

## MIRAI MR04-02 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

[ReadMe](#) [Observation Data](#) [Data Format](#) [Quality Information](#)

Cruise ID: [MR04-02](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Silicate, Nitrate, Nitrite, Phosphate, Ammonia, Total inorganic carbon, Alkalinity, Potential temperature, Density

Science Keywords:

OCEANS > OCEAN CHEMISTRY > AMMONIA  
OCEANS > OCEAN CHEMISTRY > INORGANIC CARBON  
OCEANS > OCEAN CHEMISTRY > NITRITE  
OCEANS > OCEAN CHEMISTRY > NITRATE  
OCEANS > OCEAN CHEMISTRY > NUTRIENTS  
OCEANS > OCEAN CHEMISTRY > OXYGEN  
OCEANS > OCEAN CHEMISTRY > PHOSPHATE  
OCEANS > OCEAN CHEMISTRY > SILICATE  
OCEANS > OCEAN CHEMISTRY > SALINITY  
OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE  
OCEANS > SALINITY/DENSITY > SALINITY  
OCEANS > OCEAN CHEMISTRY > ALKALINITY  
OCEANS > OCEAN CHEMISTRY > CARBON  
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

Cruise Report

[http://www.godac.jamstec.go.jp/catalog/data/doc\\_catalog/media/MR04-02\\_all.pdf](http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR04-02_all.pdf)

### [For Using Data](#)

#### Principal Investigator

CTDTMP : Makio Honda (JAMSTEC)  
CTDSAL : Makio Honda (JAMSTEC)  
SALNTY : Makio Honda (JAMSTEC)  
OXYGEN : Makio Honda (JAMSTEC)  
SILCAT : Makio Honda (JAMSTEC)  
NITRAT : Makio Honda (JAMSTEC)  
NITRIT : Makio Honda (JAMSTEC)  
PHSPHT : Makio Honda (JAMSTEC)  
NH4 : Makio Honda (JAMSTEC)  
TCARBN : Makio Honda (JAMSTEC)  
ALKALI : Makio Honda (JAMSTEC)

#### Use Constraints

See [Terms and Conditions](#) about constrain of use.

#### Data Citation

See [Terms and Conditions](#) about data citation.

### Instrument

Instrument:

Salinity measurement system



Instrument:

Nutrient analyzer(4ch) ( - MR09-01)



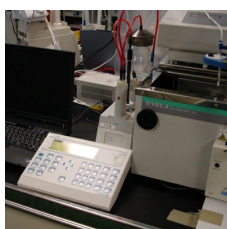
Instrument:

Total dissolved inorganic carbon measurement system ( - MR11-E02)



Instrument:

Titration for total alkalinity ( - MR14-02)



### Notice

The values of TA, silicate, and phosphate have systematic errors among cruises, because the analytical methods used for these determinations, and the precision and standards for analysis varied slightly from cruise to cruise. The dataset posted here is "corrected" in a cruise. If you need the corrected data for systematic errors among cruises, please see ["Hydrographic Data at Station K2 and KNOT"](#) . (Available data are station K2 and KNOT data only.)

### Information on CTD data

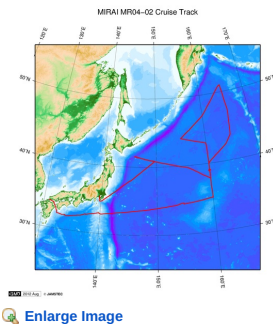
(1) Temperature sensor

Model: SBE3, Sea-Bird Electronics, Inc.  
Measurement range: -5.0 to +35degC  
Accuracy: 0.001degC  
Resolution: 0.0002degC  
(2) Salinity sensor  
Model: SBE4, Sea-Bird Electronics, Inc.  
Measurement range: 0.0 to 7S/m  
Accuracy: 0.0003S/m  
Resolution: 0.00004S/m  
(3) Pressure sensor  
Model: SBE9plus, Sea-Bird Electronics, Inc.  
Measurement range: up to 10500m  
Accuracy: 0.015%F.S.  
Resolution: 0.001%F.S.

**Information on Chemical and Biological data**

1. Dissolved Oxygen  
(1) Instruments: Burette: APB-510 manufactured by Kyoto Electronic Co. Ltd. / 10 cm<sup>3</sup> of titration vessel  
Detector and Software: Automatic photometric titrator manufactured by Kimoto Electronic Co. Ltd  
(2) Methods: Winkler method/photometric methods  
(3) Precision: 0.11 umol kg<sup>-1</sup>  
(4) Reference Material/Calibration: 0.001667M KIO<sub>3</sub> solution
2. Salinity  
(1) Instruments: Autosol salinometer model 8400B (Guildline Instruments Ltd.)  
(2) Methods: -  
(3) Precision: 0.00014 PSU  
(4) Reference Material/Calibration: IAPSO Standard Sea Water batch P143 (Ocean Scientific International Ltd.)
3. Silicate  
(1) Instruments: TRAACS800 (Bran+Luebbe)  
(2) Methods: Molybdenum blue method  
(3) Precision: C.V. 0.20% (201 uM)  
(4) Reference Material/Calibration: -
4. Nitrate  
(1) Instruments: TRAACS800 (Bran+Luebbe)  
(2) Methods: Diazotization method (reduced to nitrite by Cd-Cu tube)  
(3) Precision: C.V. 0.23% (54 uM),  
(4) Reference Material/Calibration: -
5. Nitrite  
(1) Instruments: TRAACS800 (Bran+Luebbe)  
(2) Methods: Diazotization method  
(3) Precision: C.V. 0.22% (1.6 uM)  
(4) Reference Material/Calibration: -
6. Phosphate  
(1) Instruments: TRAACS800 (Bran+Luebbe)  
(2) Methods: Molybdenum blue method  
(3) Precision: C.V. 0.16% (3.7 uM),  
(4) Reference Material/Calibration: -
7. Ammonia  
(1) Instruments: TRAACS800 (Bran+Luebbe)  
(2) Methods: Indophenol method/gas diffusion method (GDM)  
(3) Precision: C.V. 0.35% (3.2 uM)  
(4) Reference Material/Calibration: -
8. Total inorganic carbon  
(1) Instruments: the automated TCO<sub>2</sub> analyzer (Nippon ANS, Inc.) equipped with carbon coulometer 5012 (UIC Inc.)  
(2) Methods: coulometry  
(3) Precision: 0.7 umol kg<sup>-1</sup>  
(4) Reference Material/Calibration: Na<sub>2</sub>CO<sub>3</sub> solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography
9. Total Alkalinity  
(1) Instruments: auto-burette (Radiometer, ABU901), a pH glass electrode (Radiometer, pHG201-7), a reference electrode (Radiometer, REF201)  
(2) Methods: Modified Gran titration/Closed-cell/potentiometry  
(3) Precision: 1.4 umol kg<sup>-1</sup>  
(4) Reference Material/Calibration: Na<sub>2</sub>CO<sub>3</sub> solution and the CRM provided by Dr. Dickson in Scripps Institute of Oceanography

**Related Information**



**MR04-02**  
Ship Name: MIRAI  
Period: 2004-03-26 - 2004-04-16  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

#### Update History

2017-07-28	An observation data was registerd.
2015-05-29	An observation data was registerd.
2013-08-23	An observation data was registerd.
2012-11-25	An observation data was registerd.

#### JAMSTEC

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#### Lists

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#### Information of the Ships

NATSUSHIMA  
KAIYO  
YOKOSUKA  
MIRAI  
KAIREI  
CHIKYU  
KAIMEI  
SHINSEI MARU  
HAKUHO MARU

#### Information of the Submersibles

KAIKO  
SHINKAI 2000  
SHINKAI 6500  
DEEP TOW  
HYPER-DOLPHIN  
URASHIMA  
YOKOSUKA DEEP TOW  
6K Camera DEEP TOW  
6K Sonar DEEP TOW  
KM-ROV  
POWER GRAB SAMPLER (SHELL)  
POWER GRAB SAMPLER (CLOW)  
BMS

#### Go to a Cruise Information

Cruise ID:

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Dive ID:



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Bottle Sampling Water Chemical Analysis: Processed (PI)

Data Policy: [JAMSTEC](#)

### Exchange Format

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office).

Please see the following link for details of Exchange Format.

[CCHDO | CLIVAR & Carbon Hydrographic Data Office](#)

Format Information

Column No.	Column Heading Mnemonic	Units Mnemonic	Reporting Precision FORTRAN Format	Comments
1	EXPCODE		A14	Expedition code
2	SECT		A6	For WOCE data the WHP section identifier
3	STNNBR		A6	Station number
4	CASTNO		I3	Cast number
5	SAMPNO		A7	Sample number
6	BTLNBR		A7	Bottle identification number
7	BTLNBR_FLAG_W		I1	Bottle quality flag
8	DATE		I8	Cast date(UTC)
9	TIME	UTC	I4	Cast time (UTC)
10	LATITUDE	DEG	F8.3	LATITUDE
11	LONGITUDE	DEG	F9.3	LONGITUDE
12	DEPTH	M	I5	Reported depth to bottom.
13	CTDDPT	M	F9.1	Depth
14	CTDDPT_FLAG_W		I1	Quality flag for CTD data
15	CTDPRS	DBAR	F9.1	Pressure
16	CTDPRS_FLAG_W		I1	Quality flag for CTD data
17	CTDTMP	ITS-90	F9.4	Temperature
18	CTDTMP_FLAG_W		I1	Quality flag for CTD data
19	CTDSAL	PSS-78	F9.4	CTD Salinity sensor
20	CTDSAL_FLAG_W		I1	Quality flag for CTD data
21	SALNTY	PSS-78	F9.4	Salinity
22	SALNTY_FLAG_W		I1	Quality flags for water samples
23	OXYGEN	UMOL/KG	F9.2	Oxygen
24	OXYGEN_FLAG_W		I1	Quality flags for water samples
25	SILCAT	UMOL/KG	F9.2	Silicate
26	SILCAT_FLAG_W		I1	Quality flags for water samples
27	NITRAT	UMOL/KG	F9.2	Nitrate
28	NITRAT_FLAG_W		I1	Quality flags for water samples
29	NITRIT	UMOL/KG	F9.2	Nitrite
30	NITRIT_FLAG_W		I1	Quality flags for water samples
31	PHSPHT	UMOL/KG	F9.2	Phosphate
32	PHSPHT_FLAG_W		I1	Quality flags for water samples
33	NH4	UMOL/KG	F9.2	Ammonium
34	NH4_FLAG_W		I1	Quality flags for water samples
35	TCARBN	UMOL/KG	F9.1	Total carbon
36	TCARBN_FLAG_W		I1	Quality flags for water samples
37	ALKALI	UMOL/KG	F9.1	Total alkalinity
38	ALKALI_FLAG_W		I1	Quality flags for water samples
39	THETA	DEG C	F9.4	Potential temperature
40	SIG0	KG/CUM	F9.4	Density

### ODV Format

Please see the following link for details of ODV Format and ODV Software.

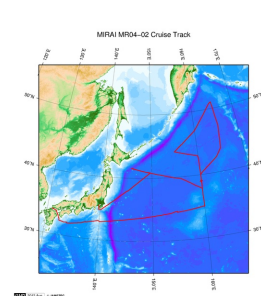
[Ocean Data View \(ODV\)](#)

Format Information

Column No.	Column Heading	Comments
1	Cruise	Cruise Label
2	Station	Station number_Cast number
3	Type	Station type
4	mon/day/yr	Cast date(UTC)
5	hh:mm	Cast time (UTC)
6	Latitude [degrees_north]	LATITUDE
7	Longitude [degrees_east]	LONGITUDE
8	Bot. Depth [m]	Reported depth to bottom.
9	CTDDPT[M]	Depth
10	QF	Quality flag for CTD data
11	CTDPRS[DBAR]	Pressure
12	QF	Quality flag for CTD data
13	CTDTMP[ITS-90]	Temperature
14	QF	Quality flag for CTD data
15	CTDSAL[PSS-78]	CTD Salinity sensor
16	QF	Quality flag for CTD data
17	SALNTY[PSS-78]	Salinity
18	QF	Quality flags for water samples
19	OXYGEN[UMOL/KG]	Oxygen

Column No.	Column Heading	Comments
20	QF	Quality flags for water samples
21	SILCAT[UMOL/KG]	Silicate
22	QF	Quality flags for water samples
23	NITRAT[UMOL/KG]	Nitrate
24	QF	Quality flags for water samples
25	NITRIT[UMOL/KG]	Nitrite
26	QF	Quality flags for water samples
27	PHSPHT[UMOL/KG]	Phosphate
28	QF	Quality flags for water samples
29	NH4[UMOL/KG]	Ammonium
30	QF	Quality flags for water samples
31	TCARBN[UMOL/KG]	Total carbon
32	QF	Quality flags for water samples
33	ALKALI[UMOL/KG]	Total alkalinity
34	QF	Quality flags for water samples
35	THETA[DEG C]	Potential temperature
36	QF	Quality flag for CTD data
37	SIG0[KG/CUM]	Density
38	QF	Quality flag for CTD data
39	SAMPNO	Sample number
40	QF	Bottle quality flag

#### Related Information



[Enlarge Image](#)

#### MR04-02

Ship Name: MIRAI  
Period: 2004-03-26 - 2004-04-16  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

#### Update History

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YOKOSUKA DEEP TOW  
6K Camera DEEP TOW  
6K Sonar DEEP TOW  
KM-ROV  
POWER GRAB  
SAMPLER (SHELL)  
POWER GRAB  
SAMPLER (CLOW)  
BMS

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Cruise ID:

#### Go to a Dive Information

Dive ID:

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**JAMSTEC**  
JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

国立研究開発法人  
海洋研究開発機構

## MIRAI MR04-02 Bottle Sampling Water Chemical Analysis

Last Modified: 2017-07-28

[ReadMe](#) [Observation Data](#) [Data Format](#) [Quality Information](#)

Cruise ID: [MR04-02](#)

Bottle Sampling Water Chemical Analysis: Processed (PI)

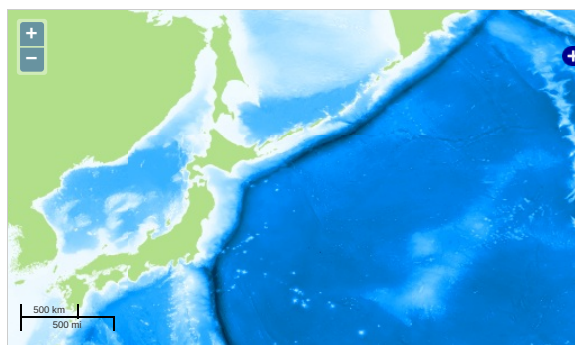
Data Policy: [JAMSTEC](#)

Observation Items: Temperature, Salinity, Dissolved oxygen, Silicate, Nitrate, Nitrite, Phosphate, Ammonia, Total inorganic carbon, Alkalinity, Potential temperature, Density

Science Keywords:

OCEANS > OCEAN CHEMISTRY > AMMONIA  
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OCEANS > SALINITY/DENSITY > SALINITY  
OCEANS > OCEAN CHEMISTRY > ALKALINITY  
OCEANS > OCEAN CHEMISTRY > CARBON  
OCEANS > OCEAN TEMPERATURE > POTENTIAL TEMPERATURE

### Observation Map



... Observation Line ... Navigation ... Observation, Dive Point, Hole

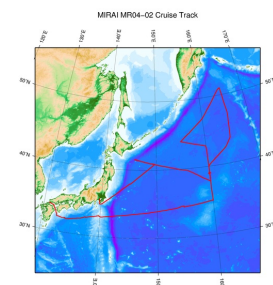
### Data List

☐ File names

☐ MR040200\_ex\_bot.csv

☐ MR040200\_odv\_bot.txt

### Related Information



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#### MR04-02

Ship Name: MIRAI  
Period: 2004-03-26 - 2004-04-16  
Chief Scientist: Makio Honda (JAMSTEC)  
Project Name: [Station K2, Station KNOT]

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[6K Camera DEEP TOW](#)  
[6K Sonar DEEP TOW](#)  
[KM-ROV](#)  
[POWER GRAB SAMPLER \(SHELL\)](#)  
[POWER GRAB SAMPLER \(CLOW\)](#)  
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Dive ID:

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