minimum observed effect concentration: 9240mg/l (prolonged test).

General Comments : "Dequest 2000 is practically non-toxic to invertebrates."

References

Primary Reference : **#BIOUR***
Reports to Monsanto. Bionomics, Unpublished Report, BN-76-90 A-C

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC ACUTE TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Grass shrimp (Palaemontes vulgaris)
Exposure Period : **96 h**

Test Method and Conditions

Test method description : Dequest 2000 neutralized to pH 7. Acute toxicity US EPA 660/3-75-10.
pH : **7**

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
CRUS	**AQ**	**MARIN**				**LC50**	For 96h = 4574mg/l.

General Comments : Dequest 2000 is practically non-harmful to invertebrates.

References

Primary Reference : **#BIOUR***
Reports to Monsanto. Bionomics, Unpublished Report, BN-76-90 A-C

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylphosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : The environment. The MTC is three to four orders of magnitude higher than the predicted environmental concentrations for ATMP in water. ATMP is readily adsorbed to sediment and could potentially pose a threat to sediment-dwelling organisms. However, phosponates are strongly adsorbed to sediments with little evidence of significant repartitioning. Therefore, the bioavailability of ATMP to sediment-dwelling organisms would appear to be low. The environmental safety assessment of this compound supports the conclusion that ATMP represents little risk to the environment.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylphosphonic acid)**
CAS Number : **6419-19-8**

Evaluations

Evaluation text : Assessment factors for application to aquatic toxicity data for estimating a maximum tolerable concentration(MTC). An assessment factor of 10 can be applied to the most sensitive species because there are data from algal, crustacean and fish chronic toxicity tests. The NOEC for a chronic test with algae is 7.4mg/l which gives an MTC of 0.74mg/l. However, there has been some concern about the validity of the algal test bearing in mind the problems caused by another chelating agent being added to the medium. If the algal test is disregarded then a factor of 100 has to be applied, using the OECD assessment factor system, to the most sensitive acute LC50 of 160mg/l giving a MTC of 1.6mg/l. Therefore, whether the algal test is included or not a very similar MTC value is obtained. There are no measured concentration values, therefore, modelled values have to be compared with the MTC. The values obtained from the DRANC model appear to be too high because it does not take into account the chelating properties of ATMP. However, if the MTC is compared with modelled values obtained by Procter and Gamble comparisons can be made. The MTC is twice as high as levels likely to be found in raw sewage. When compared with maximum likely levels in water the MTC is an order of magnitude higher than the highest level and three orders of magnitudes higher than kikely average levels. Another approach to assessment factors, developed in the U.K., focuses on the most sensitive species(Annex 4). If the algal data are included the U.K. method gives the same results. If the algal tests are not included then a factor of 100 has to be applied to the chronic test on rainbow trout giving a MTC of between 0.23 and 0.47mg/l. Again the result is similar whether the algal tests are included or not.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Algae: (Spirodela), (Selenastrum), (Anabaena), (Chlorella), (Nostoc)

Test Method and Conditions

Test method description : OECD Guideline 201. Algae, Growth Inhibition Test.

Test Results

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

Growth inhibition at >20mg/l for Spirodela.

POPUL **INHIB**
Growth inhibition at 100mg/l for Selenastrum.

POPUL **INHIB**
Growth inhibition at 10mg/l for Anabaena.

POPUL **INHIB**
Growth inhibition at 100mg/l for Chlorella, >30mg/l for Nostoc.

General Comments : The test results would imply that ATMP has only a limited effect on the growth of these algal species. The ability of ATMP to cause growth inhibition is thought to be related to its chelating ability; ATMP chelates metal ions which are essential to the growth of the algae.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme(5.3), (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Algae: (Selenastrum), (Chlorella)

Test Substance

Description of the test substance : Dequest 2000 neutralized to pH 7.

Test Method and Conditions

Test method description : Close to OECD Guideline.
pH : **7**

Exposure

Exposure Period : **4-14 d**

Test Results

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

For 96h = 20mg/l for Selenastrum.

EC50

For 96h = 100mg/l, for 14-day = 20mg/l for Chlorella

General Comments : Product is practically non-harmful to Selenastrum and Chlorella.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
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)

Exposure

Exposure Type : **ACUTE**
Exposure Period : **48 h**

Test Results

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

For 48h = 297mg/l (expressed as active acid)

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
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

Description of the test substance : Dequest 2000 neutralized to pH 7, 22% active acid

Test Method and Conditions

Test method description : 14-day bioassay. US EPA 1975. Methods for acute toxicity tests with fish, macroinvertebrates and amphibians. EPA 660/3-75-00.

Exposure

Exposure Type : **ACUTE**
Exposure Period : **48 h**

Test Results

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

For 48h. (Concentration not given)

NOEC

No effect concentration = 125mg/l

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
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

Description of the test substance : Dequest 2000 neutralized to pH 7.

Test Method and Conditions

Test method description : Monsanto procedure. GLP: YES. ABC Laboratories Q.A. procedures. Semi static.

Test Results

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

EC50>25mg/l and <50mg/l. Maximum no observed effect concentration = 25mg/l. Minimum observed effect concentration = 50mg/l.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report, (1976)

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

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

Species/strain/system : Goldfish (Golfenorfes)

Exposure

Exposure Period : **48 h**

Test Results

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

For 48 hours: 200mg/l (reported as ppm).

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **AQUATIC TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
MOLL	**AQ**	**ESTUA**					

Species/strain/system : Oysters

Test Substance

Description of the test substance : Dequest 2000 neutralized to pH 7.

Test Method and Conditions

Test method description : Acute toxicity US EPA 660/3-75-10.
pH : **7**

Exposure

Exposure Period : **96 h**

Test Results

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

For 96h = 201mg/l

General Comments : Dequest 2000 is practically non-harmful to invertebrates.

References

Primary Reference : **#BIOUR***
Reports to Monsanto. Bionomics, Unpublished Report, BN-76-90 A-C

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **TERRESTRIAL ACUTE TOXICITY**

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Oats (Avena lativa)
Exposure Period : **7-14 d**

Test Method and Conditions

Test method description : GLP: NO

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
PLANT	**TERR**					**LC50**	For 7 and 14 days > 1000mg/l.

General Comments : Other studies for the pre-emergent and post-emergent phytotoxicity showed ATMP as essentially non-phytotoxic. No reference given. Private communication to Monsanto.

References

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **TERRESTRIAL ACUTE TOXICITY**

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Species/strain/system : Bobwhite quail (Colinus virgianus)

Test Method and Conditions

Test method description : Dequest 2000, 50% solution. Dietary feeding. GLP: NO

Test Results

Organism	*Medium*	*Spec.*	*Route*	*Lifestage*	*Sex*	*Effect*	*Effect Comments*
BIRD	**TERR**					**LD50**	Higher than 2510mg/kg.

General Comments : Dequest 2000 is practically non-harmful to birds.

References

Primary Reference : **#MONSC***
Monsanto Company Unpublished Report

Secondary Reference : **!SIDSP***
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point	:	**TERRESTRIAL TOXICITY**
Chemical Name	:	**Aminotri(methylphosphonic acid)**
CAS Number	:	**6419-19-8**

Evaluations

Evaluation text	:	ATMP was found to be essentially non-phytotoxic in screening studies with a wide variety of weeds and crops.

References

Secondary Reference	:	**!SIDSP*** Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Study

End Point : **TERRESTRIAL TOXICITY**
Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**
Study type : **LAB**

Test Subject

Organism	*Medium*	*Specification*	*Route*	*Lifestage*	*Sex*	*Number exposed*	*Number controls*
PLANT	**TERR**						

Species/strain/system : Oats (Avena lativa)

Test Substance

Description of the test substance : ATMP at 1000mg/l of active acid.

Test Method and Conditions

Test method description : GLP: NO

Exposure

Exposure Period : **7-14 d**

Test Results

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

No observed effect concentration on growth = 1000mg/l. For 7-14 days, EC50 > 1000mg/l. No observed effect concentration (NOEC) at 1000mg/l in water used to water oat plants over 9 days.

General Comments : Other studies for the pre-emergent and post-emergent phytotoxicity showed ATMP as essential. No reference given. Private communication to Monsanto.

References

Secondary Reference : **!SIDSP***

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Substance

Chemical Name : **Aminotri(methylenephosphonic acid)**
CAS Number : **6419-19-8**

Description

Large spillages: neutralise with lime or soak up with earth/sand and bury/landfill sludge as permitted by Local Authorities. Small spillages: wash down to drain or sewer if acceptable to public authorities.

References

Secondary Reference : **!SIDSP***
Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)

Substance

Chemical Name :
Reported Name : **NITRICOTRIMETHYLPHOSPHONIC ACID**
CAS Number : **6419-19-8**

Area	*Type*	*Subject*	*Spec.*	*Description*	*Level / Summary Information :*
RUS	**REG**	**AQ**	**SURF**	**MAC CLASS**	1.0MG/L HAZARD CLASS: III

Title :

Reference : ***Effective Date :*** 1JAN1989

Last Amendment : **SPNPV*, 4630-88, 1988** ***Entry / Update :*** JUL1990

SANITARNYE PRAVILA I NORMY OKHRANY POVERKHNOSTNYKH VOD OT ZAGRIAZNENIA
(HEALTH REGULATION AND STANDARDS OF SURFACE WATER PROTECTION FROM CONTAMINATION)