

2,4-ペンタンジオンのラットを用いた
吸入によるがん原性試験報告書

試験番号：0675

APPENDICES

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2,4-PENTANEDIONE

APPENDIX 1-1

IDENTITY OF 2,4-PENTANEDIONE
IN THE 2-YEAR INHALATION STUDY

IDENTITY OF 2,4-PENTANEDIONE IN THE 2-YEAR INHALATION STUDY

Test Substance : 2,4-Pentanedione (Wako Pure Chemical Industries, Ltd.)

A. Lot No. : DPG0995

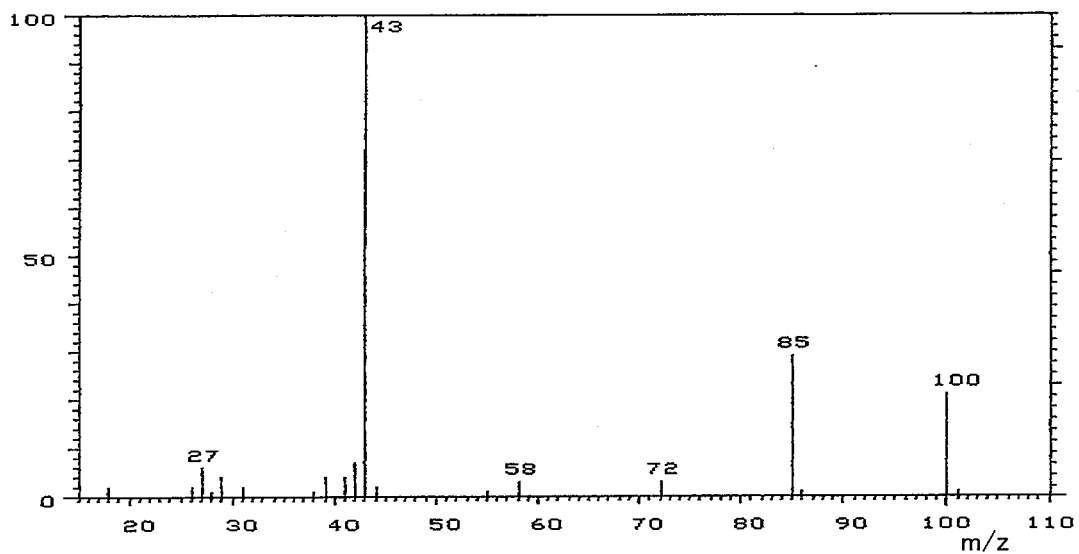
1. Spectral Data

Mass Spectrometry

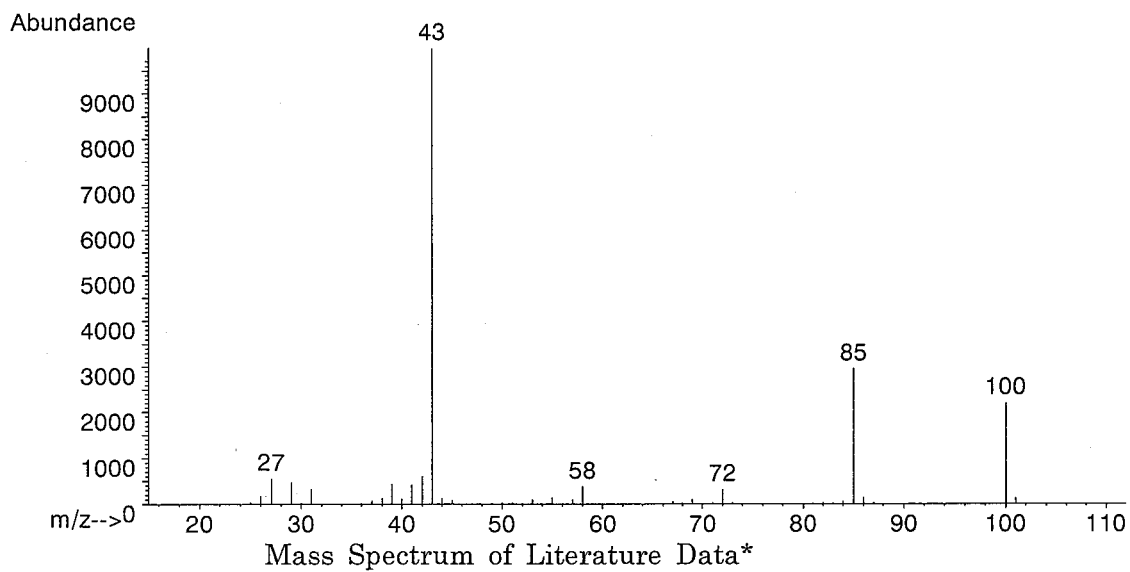
Instrument : Hitachi M-80B Mass Spectrometer

Ionization : EI (Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of Test Substance



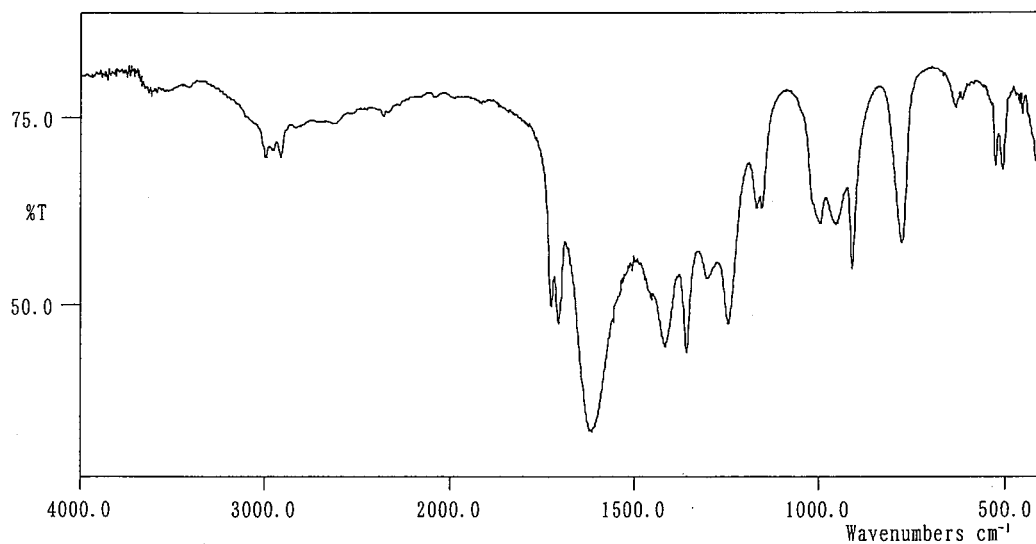
Result: The mass spectrum was consistent with literature spectrum.

(*McLafferty FW, ed. 1994. Wiley Registry of Mass Spectral Data. 6th ed. New York, NY:John Wiley and Sons.)

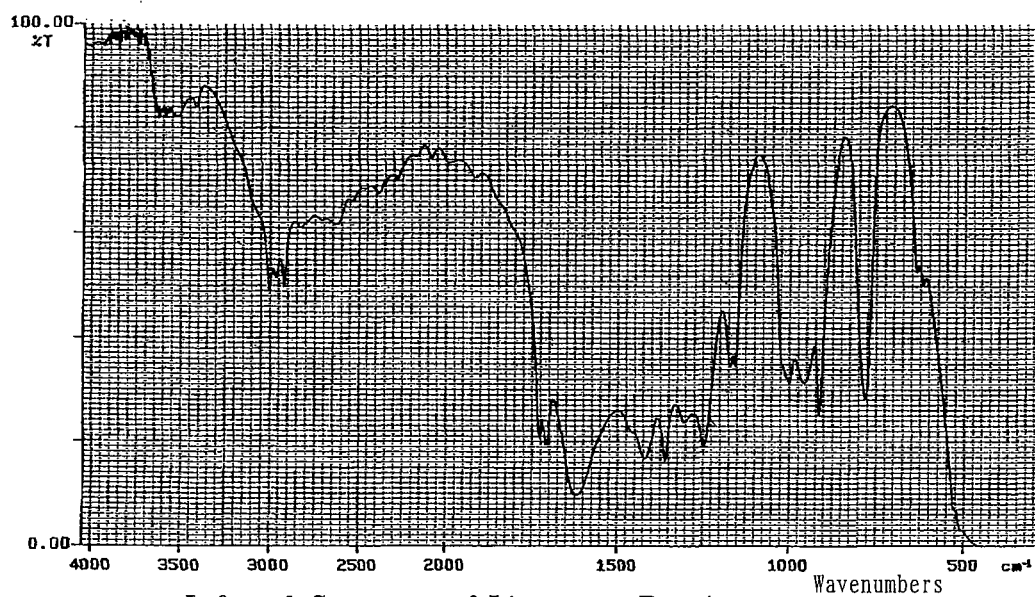
Infrared Spectrometry

Instrument : Shimadzu FTIR-8200PC Infrared Spectrometer

Cell : KBr Liquid Cell

Resolution : 4 cm^{-1} 

Infrared Spectrum of Test Substance



Infrared Spectrum of Literature Data*

Result: The infrared spectrum was consistent with literature spectrum.

(*Performed by Wako Pure Chemical Industries, Ltd.)

2. Conclusion: The test substance was identified as 2,4-pentanedione by mass spectrum and infrared spectrum.

B. Lot No. : DPG1369

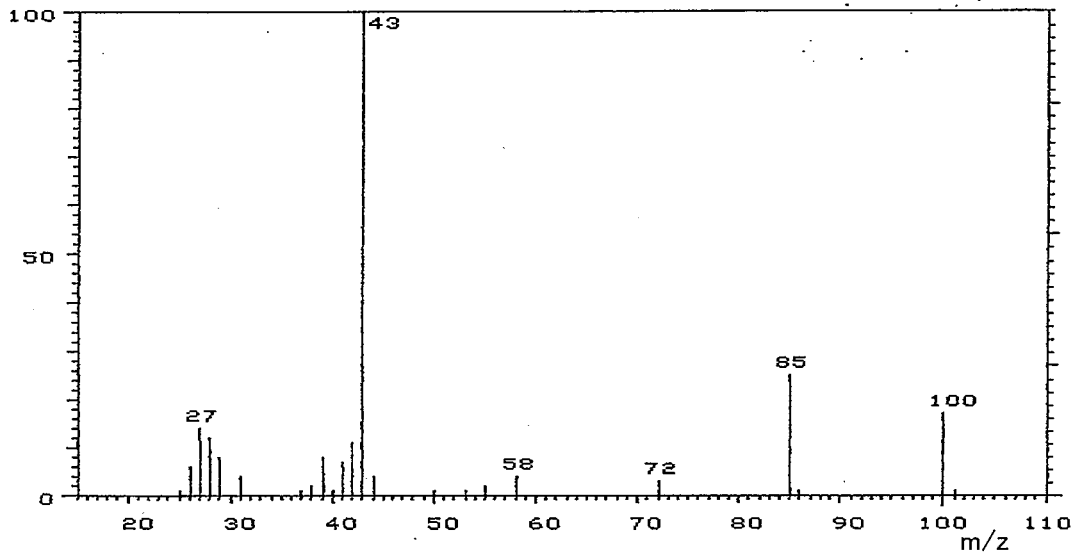
1. Spectral Data

Mass Spectrometry

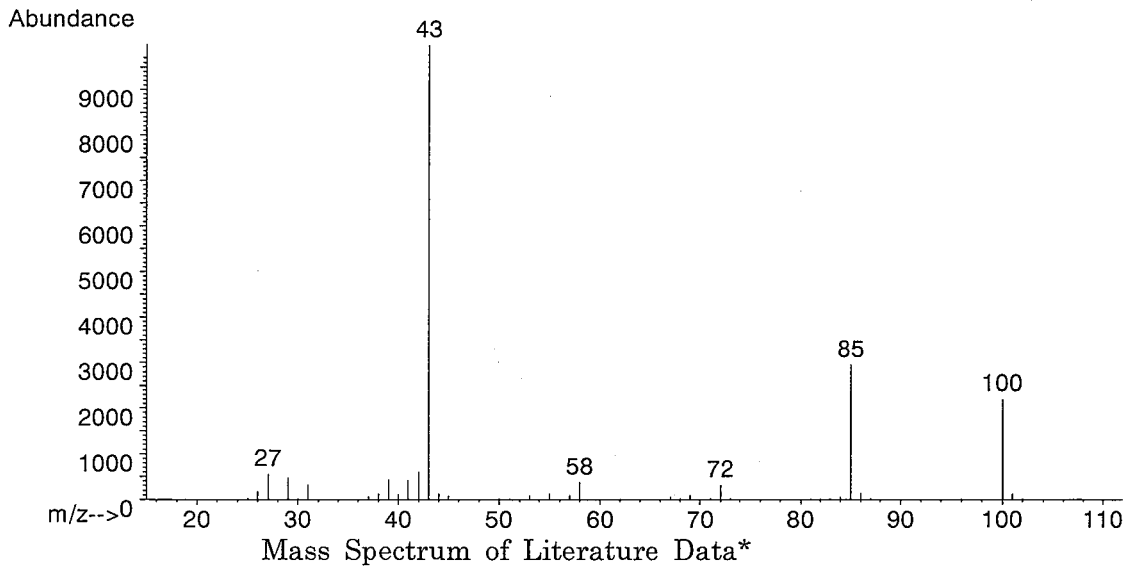
Instrument : Hitachi M-80B Mass Spectrometer

Ionization : EI (Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of Test Substance



Mass Spectrum of Literature Data*

Result: The mass spectrum was consistent with literature spectrum.

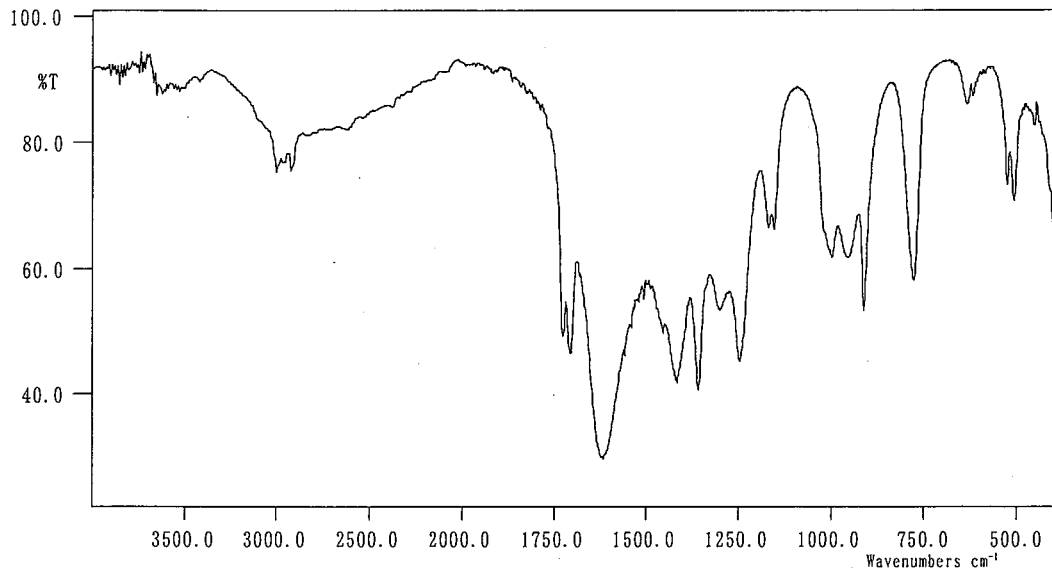
(*McLafferty FW, ed. 1994. Wiley Registry of Mass Spectral Data. 6th ed. New York, NY:John Wiley and Sons.)

Infrared Spectrometry

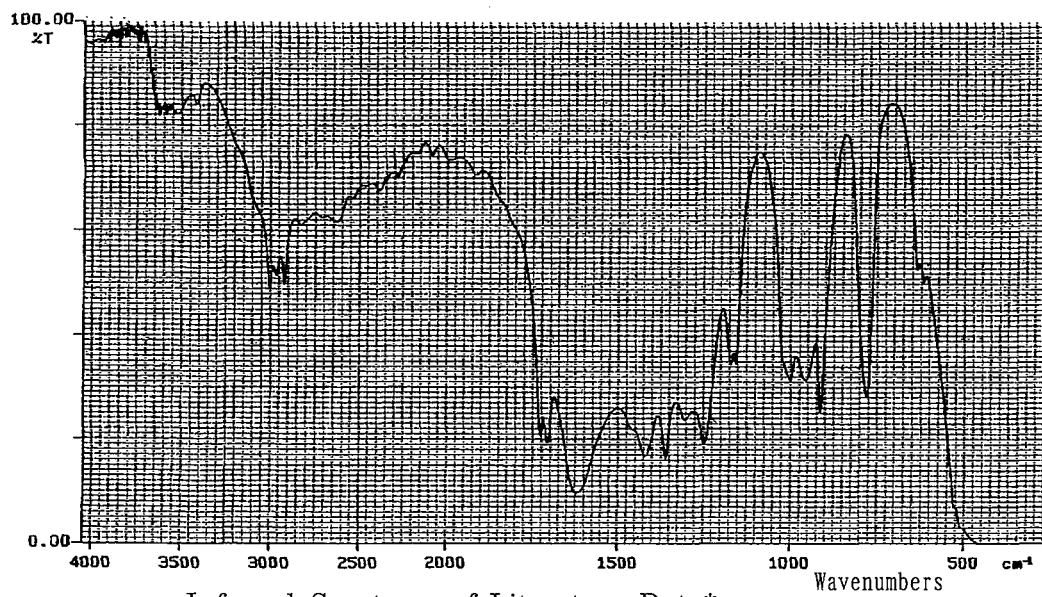
Instrument : Shimadzu FTIR-8200PC Infrared Spectrometer

Cell : KBr Liquid Cell

Resolution : 4 cm^{-1}



Infrared Spectrum of Test Substance



Infrared Spectrum of Literature Data*

Result: The infrared spectrum was consistent with literature spectrum.

(*Performed by Wako Pure Chemical Industries, Ltd.)

2. Conclusion: The test substance was identified as 2,4-pentanedione by mass spectrum and infrared spectrum.

C. Lot No. : TSK2532

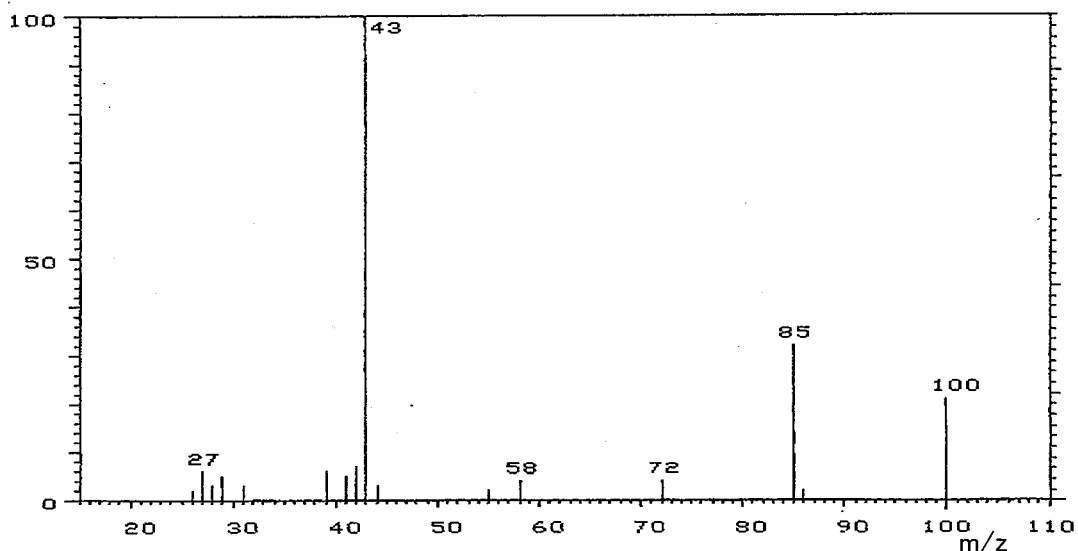
1. Spectral Data

Mass Spectrometry

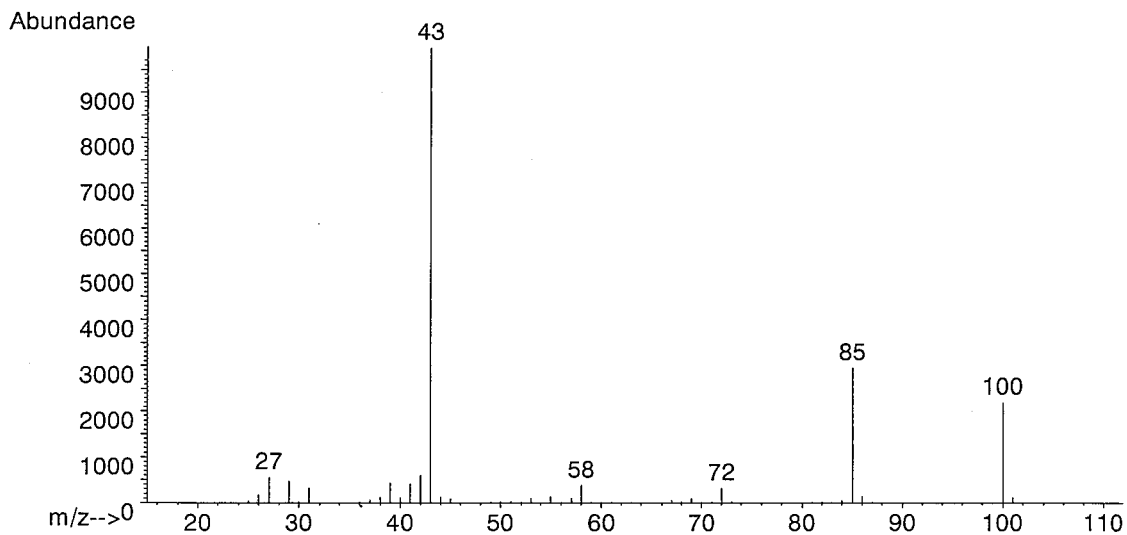
Instrument : Hitachi M-80B Mass Spectrometer

Ionization : EI (Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of Test Substance



Mass Spectrum of Literature Data*

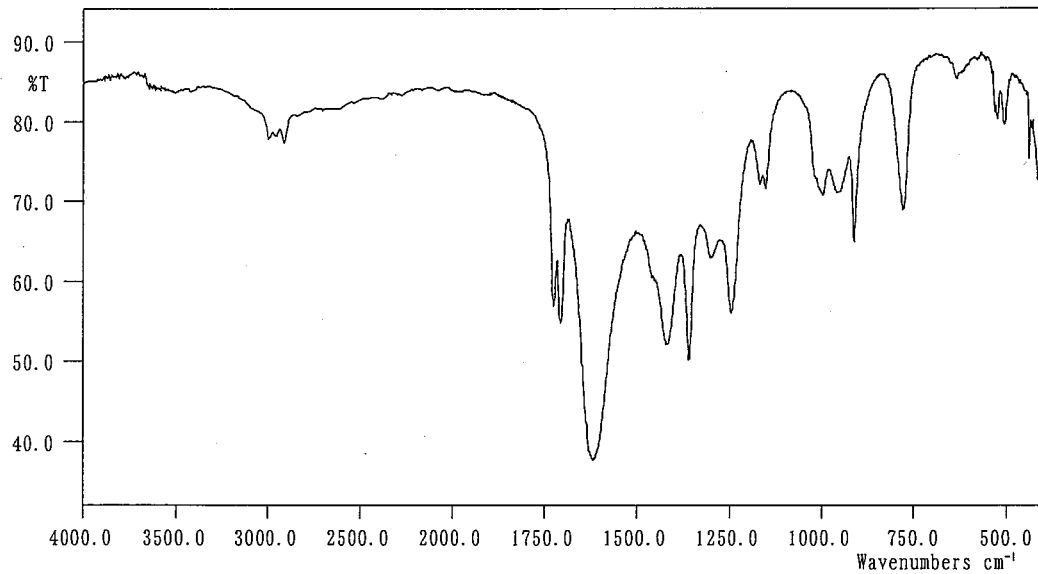
Result: The mass spectrum was consistent with literature spectrum.

(*McLafferty FW, ed. 1994. Wiley Registry of Mass Spectral Data. 6th ed. New York, NY:John Wiley and Sons.)

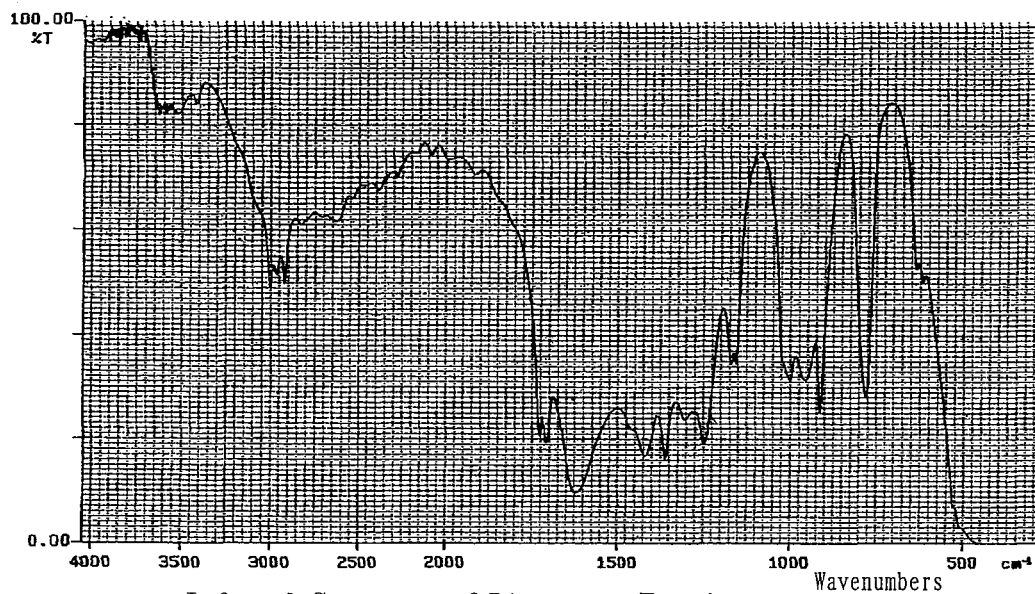
Infrared Spectrometry

Instrument : Shimadzu FTIR-8200PC Infrared Spectrometer

Cell : KBr Liquid Cell

Resolution : 4 cm^{-1} 

Infrared Spectrum of Test Substance



Infrared Spectrum of Literature Data*

Result: The infrared spectrum was consistent with literature spectrum.

(*Performed by Wako Pure Chemical Industries, Ltd.)

2. Conclusion: The test substance was identified as 2,4-pentanedione by mass spectrum and infrared spectrum.

D. Lot No. : ALQ3659

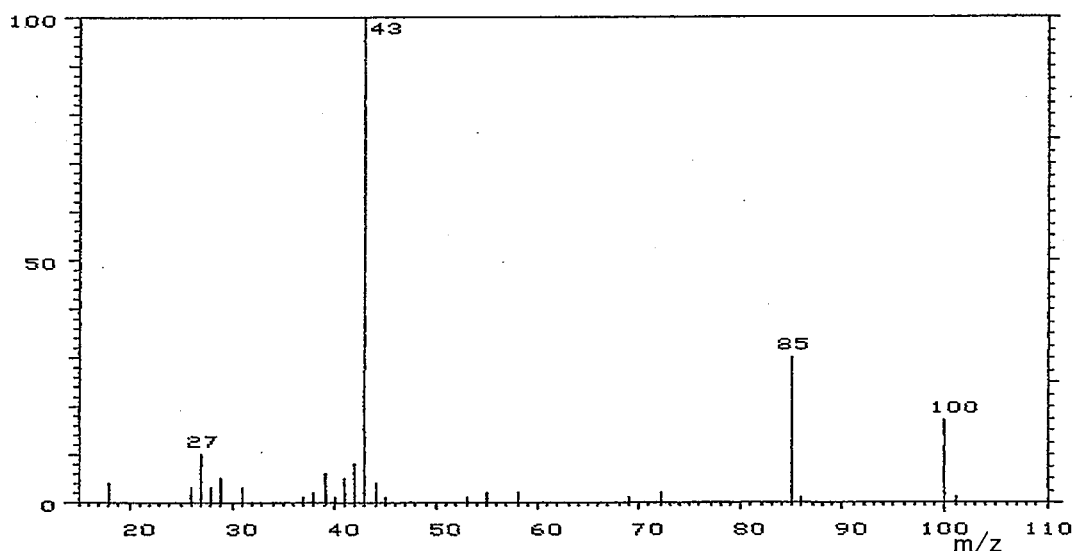
1. Spectral Data

Mass Spectrometry

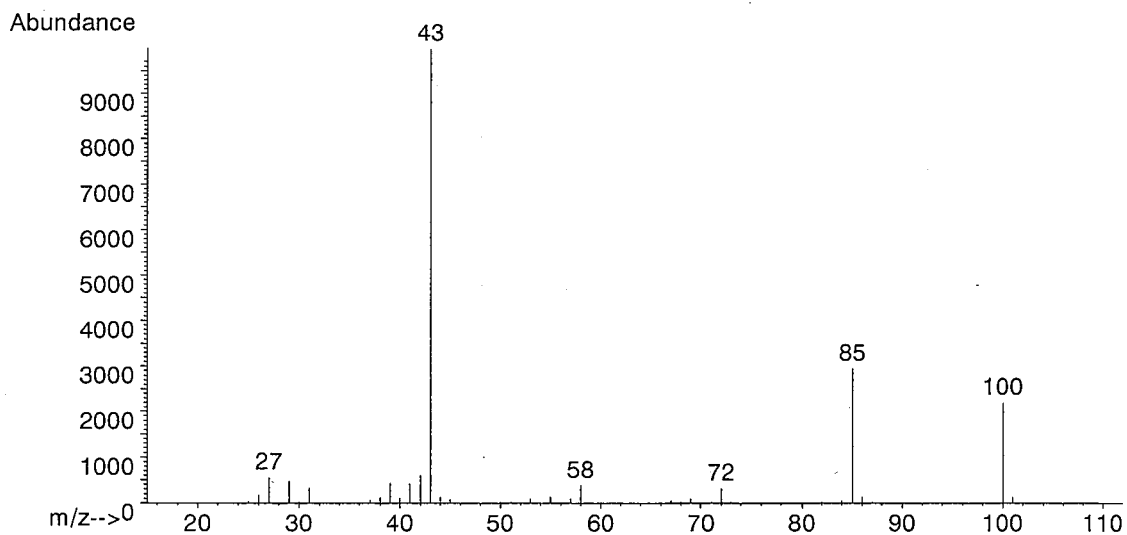
Instrument : Hitachi M-80B Mass Spectrometer

Ionization : EI (Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of Test Substance



Mass Spectrum of Literature Data*

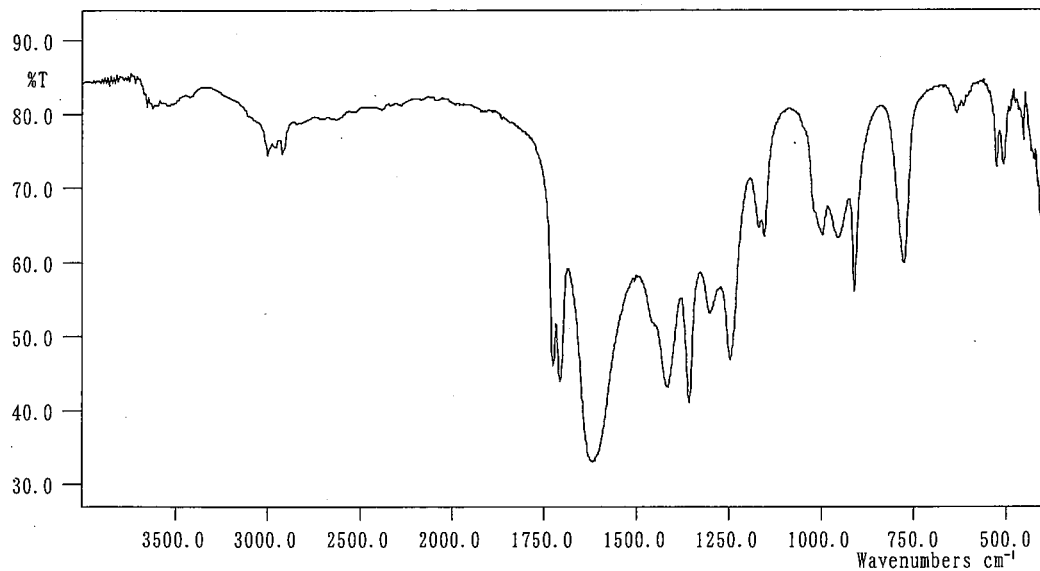
Result: The mass spectrum was consistent with literature spectrum.

(*McLafferty FW, ed. 1994. Wiley Registry of Mass Spectral Data. 6th ed. New York, NY:John Wiley and Sons.)

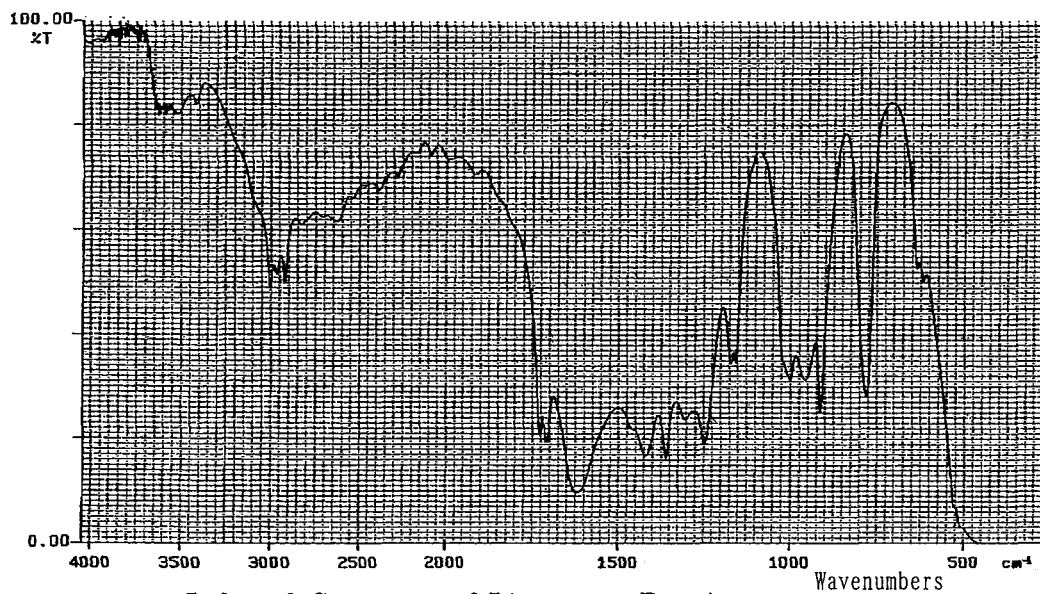
Infrared Spectrometry

Instrument : Shimadzu FTIR-8200PC Infrared Spectrometer

Cell : KBr Liquid Cell

Resolution : 4 cm^{-1} 

Infrared Spectrum of Test Substance



Infrared Spectrum of Literature Data*

Result: The infrared spectrum was consistent with literature spectrum.

(*Performed by Wako Pure Chemical Industries, Ltd.)

2. Conclusion: The test substance was identified as 2,4-pentanedione by mass spectrum and infrared spectrum.

E. Lot No. : ALL1711

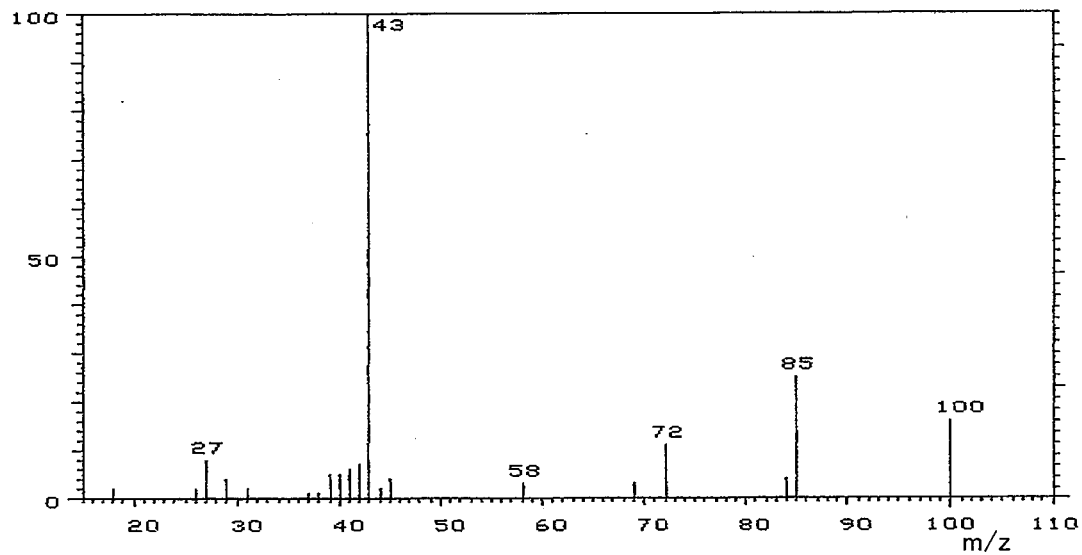
1. Spectral Data

Mass Spectrometry

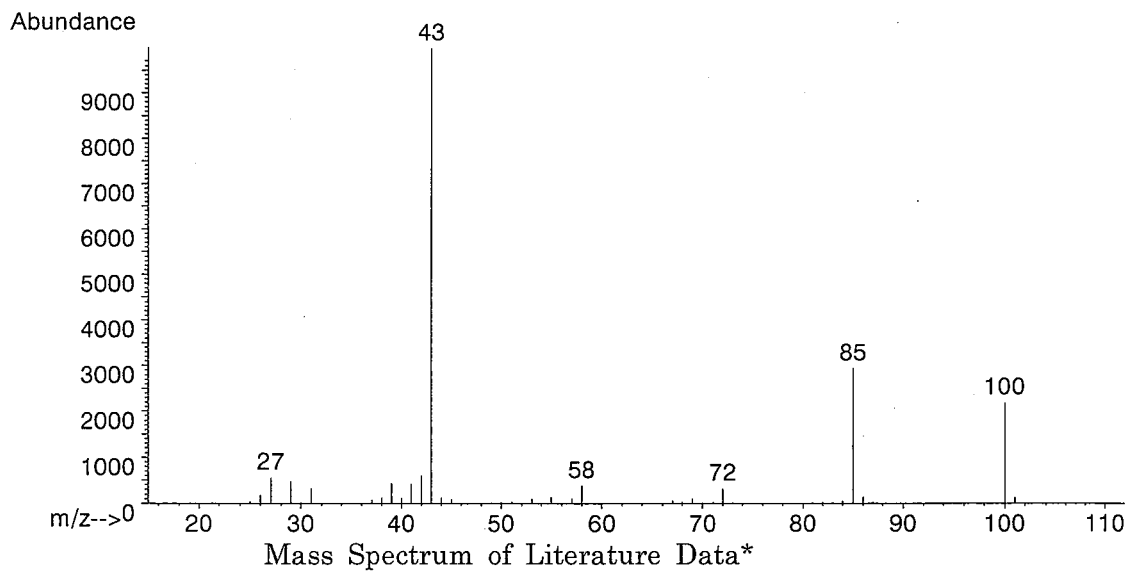
Instrument : Hitachi M-80B Mass Spectrometer

Ionization : EI (Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of Test Substance



Mass Spectrum of Literature Data*

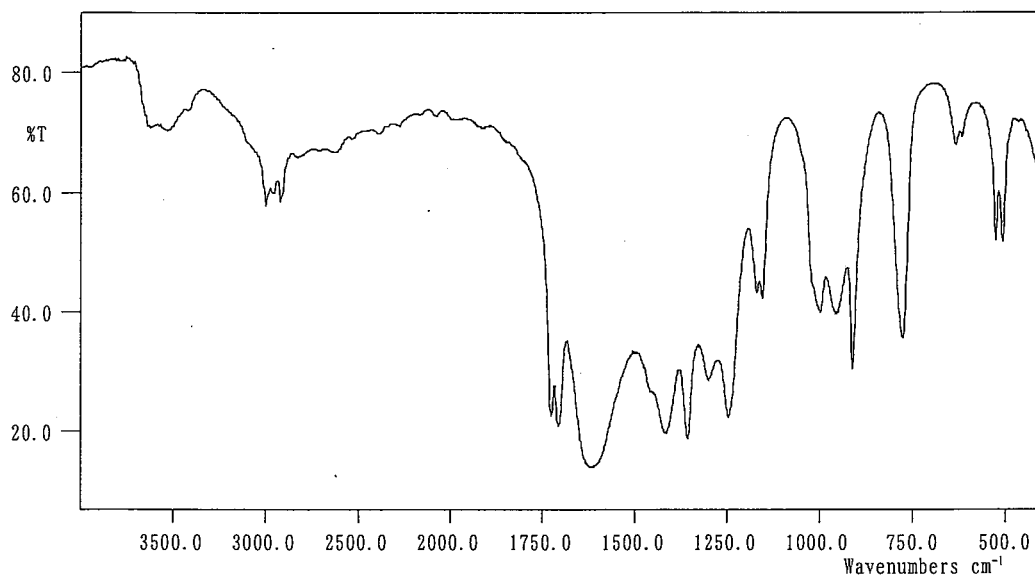
Result: The mass spectrum was consistent with literature spectrum.

(*McLafferty FW, ed. 1994. Wiley Registry of Mass Spectral Data. 6th ed. New York, NY:John Wiley and Sons.)

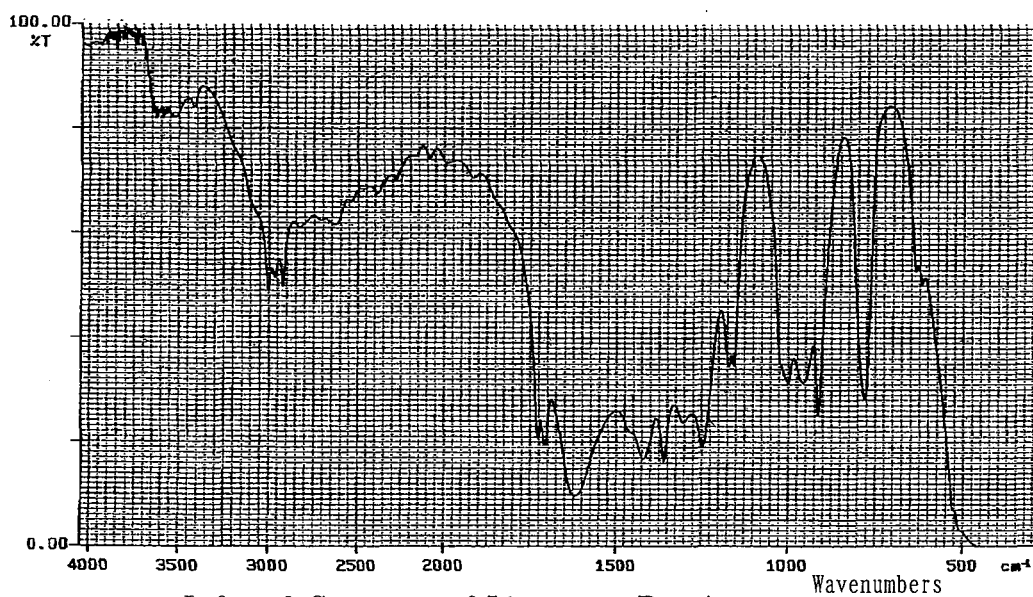
Infrared Spectrometry

Instrument : Shimadzu FTIR-8200PC Infrared Spectrometer

Cell : KBr Liquid Cell

Resolution : 4 cm^{-1} 

Infrared Spectrum of Test Substance



Infrared Spectrum of Literature Data*

Result: The infrared spectrum was consistent with literature spectrum.

(*Performed by Wako Pure Chemical Industries, Ltd.)

2. Conclusion: The test substance was identified as 2,4-pentanedione by mass spectrum and infrared spectrum.

APPENDIX 1-2

STABILITY OF 2,4-PENTANEDIONE
IN THE 2-YEAR INHALATION STUDY

STABILITY OF 2,4-PENTANEDIONE IN THE 2-YEAR INHALATION STUDY

Test Substance : 2,4-Pentanedione (Wako Pure Chemical Industries, Ltd.)

A. Lot No. : DPG0995

1. Gas Chromatography

Instrument : Agilent Technologies 5890A Gas Chromatograph

Column : INNOWAX (0.53 mm ϕ \times 60 m)

Column Temperature: 150° C

Flow Rate : 3 mL/min

Detector : FID (Flame Ionization Detector)

Injection Volume : 1 μ L

Date (date analyzed)	Peak No.	Retention Time (min)	Area (%)
2006.12.21	1	5.760	100
2007.05.18	1	5.771	100

Result: Gas chromatography indicated one major peak (peak No.1) analyzed on 2006.12.21 and one major peak (peak No.1) analyzed on 2007.5.18. No new trace impurity peak in the test substance analyzed on 2007.5.18 was detected.

2. Conclusion: The test substance was stable for the period that the test substance had been used for the study.

B. Lot No. : DPG1369

1. Gas Chromatography

Instrument : Agilent Technologies 5890A Gas Chromatograph

Column : INNOWAX (0.53 mm ϕ \times 60 m)

Column Temperature: 150° C

Flow Rate : 3 mL/min

Detector : FID (Flame Ionization Detector)

Injection Volume : 1 μ L

Date (date analyzed)	Peak No.	Retention Time (min)	Area (%)
2007.05.01	1	5.761	100
2007.09.14	1	5.768	100

Result: Gas chromatography indicated one major peak (peak No.1) analyzed on 2007.5.1 and one major peak (peak No.1) analyzed on 2007.9.14. No new trace impurity peak in the test substance analyzed on 2007.9.14 was detected.

2. Conclusion: The test substance was stable for the period that the test substance had been used for the study.

C. Lot No. : TSK2532

1. Gas Chromatography

Instrument : Agilent Technologies 5890A Gas Chromatograph

Column : INNOWAX (0.53 mm ϕ \times 60 m)

Column Temperature: 150° C

Flow Rate : 3 mL/min

Detector : FID (Flame Ionization Detector)

Injection Volume : 1 μ L

Date (date analyzed)	Peak No.	Retention Time (min)	Area (%)
2007.09.11	1	5.769	100
2008.04.11	1	5.767	100

Result: Gas chromatography indicated one major peak (peak No.1) analyzed on 2007.9.11 and one major peak (peak No.1) analyzed on 2008.4.11.
No new trace impurity peak in the test substance analyzed on 2008.4.11 was detected.

2. Conclusion: The test substance was stable for the period that the test substance had been used for the study.

D. Lot No. : ALQ3659

1. Gas Chromatography

Instrument : Agilent Technologies 5890A Gas Chromatograph

Column : INNOWAX (0.53 mm ϕ \times 60 m)

Column Temperature: 150° C

Flow Rate : 3 mL/min

Detector : FID (Flame Ionization Detector)

Injection Volume : 1 μ L

Date (date analyzed)	Peak No.	Retention Time (min)	Area (%)
2008.04.04	1	5.769	100
2008.08.26	1	5.772	100

Result: Gas chromatography indicated one major peak (peak No.1) analyzed on 2008.4.4 and one major peak (peak No.1) analyzed on 2008.8.26. No new trace impurity peak in the test substance analyzed on 2008.8.26 was detected.

2. Conclusion: The test substance was stable for the period that the test substance had been used for the study.

E. Lot No. : ALL1711

1. Gas Chromatography

Instrument : Agilent Technologies 5890A Gas Chromatograph

Column : INNOWAX (0.53 mm ϕ \times 60 m)

Column Temperature: 150° C

Flow Rate : 3 mL/min

Detector : FID (Flame Ionization Detector)

Injection Volume : 1 μ L

Date (date analyzed)	Peak No.	Retention Time (min)	Area (%)
2008.08.08	1	5.767	100
2008.12.25	1	5.759	100

Result: Gas chromatography indicated one major peak (peak No.1) analyzed on 2008.8.8 and one major peak (peak No.1) analyzed on 2008.12.25.
No new trace impurity peak in the test substance analyzed on 2008.12.25 was detected.

2. Conclusion: The test substance was stable for the period that the test substance had been used for the study.

APPENDIX 2

ENVIRONMENTAL CONDITIONS OF INHALATION CHAMBER IN THE 2-YEAR INHALATION STUDY OF 2,4-PENTANEDIONE

ENVIRONMENTAL CONDITIONS OF INHALATION CHAMBER IN THE 2-YEAR
INHALATION STUDY OF 2,4-PENTANEDIONE

Group Name	Temperature (°C) Mean ± S.D.	Humidity (%) Mean ± S.D.	Ventilation Rate (L/min) Mean ± S.D.	Air Change (time/h) Mean
Control	23.1 ± 0.1	57.2 ± 0.8	1526.4 ± 9.3	12.1
100 ppm	23.1 ± 0.1	56.4 ± 0.8	1529.4 ± 9.7	12.1
200 ppm	23.1 ± 0.1	56.3 ± 0.9	1518.7 ± 10.0	12.0
400 ppm	23.1 ± 0.2	55.8 ± 0.9	1519.9 ± 9.5	12.0

APPENDIX 3

METHODS, UNITS AND DECIMAL PLACE FOR
HEMATOLOGY AND BIOCHEMISTRY IN THE 2-YEAR
INHALATION STUDY OF 2,4-PENTANEDIONE

**METHODS, UNITS AND DECIMAL PLACE FOR HEMATOLOGY AND BIOCHEMISTRY
IN THE 2-YEAR INHALATION STUDY OF 2,4-PENTANEDIONE**

Item	Method	Unit	Decimal place
Hematology			
Red blood cell (RBC)	Light scattering method ¹⁾	$\times 10^9/\mu\text{L}$	2
Hemoglobin(Hgb)	Cyanmethemoglobin method ¹⁾	g/dL	1
Hematocrit(Hct)	Calculated as $\text{RBC} \times \text{MCV}/10$ ¹⁾	%	1
Mean corpuscular volume(MCV)	Light scattering method ¹⁾	fL	1
Mean corpuscular hemoglobin(MCH)	Calculated as $\text{Hgb}/\text{RBC} \times 10$ ¹⁾	pg	1
Mean corpuscular hemoglobin concentration (MCHC)	Calculated as $\text{Hgb}/\text{Hct} \times 100$ ¹⁾	g/dL	1
Platelet	Light scattering method ¹⁾	$\times 10^3/\mu\text{L}$	0
Reticulocyte	Light scattering method ¹⁾	%	1
White blood cell(WBC)	Light scattering method ¹⁾	$\times 10^3/\mu\text{L}$	2
Differential WBC	Light scattering method ¹⁾	%	0
Biochemistry			
Total protein(TP)	Biuret method ²⁾	g/dL	1
Albumin (Alb)	BCG method ²⁾	g/dL	1
A/G ratio	Calculated as $\text{Alb}/(\text{TP} - \text{Alb})$ ²⁾	—	1
T-bilirubin	Azobilirubin method ²⁾	mg/dL	2
Glucose	GlK·G-6-PDH method ²⁾	mg/dL	0
T-cholesterol	CE·COD·POD method ²⁾	mg/dL	0
Triglyceride	MGLP·GK·GPO·POD method ²⁾	mg/dL	0
Phospholipid	PLD·ChOD·POD method ²⁾	mg/dL	0
Aspartate aminotransferase (AST)	JSCC method ²⁾	IU/L	0
Alanine aminotransferase (ALT)	JSCC method ²⁾	IU/L	0
Lactate dehydrogenase (LDH)	JSCC method ²⁾	IU/L	0
Alkaline phosphatase (ALP)	JSCC method ²⁾	IU/L	0
γ -Glutamyl transpeptidase (γ -GTP)	JSCC method ²⁾	IU/L	0
Creatine kinase (CK)	JSCC method ²⁾	IU/L	0
Urea nitrogen	Urease·GLDH method ²⁾	mg/dL	1
Creatinine	Jaffé method ²⁾	mg/dL	1
Sodium	Ion selective electrode method ²⁾	mEq/L	0
Potassium	Ion selective electrode method ²⁾	mEq/L	1
Chloride	Ion selective electrode method ²⁾	mEq/L	0
Calcium	OCPC method ²⁾	mg/dL	1
Inorganic phosphorus	PNP·XOD·POD method ²⁾	mg/dL	1

1) Automatic blood cell analyzer (ADVIA120 : Siemens Healthcare Diagnostics Inc.)

2) Automatic analyzer (Hitachi 7080 : Hitachi,Ltd.)