酸化チタン（ナノ粒子、アナターゼ型）の
ラットを用いた吸入による 2 週間毒性試験報告書

試験番号：0856

APPENDICES

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APPENDIX 1

AEROSOL PARTICLE SIZE DISTRIBUTION ANALYSIS

AEROSOL PARTICLE SIZE DISTRIBUTION ANALYSIS (1)

[0.2 mg/m^3]

Sampling time: 360 min, Flow rate: 10 L/min

Stage No. (Cut-points)	Collection weight (mg)	Collection weight ratio (%)	Cumulative frequency (%)
1 (10.0 μm)	0.001	0.20	100.0
2 (5.6 μm)	0.002	0.40	99.8
3 (3.2 μm)	0.045	9.11	99.4
4 (1.8 μm)	0.127	25.71	90.3
5 (1.0 μm)	0.207	41.90	64.6
6 (0.56 μm)	0.083	16.80	22.7
7 (0.32 μm)	0.020	4.05	5.9
8 (0.18 μm)	0.005	1.01	1.8
9 (0.10 μm)	0.004	0.81	0.8
10 (0.056 μm)	0.000	0.00	0.0
11 (0.032 μm)	0.000	0.00	0.0
12 (0.018 μm)	0.000	0.00	0.0
13 (0.010 μm)	0.000	0.00	0.0
final (～0.010 μm)	0.000	0.00	0.0
Total	0.494	100.00	－

AEROSOL PARTICLE SIZE DISTRIBUTION ANALYSIS (2)

[1 mg/m^3]

Sampling time: 75 min, Flow rate: 10 L/min

Stage No. (Cut-points)	Collection weight (mg)	Collection weight ratio (%)	Cumulative frequency (%)
1 (10.0 μm)	0.002	0.45	100.0
2 (5.6 μm)	0.004	0.90	99.5
3 (3.2 μm)	0.030	6.76	98.6
4 (1.8 μm)	0.116	26.13	91.9
5 (1.0 μm)	0.199	44.82	65.8
6 (0.56 μm)	0.078	17.57	20.9
7 (0.32 μm)	0.009	2.03	3.4
8 (0.18 μm)	0.004	0.90	1.4
9 (0.10 μm)	0.002	0.45	0.5
10 (0.056 μm)	0.000	0.00	0.0
11 (0.032 μm)	0.000	0.00	0.0
12 (0.018 μm)	0.000	0.00	0.0
13 (0.010 μm)	0.000	0.00	0.0
final (～0.010 μm)	0.000	0.00	0.0
Total	0.444	100.00	－

AEROSOL PARTICLE SIZE DISTRIBUTION ANALYSIS (3)

[5 mg/m^3]

Sampling time: 15 min, Flow rate: 10 L/min

Stage No. (Cut-points)	Collection weight (mg)	Collection weight ratio (%)	Cumulative frequency (%)
1 (10.0 μm)	0.001	0.20	100.0
2 (5.6 μm)	0.006	1.20	99.8
3 (3.2 μm)	0.035	7.01	98.6
4 (1.8 μm)	0.136	27.25	91.6
5 (1.0 μm)	0.220	44.09	64.3
6 (0.56 μm)	0.075	15.03	20.2
7 (0.32 μm)	0.017	3.41	5.2
8 (0.18 μm)	0.006	1.20	1.8
9 (0.10 μm)	0.003	0.60	0.6
10 (0.056 μm)	0.000	0.00	0.0
11 (0.032 μm)	0.000	0.00	0.0
12 (0.018 μm)	0.000	0.00	0.0
13 (0.010 μm)	0.000	0.00	0.0
final (～0.010 μm)	0.000	0.00	0.0
Total	0.499	100.00	－

AEROSOL PARTICLE SIZE DISTRIBUTION ANALYSIS (4)

[25 mg/m^3]

Sampling time: 3 min, Flow rate: 10 L/min

Stage No. (Cut-points)	Collection weight (mg)	Collection weight ratio (%)	Cumulative frequency (%)
1 (10.0 μm)	0.005	1.11	100.0
2 (5.6 μm)	0.008	1.77	98.9
3 (3.2 μm)	0.027	5.99	97.1
4 (1.8 μm)	0.111	24.61	91.1
5 (1.0 μm)	0.197	43.68	66.5
6 (0.56 μm)	0.081	17.96	22.8
7 (0.32 μm)	0.015	3.33	4.9
8 (0.18 μm)	0.005	1.11	1.6
9 (0.10 μm)	0.002	0.44	0.4
10 (0.056 μm)	0.000	0.00	0.0
11 (0.032 μm)	0.000	0.00	0.0
12 (0.018 μm)	0.000	0.00	0.0
13 (0.010 μm)	0.000	0.00	0.0
final (～0.010 μm)	0.000	0.00	0.0
Total	0.451	100.00	－

APPENDIX 2

ENVIRONMENTAL CONDITIONS OF INHALATION CHAMBER IN THE 2-WEEK INHALATION STUDY OF TITANIUM DIOXIDE

ENVIRONMENTAL CONDITIONS OF INHALATION CHAMBER
IN THE 2-WEEK INHALATION STUDY OF TITANIUM DIOXIDE

Group Name	Temperature (℃) Mean ± S.D.	Humidity (%) Mean ± S.D.	Ventilation Rate (L/min) Mean ± S.D.	Air Change (time/h) Mean
Control	22.6 ± 0.2	59.5 ± 0.6	204.7 ± 2.5	10.0
0.2 mg/m^3	23.1 ± 0.5	53.7 ± 2.8	207.5 ± 2.7	10.0
1 mg/m^3	22.9 ± 0.4	55.3 ± 2.8	209.6 ± 2.2	10.0
5 mg/m^3	22.8 ± 0.4	53.5 ± 2.5	209.5 ± 1.9	10.0
25 mg/m^3	23.1 ± 0.4	55.0 ± 2.4	208.6 ± 1.3	10.0

APPENDIX 3

METHODS, UNITS AND DECIMAL PLACE FOR HEMATOLOGY AND BIOCHEMISTRY IN THE 2-WEEK INHALATION STUDY OF TITANIUM DIOXIDE

METHODS, UNITS AND DECIMAL PLACE FOR HEMATOLOGY AND BIOCHEMISTRY IN THE 2-WEEK INHALATION STUDY OF TITANIUM DIOXIDE

Item	Method	Unit	Decimal place
Hematology			
Red blood cell (RBC)	Light scattering method [1)]	$\times 10^6/\mu$ L	2
Hemoglobin(Hgb)	Cyanmethemoglobin method [1)]	g/dL	1
Hematocrit(Hct)	Calculated as RBC×MCV/10 [1)]	%	1
Mean corpuscular volume(MCV)	Light scattering method [1)]	fL	1
Mean corpuscular hemoglobin(MCH)	Calculated as Hgb/RBC×10 [1)]	pg	1
Mean corpuscular hemoglobin concentration (MCHC)	Calculated as Hgb/Hct×100 [1)]	g/dL	1
Platelet	Light scattering method [1)]	$\times 10^3/\mu$ L	0
Reticulocyte	Light scattering method [1)]	%	1
White blood cell(WBC)	Light scattering method [1)]	$\times 10^3/\mu$ 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 Alb/(TP－Alb) [2)]	－	1
T-bilirubin	BOD method [2)]	mg/dL	2
Glucose	GlcK･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)]	U/L	0
Alanine aminotransferase (ALT)	JSCC method [2)]	U/L	0
Lactate dehydrogenase (LDH)	JSCC method [2)]	U/L	0
Alkaline phosphatase (ALP)	JSCC method [2)]	U/L	0
γ -Glutamyl transpeptidase (γ -GTP)	JSCC method [2)]	U/L	1
Creatine kinase (CK)	JSCC method [2)]	U/L	0
Urea nitrogen	Urease･GLDH method [2)]	mg/dL	1
Creatinine	Creatinase･SOD･POD method [2)]	mg/dL	2
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.)

APPENDIX 4

METHODS, UNITS AND DECIMAL PLACE FOR CYTOLOGY AND BIOCHEMISTRY OF BALF

METHODS, UNITS AND DECIMAL PLACE FOR CYTOLOGY AND BIOCHEMISTRY OF BALF

Item	Method	Unit	Decimal place
Cytology			
Total cell count	Light scattering method [1)]	$\times 10^3/\mu L$	2
Differential	Visual observation method (May-Grunwald-Giemsa stain)	%	1
Biochemistry			
Total protein(TP)	Pyrogallol red method [2)]	μ g/mL	0
Albumin (Alb)	Immuno-nephelometry [2)]	μ g/ mL	0
LDH	JSCC method [2)]	U/L	0
ALP	JSCC method [2)]	U/L	0
γ -GTP	JSCC method [2)]	U/L	1

1) Automatic blood cell analyzer (ADVIA120 : Siemens Healthcare Diagnostics Inc.)
2) Automatic analyzer (Hitachi 7080 : Hitachi,Ltd.)