The following acute toxicity test results have been determined for aquatic species:

2,3-dimethylaniline

Fish [*Oryzias latipes*]: 96 h LC_{50} > 94 mg/L (measured) [OECD TG 203, semi-static]
Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 8.9 mg/L (measured) [OECD TG 202, static]
Algae [*Pseudokirchneriella subcapitata*]: 72 h ErC_{50} = 41.4 mg/L (growth rate method) (measured) [OECD TG 201, static]

2,4-dimethylaniline

Fish: No reliable studies were identified. The predicted 96-hour LC_{50}, based on read across = 33.9 mg/L; The predicted 96-hour LC50, based on ECOSAR (v 1.00) = 14.28 mg/L

Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 9.9 mg/L [DIN38412, static]

Algae: No reliable studies were identified. The predicted 72-hour EC_{50}, based on read across = 8.59 mg/L; The predicted 96-hour EC50, based on ECOSAR (v 1.00) = 5.491 mg/L

2,5-dimethylaniline

Fish [*Oryzias latipes*]: 96 h LC_{50} > 110 mg/L (measured) [Other Guideline; Chemical Substances Control Law, Japan, semi-static]

Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 18 mg/L (measured) [Other Guideline; Chemical Substances Control Law, Japan, static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h ErC_{50} = 30 mg/L (growth rate method) (measured) [Other Guideline; Chemical Substances Control Law, static]

2,6-dimethylaniline

Fish [*Oryzias latipes*]: 96 h LC_{50} > 97.9 mg/L (measured) [OECD TG 203, semi-static, limit test]

Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 20 mg/L (measured) [OECD TG 202, static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h ErC_{50} > 100 mg/L (growth rate method) (nominal) [OECD TG 201, static]

3,4-dimethylaniline

Fish [*Oryzias latipes*]: 96 h LC_{50} > 97.9 mg/L (measured) [Other Guideline; Chemical Substances Control Law, Japan, semi-static]

Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 1.09 mg/L (measured) [Other Guideline; Chemical Substances Control Law, Japan, static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h ErC_{50} = 8.59 mg/L (growth rate method) (measured) [Other Guideline; Chemical Substances Control Law, static]

3,5-dimethylaniline

Fish [*Oryzias latipes*]: 96 h LC_{50} = 33.9 mg/L (measured) [OECD TG 203, semi-static]

Invertebrate [*Daphnia magna*]: 48 h EC_{50} = 2.2 mg/L (nominal) [OECD TG 202, static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h ErC_{50} = 29.1 mg/L (growth rate method) (nominal) [OECD TG 201, static]

The following chronic toxicity test results have been determined:

2,3-dimethylaniline

Invertebrate [*Daphnia magna*]: 21 d NOEC = 0.1 mg/L (measured) [Provisional procedure proposed by Federal Environmental Agency (Umweltbundesamt), semi-static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h NOEC = 4.32 mg/L (growth rate method) (measured) [OECD TG 201, static]

2,4-dimethylaniline

Invertebrate: No reliable studies were identified. The predicted 21-day NOEC, based on read across = 0.0095 mg/L

Algae: No reliable studies were identified. The predicted 72-hour NOEC, based on read across = 2.0 mg/L

2,5-dimethylaniline

Invertebrate [*Daphnia magna*]: 21 d NOEC = 0.096 mg/L (measured) [OECD TG 211, semi-static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h NOEC = 2.0 mg/L (growth rate method) (measured) [OECD TG 201, static]

2,6-dimethylaniline

Invertebrate [*Daphnia magna*]: 21 d NOEC = 2.23 mg/L (measured) [OECD TG 211, semi-static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h NOEC = 32 mg/L (growth rate method) (nominal) [OECD TG 201, static]

3,4-dimethylaniline

Invertebrate [*Daphnia magna*]: 21 d NOEC = 0.0095 mg/L (measured) [OECD TG 211, semi-static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h NOEC = 2.94 mg/L (growth rate method) (measured) [Other Guideline; Chemical Substances Control Law, Japan, static]

3,5-dimethylaniline

Invertebrate [*Daphnia magna*]: 21 d NOEC = 0.03 mg/L (nominal) [OECD TG 211, semi-static]

Algae [*Pseudokirchneriella subcapitata*]: 72 h NOEC = 5.8 mg/L (growth rate method) (nominal) [OECD TG 201, static]

Category dimethylaniline possesses properties indicating a hazard for the environment (acute aquatic toxicity values between 1 and 100 mg/L; chronic aquatic toxicity less than 1.0 mg/L). The chemical is not readily biodegradable and has a low bioaccumulation potential. Adequate screening-level data are available to characterize the hazard to the environment for the purposes of the OECD Cooperative Chemicals Assessment Programme.

Exposure

Use pattern

All category member substances are used mainly as intermediates for the production of dyes, pigments, pharmaceuticals and agrochemicals

According to the results of the environmental survey and wildlife monitoring and PRTR data in Japan, the release of dimethylanilines to the environment from its manufacturing and formulation plants is minimal.

Dimethylanilines, except 3,4-dimethylaniline (solid), are liquid at room temperature with low vapour pressure, occupational exposure through inhalation of vapour is not of concern. No OEL are established. The main uses of dimethylanilines are intermediates for the production of dyes, pigments, pharmaceuticals and agrochemicals. Because, there is no data available for contamination of dimethylanilines in the consumer products, consumer exposure potential are present.

COVER PAGE

SIDS Initial Assessment Report

For

SIAM XX

City name, Country name, Date Month, Year

1. Chemical Name:	Dimethylaniline Category
2. CAS Number:	87-59-2: 2,3- Dimethylaniline 95-68-1: 2,4-Dimethylaniline 95-78-3: 2,5-Dimethylaniline 87-62-7: 2,6-Dimethylaniline 95-64-7: 3,4-Dimethylaniline 108-69-0: 3,5-Dimethylaniline
3. Sponsor Country:	Japan Contact Point: Mr. Hiroshi Kamitsuji Deputy Director OECD Division Ministry of Foreign Affairs, Japan
4. Shared Partnership with:	
5. Roles/Responsibilities of the Partners: • Name of industry sponsor /consortium	
• Process used	
6. Sponsorship History • How was the chemical or category brought into the	Dimethylaniline Category is sponsored by Japan and is submitted for first discussion at SIAM XX.
7. Review Process Prior to the SIAM:	Japanese government peer-reviewed the documents and audited selected studies.
8. Quality check process:	Japanese government peer-review committee performed spot checks on randomly selected endpoints and compared original studies with data in the SIDS Dossier.
9. Date of Submission:	Date, Month, Year
10. Date of last Update:	Date, Month, Year
11. Comments:	

CONTENTS

Tables

1 IDENTITY

2 GENERAL INFORMATION ON EXPOSURE

2.1 Production Volumes and Use Pattern

Production methods

Dimethylanilines are generally produced in a closed system.

2,3-Dimethylaniline is produced from nitration and reduction of commercial xylene, followed by removal of the 2,4-, 2,5- and 2-6- isomers. Residue is made alkaline after which 2,3-isomer is precipitated as formyl derivative (HSDB, 2012).

2,4-Dimethylaniline is produced from nitration and reduction of commercial xylene (HSDB, 2012).

2,5-Dimethylaniline is commercially by the following method: 1) nitrating and reducing commercial xylene to an isomeric mixture of xylidines, 2) after 2,4-xylidine is removed by formation of the acetate salt, 2,5-xylidine hydrochloride is precipitated by the addition of hydrochloric acid and this can be converted to 2,5-xylidine by the addition of base (HSDB, 2012).

2,6-Dimethylaniline is produced from nitration and reduction of commercial xylene, followed by the removal of the 2,4-isomer by formation of the acetate salt, removal of the 2,5-isomer by formation of the hydrochloride (HSDB, 2012).

3,4-Dimethylaniline is produced from nitration of o-xylene, followed by reduction, bromination of o-xylene, followed by reaction with ammonia (HSDB, 2012).

3,5-Dimethylaniline is produced from nitration and reduction of xylene, followed by the separation of the 3,5-isomer by conversion to the formyl derivative which is then hydrolyzed to the free base (HSDB, 2012).

Use Pattern

Dimethylanilines are used mainly as intermediates for the production of dyes, pigments, pharmaceuticals and agrochemicals (NITE, 2012).

2,3-Dimethylaniline is used as a chemical intermediate for dyes and the synthesis of mefenamic acid (HSDB, 2012).

2,4-Dimethylaniline is used as a chemical intermediate for the synthesis of acetoacet-2,4-xylidide; Acid Orange 24; Acid Red 26; amitraz; 3-hydroxy-2-naphth-2'l,4'-xylidide; mefluidide; Solvent Orange 7 (HSDB, 2012).

2,4-Dimethylaniline is used as intermediate for Direct Violet 14, photographic chemicals, pesticides, pharmaceuticals and dyes (HSDB, 2012).

2,5-Dimethylaniline is used as a chemical intermediate for the synthesis of Direct Yellow 51, Solvent Red 22, Solvent Red 26 and used in the manufacture of p-xyloquinone; Direct Violet 7 (HSDB, 2012).

2,6-Dimethylaniline is used as a chemical intermediate for the manufacture of pesticides, dyestuffs, antioxidants, pharmaceuticals, synthetic resins, fragrances, and other products and as a starting material in the production of agrochemicals (HSDB, 2012).

2,6-Dimethylaniline is used as a chemical intermediate in the synthesis of: benalaxyl; bupivacaine; denatonium benzoate; dimethaclor; furalaxyl; lidocaine; lidoflazine; mepivacaine; metalaxyl; metazachlor; ofurace; oxadixyl; xipamide (HSDB, 2012).

3,4-Dimethylaniline is used as a chemical intermediate for the synthesis of riboflavin (HSDB, 2012).

3,5-Dimethylaniline is used as a chemical intermediate for the synthesis of Pigment Red 149 (HSDB, 2012).

2.2 Environmental Exposure and Fate

2.2.1 Sources of Environmental Exposure

The results from the Report on Environmental Survey and Wildlife Monitoring of Chemicals compiled by the Ministry of the Environment are summarized in from Table 2- 1 to Table 2- 6. This survey is carried out for water, bottom sediments, fishes, air, etc., at the sampling points set up around the country (MOE, 2012).

Table 2- 1 Results of the environmental survey and wildlife monitoring for 2,3-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	1990	0/54	0/18	-	0.02 μg/L
Surface water	1976	0/68	0/20	-	0.1-1 μg/L
Sediment	1990	0/54	0/18	-	0.011 μg/g dry
Sediment	1976	6/68	2/20	0.006-0.090 μg/g dry	0.001-00.006 μg/g dry
Wildlife (Fish)	1990	0/27	0/9	-	0.005μg/g wet
Air	1990	0/51	0/17	-	500 ng/m^3

Table 2- 2 Results of the environmental survey and wildlife monitoring for 2,4-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	1977	0/6	0/2	-	1-5 μg/L
Sediment	1977	0/6	0/2	-	0.25-1 μg/g dry

Table 2- 3 Results of the environmental survey and wildlife monitoring for 2,5-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	1976	0/68	0/20	-	0.2-0.5 μg/L

Sediment	1976	2/68	1/20	0.006-0.027μg/g dry	0.001-0.004 μg/g dry

Table 2- 4 Results of the environmental survey and wildlife monitoring for 2,6-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	2005	0/12	0/4	-	0.021 μg/L

Table 2- 5 Results of the environmental survey and wildlife monitoring for 3,4-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	2005	0/12	0/4	-	0.0072 μg/L
Surface water	1977	0/6	0/2	-	1-20 μg/L
Surface water	1976	0/68	0/20	-	0.06-0.7μg/L
Sediment	2005	0/9	0/3	-	0.0007 μg/g dry
Sediment	1977	0/6	0/2	-	0.25-4 μg/g dry
Sediment	1976	8/68	4/20	0.001-0.043 μg/g dry	0.001-0.004μg/g dry

Table 2- 6 Results of the environmental survey and wildlife monitoring for 3,5-dimethylaniline

Media	Fiscal Year	Number of detections/Number of samples	Number of detection stations/Number of sampling stations	Range of detection	Limit of detection
Surface water	1976	1/68	1/20	0.04μg/L	0.02-0.2 μg/L
Sediment	1976	5/68	3/20	0.002-0.01 μg/g dry	0.0005-0.0016 μg/g dry

In the Japanese PRTR (Pollution Release and Transfer Register) system, which is similar to Toxic Release Inventory system (TRI), release and transferred amounts of 2,6-dimethylaniline is reported annually (Table 2- 7).

Release and transferred amounts of 2,4-dimethylaniline and 3,4-dimethylaniline are not notified in fiscal year 2009.

Table 2- 7 PRTR data of 2,6-dimethylaniline in Japan

Amounts of release & transfers	Releases (kg/year)			Transfers (kg/year)
	Reported	Estimated	Total	
Fiscal Year 2009	2	-	2	558
Fiscal Year 2008	3	-	3	25
Fiscal Year 2007	3	-	3	27

Concerning the production and processing sites in the sponsor country, no detailed information is obtained. According to the results of the environmental survey and wildlife monitoring and PRTR data in Japan as mentioned above, the release of dimethylanilines to the environment from its manufacturing and formulation plants is minimal.

2.2.2 Photo-degradation

All category member substances entering in the atmosphere are expected to be degraded by hydroxyl radicals. Calculated half-life times and a rate constants using AOPWIN (version 1.92a), which are obtained for the indirect photo-oxidation of category member substances by reaction with hydroxyl radicals in air, are shown in Table 2- 8 (USEPA, 2008a). Concentration of hydroxyl radicals was assumed to be 1.5×10^{6} OH/cm^3 and time flame of hydroxyl radicals is 12 hours/day for all category member substances.

Table 2- 8 Half-life times and rate constants in the atmosphere of dimethylanilines

Substance	Half-life time (day)	Rate constant (cm^3/molecule-sec)
2,3-dimethylaniline	0.053	200.3×10^{-12}
2,4-dimethylaniline	0.066	162.0×10^{-12}
2,5-dimethylaniline	0.053	200.3×10^{-12}
2,6-dimethylaniline	0.066	162.0×10^{-12}
3,4-dimethylaniline	0.053	200.3×10^{-12}
3,5-dimethylaniline	0.053	200.3×10^{-12}

2.2.3 Stability in Water

All category member substances are not expected to undergo hydrolysis in the environment due to the lack of hydrolysable functional groups. Stability of 2,6-dimethylaniline in water was examined according to OECD TG 111. 2,6-Dimethylaniline was not hydrolyzed at 50°C with residual amount of 100, 97.9 and 102 % at pH 4.0, 7.0 and 9.0, respectively. Therefore, a half-life time of 2,6-dimethylaniline is considered to be more than 1 year at 25°C (CERI, 2003).

2.2.4 Transport between Environmental Compartments

Fugacity modellings (level III) for dimethylanilines were conducted using EPISUITE, version 4.0 (USEPA, 2008b). Input parameters and results are shown in Table 2- 9 and Table 2- 10, respectively. When equal and continuous release to air, water and soil is assumed, dimethylanilines are mainly distributed in water and soil compartments. If released to the water compartment only, dimethylanilines stay in the water compartment. These results have to be treated with caution because partial dissociation of the substance is possible under particular environmental conditions.

Table 2- 9 Input parameters of dimethylanilines

Substance	Water solubility (mg/L)	Boiling point (°C)	Melting point (°C)	log K_{ow}	Vapour pressure (mmHg)	Henry's lawconstant (atm-m^3/mole)
2,3-dimethylaniline	6600	221.5	<-15	1.84	0.075	2.32×10^{-6}
2,4-dimethylaniline	6100	214	-14.3	1.68	0.098	3.45×10^{-6}
2,5-dimethylaniline	5600	214	15.5	1.91	0.15	2.32×10^{-6}
2,6-dimethylaniline	6980	217.8	7.5	1.78	0.474	2.32×10^{-6}
3,4-dimethylaniline	2500	228	51	1.84	0.028	2.32×10^{-6}
3,5-dimethylaniline	4600	220.5	9.8	1.83	0.128	2.32×10^{-6}

Table 2- 10 **Environmental distribution of** dimethylanilines **with Fugacity Level III model**

2,3-dimethylaniline	Release to air, water and soil	Release to air	Release to water	Release to soil
Air compartment	0.07 %	26.6 %	0.004 %	0.002 %
Water compartment	21.7 %	10.7 %	98.9 %	2.82 %
Soil compartment	77.9 %	62.6 %	0.01 %	97.2 %
Sediment compartment	0.24 %	0.12 %	1.1 %	0.03 %
2,4-dimethylaniline	Release to air, water and soil	Release to air	Release to water	Release to soil
Air compartment	0.08 %	33.9 %	0.008 %	0.003 %
Water compartment	21.8 %	12.2 %	98.9 %	2.85 %
Soil compartment	77.9 %	53.9 %	0.01 %	97.1 %
Sediment compartment	0.24 %	0.13 %	1.1 %	0.03 %
2,5-dimethylaniline	Release to air, water and soil	Release to air	Release to water	Release to soil
Air compartment	0.07 %	26.6 %	0.004 %	0.002 %
Water compartment	21.8 %	10.8 %	98.9 %	2.87 %
Soil compartment	77.9 %	62.5 %	0.01 %	97.1 %
Sediment compartment	0.24 %	0.12 %	1.1 %	0.03 %
2,6-dimethylaniline	Release to air, water and soil	Release to air	Release to water	Release to soil
Air compartment	0.08 %	26.6 %	0.005 %	0.003 %
Water compartment	21.7 %	10.7 %	98.9 %	2.82 %
Soil compartment	77.9 %	62.6 %	0.01 %	97.2 %
Sediment compartment	0.24 %	0.12 %	1.1 %	0.03 %
3,4-dimethylaniline	Release to air, water and soil	Release to air	Release to water	Release to soil
Air compartment	0.07 %	26.6 %	0.004 %	0.002 %
Water compartment	21.8 %	10.8 %	98.9 %	2.87 %
Soil compartment	77.9 %	62.5 %	0.01 %	97.1 %
Sediment compartment	0.24 %	0.12 %	1.1 %	0.03 %
3,5-dimethylaniline	Release to air,	Release to	Release to	Release to

	water and soil	air	water	soil
Air compartment	0.07 %	26.6 %	0.004 %	0.002 %
Water compartment	21.9 %	10.8 %	98.9 %	2.92 %
Soil compartment	77.8 %	62.4 %	0.01 %	97 %
Sediment compartment	0.24 %	0.12 %	1.1 %	0.03 %

Henry's law constant of 0.18-1.1 Pa.m3/mole at 20-25°C suggests that volatilization of category member substances from water is slow (Lyman W.J. et al., 1990).

2.2.5 Biodegradation

A ready biodegradation study was conducted with 2,3-dimethylaniline according to an equivalent protocol with OECD test-guideline 301C with activated sludge for four weeks in compliance with GLP (CERI, 1989a). The concentration of the test substance was 100 mg/L and the concentration of the activated sludge was 30 mg/L as suspended solid matters. The test result showed 2-3 % degradation by BOD.

A ready biodegradation study was conducted with 2,4-dimethylaniline according to an equivalent protocol with OECD test-guideline 302C with activated sludge for two weeks (CERI, 1981). The concentration of the test substance was 30 mg/L and the concentration of the activated sludge was 100 mg/L as suspended solid matters. The test result showed 0 % degradation by BOD.

A ready biodegradation study was conducted with 2,5-dimethylaniline according to an equivalent protocol with OECD test-guideline 301C with activated sludge for four weeks in compliance with GLP (CERI, 1989b). The concentration of the test substance was 100 mg/L and the concentration of the activated sludge was 30 mg/L as suspended solid matters. The test result showed 1 % degradation by BOD.

An OECD test guideline 301C test was conducted with 2,6-dimethylaniline with activated sludge for four weeks in compliance with GLP (CERI, 2001). The concentration of the test substance was 100 mg/L and the concentration of the activated sludge was 30 mg/L as suspended solid matters. The test result showed 0 % degradation by BOD.

A ready biodegradation study was conducted with 3,4-dimethylaniline according to an equivalent protocol with OECD test-guideline 302C with activated sludge for two weeks (CERI, 1977a). The concentration of the test substance was 30 mg/L and the concentration of the activated sludge was 100 mg/L as suspended solid matters. The test result showed 7.1 % degradation by BOD.

A ready biodegradation study was conducted with 3,5-dimethylaniline according to an equivalent protocol with OECD test-guideline 301C with activated sludge for four weeks in compliance with GLP (CERI, 1989c). The concentration of the test substance was 100 mg/L and the concentration of the activated sludge was 30 mg/L as suspended solid matters. The test result showed 3 % degradation by BOD.

Biodegradation of 0-7.1 % by BOD suggests that category member substances are not readily biodegradable. Additionally, BIOWIN estimation (version 4.10) predicts that dimethylanilines are classified as not ready biodegradable (USEPA, 2009).

Table 2- 11 Results of biodegradation test for dimethylanilines

Substance	Method	GLP	Degradation by BOD	Reference
2,3-dimethylaniline	OECD TG 301C	Yes	2-3 %	CERI, 1989a
2,4-dimethylaniline	OECD TG 302C	No	0 %	CERI, 1981
2,5-dimethylaniline	OECD TG 301C	Yes	1 %	CERI, 1989b
2,6-dimethylaniline	OECD TG 301C	Yes	0 %	CERI, 2001
3,4-dimethylaniline	OECD TG 302C	No	7.1 %	CERI, 1977a
3,5-dimethylaniline	OECD TG 301C	Yes	3 %	CERI, 1989c

2.2.6 Bioaccumulation

Although bioaccumulation studies for 2,4-dimethylaniline, 2,5-dimethylaniline and 3,4-dimethylaniline were conducted according to an equivalent protocol with OECD test-guideline 305C, no information on the studies of bio-concentration on 2,3-dimethylaniline, 2,6-dimethylaniline and 3,5-dimethylaniline. Using an octanol-water partition coefficient (log K_{ow}) of 1.84, 1.78 and 1.83, a bio-concentration factor of 7.6, 6.9 and 7.5 are calculated with BCFBAF, version 3.00, respectively (USEPA, 2008c).

In a study performed according to an equivalent protocol with OECD test-guideline 305C with carp exposed to 2,4-dimethylaniline at concentrations of 1.0 mg/L and 0.1 mg/L, bio-concentration factors of 4.1 – < 10 were obtained over six weeks exposure period (CERI, 1977b).

In a study performed according to an equivalent protocol with OECD test-guideline 305C in compliance with GLP with carp exposed to 2,5-dimethylaniline at concentrations of 1 mg/L and 0.1 mg/L, bio-concentration factors of 1.5 – < 3.8 were obtained over six weeks exposure period (CERI, 1990).

In a study performed according to an equivalent protocol with OECD test-guideline 305C with carp exposed to 3,4-dimethylaniline at concentrations of 1.0 mg/L and 0.1 mg/L, bio-concentration factors of 1.9 – < 10 were obtained over six weeks exposure period (CERI, 1977c).

These results show a low potential for bioaccumulation of dimethylanilines for aquatic organisms.

Table 2- 12 Summary of bioaccumulation for dimethylanilines

Substance	Method	GLP	BCF	Reference
2,3-dimethylaniline	Calculation with BCFBAF using log Kow of 1.84	-	7.6	USEPA, 2008c
2,4-dimethylaniline	OECD TG 305C	No	4.1 - <10	CERI, 1977b
2,5-dimethylaniline	OECD TG 305C	Yes	1.5 - <3.8	CERI, 1990
2,6-dimethylaniline	Calculation with BCFBAF using log Kow of 1.78	-	6.9	USEPA, 2008c

3,4-dimethylaniline	OECD TG 305C	No	1.9 - <10	CERI, 1977c
3,5-dimethylaniline	Calculation with BCFBAF using log Kow of 1.83	-	7.5	USEPA, 2008c

2.3 Human Exposure

2.3.1 Occupational Exposure

There is no Occupational Exposure Limit (OEL) for dimethylanilines in Japan.

Dimethylanilines, except 3,4-dimethylaniline (solid), are liquid at room temperature with low vapour pressure, occupational exposure through inhalation of vapour is not of concern.

2.3.2 Consumer Exposure

The main uses of dimethylanilines are intermediates for the production of dyes, pigments, pharmaceuticals and agrochemicals. Because, there is no data available for contamination of dimethylanilines in the consumer products, consumer exposure potential are present.

3 HUMAN HEALTH HAZARDS

4 HAZARDS TO THE ENVIRONMENT

The dimethylaniline category member substances contain the similar molecular structures, which are direct connection of two methyl functional groups (-CH_3) and one amino functional group (-NH_3) to a benzene-ring. Ecotoxicity is similar for the dimethylaniline with data for fish, invertebrate and algal toxicity indicating similar order toxicity across the chemicals tested. Read across has been applied to support and address data gaps for category member substances. Reliable data have been summarized below.

4.1 Aquatic Effects

Acute and chronic toxicity studies of dimethylaniline to aquatic species from three trophic levels are available.

Acute Toxicity Test Results

Fish

Data on the acute toxicity to fish are available for category member substances except 2,4-dimethylaniline. Reliable studies are summarized in Table 4- 1.

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **2,3-dimethylaniline** of 0, 10, 13, 18, 24, 32, 42, 56, 75 and 100 mg/L for 96 hours in an acute study performed according to OECD TG 203 under semi-static conditions in compliance with GLP. Mean analytical values were 0, 9.4, 12.6, 17.5, 23.0, 30.6, 39.9, 53.0, 71.4 and 94.4 mg/L, and mortality was 0, 0, 0, 0, 0, 0, 0, 0 and 20 % after 96 hours, respectively. The lowest concentration at which 100% mortality occurred was > 94 mg/L at 96 hours. The 96-hour LC_{50}, based on the arithmetic mean of measured concentrations, was > 94 mg/L (MOE, Japan, 2004a).

No reliable studies were identified for **2,4-dimethylaniline**. The 96-hour LC_{50} values for other category member substances are between 33.9 and > 110 mg/L. The predicted 96-hour LC_{50}, based on read across from the lowest 96-hour LC_{50} (3,5-dimethylaniline), for 2,4-dimethylaniline is 33.9 mg/L. The predicted 96-hour LC_{50}, based on ECOSAR (v 1.00) for 2,4-dimethylaniline and other category members are 14.28 mg/L.

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **2,5-dimethylaniline** of 0, 28, 44, 69 and 110 mg/L for 96 hours in an acute study performed according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 203 under semi-static conditions in compliance with GLP. Mean analytical values were 0, 27.7, 44.3, 68.6 and 110 mg/L, and mortality was 0, 0, 0, 0 and 0 % after 96 hours, respectively. The lowest concentration at which 100% mortality occurred was > 110 mg/L at 96 hours. The 96-hour LC_{50}, based on the arithmetic mean of measured concentrations, was > 110 mg/L (MOE, Japan, 2009a).

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **2,6-dimethylaniline** of 0 and 100 mg/L for 96 hours in an acute study performed according to OECD TG 203 under semi-static conditions in compliance with GLP (Limit test). Mean analytical values were 0 and 97.9 mg/L, and mortality was 0 and 0 % after 96 hours, respectively. The lowest concentration at which 100% mortality occurred was > 97.9 mg/L at 96 hours. The 96-hour LC_{50}, based on the geometric mean of measured concentrations, was > 97.9 mg/L (MOE, Japan, 2003a).

Three studies of **2,6-dimethylaniline** were conducted with *Cyprinus carpio*, Japanese Medaka, *Oryzias latipes* and *Carassius auratus* in a flow-through system and showed that the 96-hour LC_{50} were 112, 125 and 130 mg/L (Tonogai et al., 1983). A study with *Oryzias latipes* was performed in a static system and showed that the 96-hour LC_{50} was 130.4 mg/L (Tonogai et al., 1983).

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **3,4-dimethylaniline** of 0, 10, 18, 32, 56 and 100 mg/L for 96 hours in an acute study performed according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 203 under semi-static conditions in compliance with GLP. Mean analytical values were 0, 9.64, 16.6, 30.4, 55.5 and 97.9 mg/L, and mortality was 0, 0, 0, 0, 0 and 40 % after 96 hours, respectively. The lowest concentration at which 100% mortality occurred was > 97.9 mg/L at 96 hours. The 96-hour LC_{50}, based on the arithmetic mean of measured concentrations, was > 97.9 mg/L (MOE, Japan, 2005a).

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **3,5-dimethylaniline** of 0, 6, 12, 24, 48 and 96 mg/L for 96 hours in an acute study performed according to OECD TG 203 under semi-static conditions in compliance with GLP. Mean analytical values were 0, 5.69, 11.7, 23.9, 45.2 and 91.6 mg/L, and mortality was 0, 0, 0, 20, 80 and 100 % after 96 hours, respectively. The lowest concentration at which 100% mortality occurred was 96 mg/L at 96 hours. The 96-hour LC_{50}, based on the nominal concentrations, was 33.9 mg/L (EA, Japan, 1998a).

Freshwater fish, Japanese Medaka, *Oryzias latipes,* were exposed to nominal concentrations of **3,5-dimethylaniline** of 0, 1.00, 3.04, 9.57 and 30.0 mg/L for 14 days in a prolonged study performed according to OECD TG 204 under flow through conditions in compliance with GLP. Mean analytical values were 0, 0.81, 2.86, 9.04 and 28.5 mg/L, and mortality was 0, 0, 0, 10 and 50 % after 14 days, respectively. The 14-day LC_{50} and NOEC, based on the arithmetic mean of measured concentrations, were 28.5 and 0.81 mg/L (EA, Japan, 1998b).

A study of **3,5-dimethylaniline** with Japanese Medaka, *Oryzias latipes* was performed in a static system according to JIS K0102 and showed that the 48-hour TLm was 17 mg/L (Tonogai et al., 1982).

Table 4- 1 Summary of Acute Toxicity to Fish

Test substance (CAS No.)	Species	Method	Result (mg/L)	Reliability	Reference
2,3-Dimethylaniline (87-59-2)	*Oryzias latipes*	OECD TG 203 Semi-static	96h LC_{50} >94	1	MOE, Japan, 2004a
2,4-Dimethylaniline (95-68-1)			96h LC_{50} = 33.9		RA
2,5-Dimethylaniline (95-78-3)	*Oryzias latipes*	Other Guideline; Chemical Substances Control Law, Japan (equivalent to OECD Guideline 203) Semi-static	96h LC_{50} >110	1	MOE, Japan, 2009a
2,6-Dimethylaniline (87-62-7)	*Oryzias latipes*	OECD TG 203 Semi-static, limit test	96h LC_{50} >97.9	1	MOE, Japan, 2003a
	Cyprinus carpio	Flow-through	48h LC_{50} = 112	2	Tonogai et al., 1983
	Oryzias latipes	Flow-through	48h LC_{50} = 125	2	
	Carassius auratus	Flow-through	48h LC_{50} = 130	2	
	Oryzias latipes	Static	48h LC_{50} = 130.4	2	
3,4-Dimethylaniline (95-64-7)	*Oryzias latipes*	Other Guideline; Chemical Substances Control Law, Japan (equivalent to OECD Guideline 203) Semi-static	96h LC_{50} >97.9	1	MOE, Japan, 2005a
3,5-Dimethylaniline (108-69-0)	*Oryzias latipes*	OECD TG 203 Semi-static	96h LC_{50} = 33.9	1	EA, Japan, 1998a
	Oryzias latipes	OECD TG 204 Flow through	14d LC_{50} = 28.5 14d NOEC = 0.81	1	EA, Japan, 1998b
	Oryzias latipes	JIS K0102 Static	48h TLm = 17	2	Tonogai et al., 1982

TLm: Median Tolerance Limit, RA: Read Across

Invertebrate

Data on the acute toxicity to aquatic invertebrates are available for all category member substances. Reliable studies are summarized in Table 4- 2.

Daphnia magna were exposed to **2,3-dimethylaniline** at nominal concentrations of 0, 1.0, 1.8, 3.2, 5.6, 10, 18 and 32 mg/L for 48 hours in a static system according to OECD TG 202. The mean measured concentrations were 0, 0.91, 1.73, 3.14, 5.65, 9.53, 17.8 and 31.2 mg/L, respectively. Immobility was 0, 0, 0, 10, 25, 50, 85 and 100 % after 48 hours. The 48-hour EC_{50} was 8.9 mg/L based on the arithmetic mean of measured concentrations (MOE, Japan, 2004b).

An acute toxicity study of **2,4-dimethylaniline** with *Daphnia magna* has been reported (Kühn et al., 1989a). This study was conducted in a static system according to DIN38412. The 48-hour EC_{50} based on immobilization was 9.9 mg/L.

The other study of **2,4-dimethylaniline** was conducted with *Daphnia magna* in a static system and showed that the 24-hour LC_{50} was 25 mg/L (Bringmann, and Kühn, 1977).

Daphnia magna were exposed to **2,5-dimethylaniline** at nominal concentrations of 0, 6.0, 7.7, 10, 13, 17, 22, 28 and 36 mg/L for 48 hours in a static system according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 202. The mean measured concentrations were 0, 5.84, 7.48, 9.72, 11.3, 16.7, 21.7, 27.3 and 35.2 mg/L, respectively. Immobility was 0, 0, 0, 0, 0, 25, 85, 100 and 100 % after 48 hours. The 48-hour EC_{50} was 18 mg/L based on the arithmetic mean of measured concentrations (MOE, Japan, 2009b).

Daphnia magna were exposed to **2,6-dimethylaniline** at nominal concentrations of 0, 10, 18, 32, 56 and 100 mg/L for 48 hours in a static system according to OECD TG 202. The mean measured concentrations were 0, 9.68, 17.2, 30.7, 53.5 and 96.3 mg/L, respectively. Immobility was 0, 0, 20, 100, 100 and 100 % after 48 hours. The 48-hour EC_{50} was 20 mg/L based on the geometric mean of measured concentrations (MOE, Japan, 2003b).

Daphnia magna were exposed to **3,4-dimethylaniline** at nominal concentrations of 0, 0.56, 1.0, 1.3, 1.8 and 3.2 mg/L for 48 hours in a static system according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 202. The mean measured concentrations were 0, 0.542, 0.960, 1.24, 1.73 and 3.10 mg/L, respectively. Immobility was 0, 0, 35, 65, 95 and 100 % after 48 hours. The 48-hour EC_{50} was 1.09 mg/L based on the arithmetic mean of measured concentrations (MOE, Japan, 2005b).

Daphnia magna were exposed to **3,5-dimethylaniline** at nominal concentrations of 0, 1.00, 1.30, 1.70, 2.30, 3.00, 5.50, 13.0 and 30 mg/L for 48 hours in a static system according to OECD TG 202. The mean measured concentrations were 0, 0.970, 1.24, 1.67, 2.20, 2.88, 5.25, 12.6 and 29.0 mg/L, respectively. Immobility was 0, 0, 0, 10, 65, 90, 100, 100 and 100 % after 48 hours. The 48-hour EC_{50} was 2.2 mg/L based on the nominal concentrations (EA, Japan, 1998c).

Table 4- 2 Summary of Acute Toxicity to Aquatic Invertebrates

Test substance (CAS No.)	Species	Method	Result (mg/L)	Reliability	Reference
2,3-Dimethylaniline (87-59-2)	*Daphnia magna*	OECD TG 202 Static	48h EC_{50} = 8.9 immobilization	1	MOE, Japan, 2004b
2,4-Dimethylaniline (95-68-1)	*Daphnia magna*	DIN38412 Static	48h EC_{50} = 9.9 immobilization	2	Kühn et al., 1989a
	Daphnia magna	Static	24h LC_{50} = 25	2	Bringmann, and Kühn, 1977
2,5-Dimethylaniline (95-78-3)	*Daphnia magna*	Other Guideline; Chemical Substances Control Law, Japan (equivalent to OECD Guideline 202) Static	48h EC_{50} = 18 immobilization	1	MOE, Japan, 2009b
2,6-Dimethylaniline (87-62-7)	*Daphnia magna*	OECD TG 202 Static	48h EC_{50} = 20 immobilization	1	MOE, Japan, 2003b
3,4-Dimethylaniline (95-64-7)	*Daphnia magna*	Other Guideline; Chemical Substances	48h EC_{50} = 1.09 immobilization	1	MOE, Japan, 2005b

		Control Law, Japan (equivalent to OECD Guideline 202) Static			
3,5-Dimethylaniline (108-69-0)	*Daphnia magna*	OECD TG 202 Static	48h EC_{50} = 2.2 immobilization	1	EA, Japan, 1998c

Aquatic plant, e.g. Algae

Data on the acute toxicity to aquatic plants are available for category member substances except 2,4-dimethylaniline. Reliable studies are summarized in Table 4- 3.

Pseudokirchneriella subcapitata were exposed to **2,3-dimethylaniline** for 72 hours at nominal concentrations of 0, 0.22, 0.46, 1.0, 2.2, 4.6, 10, 22, 46 and 100 mg/L in a test conducted according to OECD TG 201. The measured concentrations were <0.01, 0.21, 0.45, 0.94, 2.19, 4.58, 9.94, 22.1, 46.3 and 95.9 mg/L at the start of the exposure. The 72-hour EC_{50} obtained on the basis of growth rate was 41.4 mg/L (MOE, Japan, 2004c).

A study of **2,3-dimethylaniline** with *Desmodesmus subspicatus* was performed and showed that the extrapolated 48-hour EC_{50} value based on the growth rate was 65 mg/L (Kühn and Pattard, 1990).

No reliable studies were identified for **2,4-dimethylaniline**. The 72-hour EC_{50} values on the basis of growth rate for other category member substances are between 8.59 and > 100 mg/L. The predicted 72-hour EC_{50}, based on read across from the lowest 72-hour EC_{50} (3,4-dimethylaniline), for 2,4-dimethylaniline is 8.59 mg/L. The predicted 96-hour EC_{50}, based on ECOSAR (v 1.00) for 2,4-dimethylaniline and other category members are 5.491 mg/L.

Pseudokirchneriella subcapitata were exposed to **2,5-dimethylaniline** for 72 hours at nominal concentrations of 0, 1.0, 2.2, 4.6, 10, 22, 46 and 100 mg/L in a test conducted according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 201. The mean measured concentrations were <0.02, 0.929, 2.03, 4.28, 9.48, 20.6, 43.5 and 93.8 mg/L. The 72-hour EC_{50} obtained on the basis of growth rate was 30 mg/L (MOE, Japan, 2009c).

Pseudokirchneriella subcapitata were exposed to **2,6-dimethylaniline** for 72 hours at nominal concentrations of 0, 5.6, 10, 18, 32, 56 and 100 mg/L in a test conducted according to OECD TG 201. The mean measured concentrations were <0.01, 5.41, 9.64, 17.5, 31.1, 54.2 and 96.8 mg/L. The 72-hour EC_{50} obtained on the basis of growth rate was > 100 mg/L (MOE, Japan, 2003c).

Pseudokirchneriella subcapitata were exposed to **3,4-dimethylaniline** for 72 hours at nominal concentrations of 0, 1.8, 3.2, 5.6, 10 and 18 mg/L in a test conducted according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 201. The mean measured concentrations were <0.03, 1.60, 2.94, 5.18, 9.46 and 16.9 mg/L. The 72-hour EC_{50} obtained on the basis of growth rate was 8.59 mg/L (MOE, Japan, 2005c).

A study of **3,4-dimethylaniline** with *Desmodesmus subspicatus* was performed and showed that the 48-hour EC_{50} value based on the growth rate was 50 mg/L (Kühn and Pattard, 1990).

Pseudokirchneriella subcapitata were exposed to **3,5-dimethylaniline** for 72 hours at nominal concentrations of 0, 2.0, 3.4, 5.8, 10, 17, 29 and 50 mg/L in a test conducted according to OECD TG 201. The measured concentrations were <0.003, 1.90, 3.22, 5.32, 9.32, 15.9, 26.9 and 46.4 mg/L at the

end of the test (72 hours). The 72-hour EC_{50} obtained on the basis of growth rate was 29.1 mg/L (EA, Japan, 1998d).

Table 4- 3 Summary of Acute Toxicity to Aquatic Plants

Test substance (CAS No.)	Species	Method	Result (mg/L)	Reliability	Reference
2,3-Dimethylaniline (87-59-2)	*Pseudokirchneriella subcapitata*	OECD TG 201 Static	72h EC_{50} = 41.4 growth rate	1	MOE, Japan, 2004c
	Desmodesmus subspicatus		48h EC_{10} = 24 48h EC_{50} = 65[*1] growth rate	2	Kühn and Pattard, 1990
2,4-Dimethylaniline (95-68-1)			72h EC_{50} = 8.59 growth rate		RA[*2]
2,5-Dimethylaniline (95-78-3)	*Pseudokirchneriella subcapitata*	Other Guideline; Chemical Substances Control Law, Japan (equivalent to OECD Guideline 201) Static	72h EC_{50} = 30 growth rate	1	MOE, Japan, 2009c
2,6-Dimethylaniline (87-62-7)	*Pseudokirchneriella subcapitata*	OECD TG 201 Static	72h EC_{50} >100 growth rate	1	MOE, Japan, 2003c
3,4-Dimethylaniline (95-64-7)	*Pseudokirchneriella subcapitata*	Other Guideline; Chemical Substances Control Law, Japan (equivalent to OECD Guideline 201) Static	72h EC_{50} = 8.59 growth rate	1	MOE, Japan, 2005c
	Desmodesmus subspicatus		48h EC_{10} = 17 48h EC_{50} = 50 growth rate	2	Kühn and Pattard, 1990
3,5-Dimethylaniline (108-69-0)	*Pseudokirchneriella subcapitata*	OECD TG 201 Static	72h EC_{50} = 29.1 growth rate	1	EA, Japan, 1998d

[*1]: extrapolated value, [*2]: RA: Read Across

Chronic Toxicity Test Results

Fish

There are no chronic toxicity data on fish.

Invertebrates

Data on the chronic toxicity to aquatic invertebrates are available for category member substances except 2,4-dimethylaniline. Reliable studies are summarized in Table 4- 4.

Daphnia magna were exposed to **2,3-dimethylaniline** at nominal concentration of between 0.02 and 2.5 mg/L for 21 days in a test conducted according to the provisional procedure proposed by Federal Environmental Agency (Umweltbundesamt). As the chemical analysis showed a loss of the test substance of more than 20%, the lowest analysed concentration (minimum value) obtained during the test was given for the NOEC. The 21-day NOEC for reproduction was 0.1 mg/L (Kühn et al., 1989b).

No reliable studies were identified for **2,4-dimethylaniline**. The 21-day NOEC for reproduction of other category member substances are between 0.0095 and 2.23 mg/L. The predicted 21-day NOEC, based on read across from the lowest 21-day NOEC (3,4-dimethylaniline), for 2,4-dimethylaniline is 0.0095 mg/L.

Daphnia magna were exposed to **2,5-dimethylaniline** at nominal concentration of 0, 0.046, 0.10, 0.22, 0.46, 1.0, 2.2 and 4.6 mg/L for 21 days in a test conducted according to OECD TG 211. The time-weighted mean measured concentrations were 0, 0.0424, 0.0958, 0.211, 0.447, 0.981, 2.18 and 4.54 mg/L, respectively. Based on reproduction, the 21-day NOEC was determined to be 0.096 mg/L (MOE, Japan, 2009d).

Daphnia magna were exposed to **2,6-dimethylaniline** at nominal concentration of 0, 1.0, 2.2, 4.6, 10 and 22 mg/L for 21 days in a test conducted according to OECD TG 211. The time-weighted mean measured concentrations were 0, 0.994, 2.23, 4.59, 9.88 and 21.4 mg/L, respectively. Based on reproduction, the 21-day NOEC was determined to be 2.23 mg/L (MOE, Japan, 2003d).

Daphnia magna were exposed to **3,4-dimethylaniline** at nominal concentration of 0, 0.010, 0.032, 0.10, 0.32 and 1.0 mg/L for 21 days in a test conducted according to OECD TG 211. The arithmetic mean measured concentrations were 0, 0.0095, 0.0297, 0.0988, 0.324 and 1.03 mg/L, respectively. Based on reproduction, the 21-day NOEC was determined to be 0.0095 mg/L (MOE, Japan, 2005d).

Daphnia magna were exposed to **3,4-dimethylaniline** at nominal concentration of between 0.02 and 2.5 mg/L for 21 days in a test conducted according to the provisional procedure proposed by Federal Environmental Agency (Umweltbundesamt). As the chemical analysis showed a loss of the test substance of more than 20%, the lowest analysed concentration (minimum value) obtained during the test was given for the NOEC. The 21-day NOEC for reproduction was 0.01 mg/L (Kühn et al., 1989b).

Daphnia magna were exposed to **3,5-dimethylaniline** at nominal concentration of 0, 0.010, 0.030, 0.100, 0.300 and 1.00 mg/L for 21 days in a test conducted according to OECD TG 211. The measured concentrations at the start of the exposure (0 day) were <0.003, 0.011, 0.031, 0.104, 0.316 and 1.06 mg/L, respectively. Based on reproduction, the 21-day NOEC was determined to be 0.03 mg/L (EA, Japan, 1998e).

Table 4- 4 Summary of Chronic Toxicity to Aquatic Invertebrates

Test substance (CAS No.)	Species	Method	Result (mg/L)	Reliability	Reference
2,3-Dimethylaniline (87-59-2)	*Daphnia magna*	Provisional procedure proposed by Federal Environmental Agency (Umweltbundesamt) Semi-static	21d NOEC = 0.1 reproduction	2	Kühn et al., 1989b
2,4-Dimethylaniline (95-68-1)			21d NOEC = 0.0095 reproduction		RA
2,5-Dimethylaniline (95-78-3)	*Daphnia magna*	OECD TG 211 semi-static	21d NOEC = 0.096 reproduction	1	MOE, Japan, 2009d
2,6-Dimethylaniline (87-62-7)	*Daphnia magna*	OECD TG 211 semi-static	21d NOEC = 2.23 reproduction	1	MOE, Japan, 2003d
3,4-Dimethylaniline (95-64-7)	*Daphnia magna*	OECD TG 211 semi-static	21d NOEC = 0.0095 reproduction	1	MOE, Japan, 2005d
	Daphnia magna	Provisional procedure	21d NOEC = 0.01	2	Kühn et al.,

		proposed by Federal Environmental Agency (Umweltbundesamt) Semi-static	reproduction		1989b
3,5-Dimethylaniline (108-69-0)	*Daphnia magna*	OECD TG 211 semi-static	21d NOEC = 0.03 reproduction	1	EA, Japan, 1998e

RA: Read Across

Aquatic plant, e.g. Algae

Data on the chronic toxicity to aquatic plants are available for category member substances except 2,4-dimethylaniline. Reliable studies are summarized in Table 4- 5.

Pseudokirchneriella subcapitata were exposed to **2,3-dimethylaniline** for 72 hours at nominal concentrations of 0, 0.22, 0.46, 1.0, 2.2, 4.6, 10, 22, 46 and 100 mg/L in a test conducted according to OECD TG 201. The measured concentrations were <0.01, 0.21, 0.45, 0.94, 2.19, 4.58, 9.94, 22.1, 46.3 and 95.9 mg/L at the start of the exposure. The 72-hour NOEC obtained on the basis of growth rate was 4.32 mg/L (MOE, Japan, 2004c).

No reliable studies were identified for **2,4-dimethylaniline**. The 72-hour NOEC values on the basis of growth rate for other category member substances are between 2.0 and 5.8 mg/L. The predicted 72-hour NOEC, based on read across from the lowest 72-hour NOEC (2,5-dimethylaniline), for 2,4-dimethylaniline is 2.0 mg/L.

Pseudokirchneriella subcapitata were exposed to **2,5-dimethylaniline** for 72 hours at nominal concentrations of 0, 1.0, 2.2, 4.6, 10, 22, 46 and 100 mg/L in a test conducted according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 201. The mean measured concentrations were <0.02, 0.929, 2.03, 4.28, 9.48, 20.6, 43.5 and 93.8 mg/L. The 72-hour NOEC obtained on the basis of growth rate was 2 mg/L (MOE, Japan, 2009c).

Pseudokirchneriella subcapitata were exposed to **2,6-dimethylaniline** for 72 hours at nominal concentrations of 0, 5.6, 10, 18, 32, 56 and 100 mg/L in a test conducted according to OECD TG 201. The mean measured concentrations were <0.01, 5.41, 9.64, 17.5, 31.1, 54.2 and 96.8 mg/L; the detection limit was 0.01 mg/L. The 72-hour NOEC obtained on the basis of growth rate was 32 mg/L (MOE, Japan, 2003c).

Pseudokirchneriella subcapitata were exposed to **3,4-dimethylaniline** for 72 hours at nominal concentrations of 0, 1.8, 3.2, 5.6, 10 and 18 mg/L in a test conducted according to National Guideline (Chemical Substances Control Law, Japan) equivalent to OECD TG 201. The mean measured concentrations were <0.03, 1.60, 2.94, 5.18, 9.46 and 16.9 mg/L. The 72-hour NOEC obtained on the basis of growth rate was 2.94 mg/L (MOE, Japan, 2005c).

Pseudokirchneriella subcapitata were exposed to **3,5-dimethylaniline** for 72 hours at nominal concentrations of 0, 2.0, 3.4, 5.8, 10, 17, 29 and 50 mg/L in a test conducted according to OECD TG 201. The measured concentrations were <0.003, 1.90, 3.22, 5.32, 9.32, 15.9, 26.9 and 46.4 mg/L at the end of the test (72 hours); the detection limit was 0.003 mg/L. The 72-hour NOEC obtained on the basis of growth rate was 5.8 mg/L (EA, Japan, 1998d).