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RESULTS SUMMARY

Company Name : Trumer Medicare Sdn Bhd
(Attn.: Mr. K.C. Yap)
Address : No 16-2 Jalan SS19/1G,
47500 Subang Jaya,
Selangor
Request : Mutagenicity Study

Your Ref No.	
SIRIM Ref. No.	ETRC 257/16/1127
Job No.	J076/2013
Report No.	R 113/2013
Date of Issue	30 July 2013
No. of pages	1

SAMPLE DESCRIPTION:

One (1) liquid samples were received on 18 June 2013 and coded as Nano Colloidal Argentum:

TEST METHOD:

OECD Guidelines for Testing of Chemicals Method 471(Adopted 21st July 1997), Bacterial Reverse Mutation Test.

RESULT:

Nano Colloidal Argentum was judged to have no reverse mutagenic potential with and without metabolic activation system under the present test conditions.

Refer to ETRC257/16/1127(R113/2013) for details.

INFERENCE:

The Nano Colloidal Argentum was determined as non-mutagenic and classified as "Not classified" according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Fourth Revised Edition as shown below:

Ingredient Classification	Cut-off/concentration limit		
	Category 1 mutagen		Category 2 mutagen
	Category 1A	Category 1B	
Category 1A mutagen	≥0.1%	-	-
Category 1B mutagen	-	≥0.1%	-
Category 2 mutagen	-	-	≥0.1%

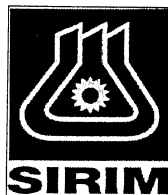
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TEST REPORT

BACTERIAL REVERSE MUTATION TEST OF NANO COLLOIDAL ARGENTUM

Prepared for:

Trumer Medicare Sdn. Bhd.
No. 16-2, Jalan SS19/1G,
47500 Subang Jaya
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Prepared by:

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Jul 30, 2013

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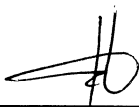


Statement of ISO/IEC 17025 STR 1.2 Compliance

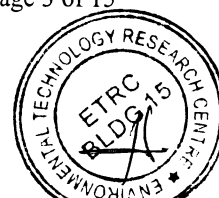
I, the undersigned, hereby declare that this report constitutes a true and complete representation of the procedures followed and of the result obtained in this study by ETRC, SIRIM Berhad, and that the study was carried out under my supervision.

The study was conducted according to the ISO/IEC 17025 STR 1.2 requirements.

Hasnah Mohd Zin
Study Director
Environmental Technology Research Centre
SIRIM Berhad

 30/7/2013

Signature and Date





Study Information

Study Title

Bacterial Reverse Mutation Test of Nano Colloidal Argentum

Study Director

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Study personnel

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Study period

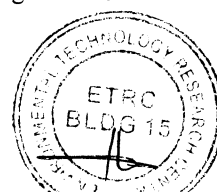
- i. Experimental start date: 10 July 2013
- ii. Experimental completion date: 22 July 2013
- iii. Study completion date: 30 July 2013

Sponsor

Trumer Medicare Sdn. Bhd.
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Testing Facility

Mutagenicity Laboratory
Environmental Technology Research Centre
Building 15, SIRIM Berhad
No. 1, Persiaran Dato' Menteri, Seksyen 2
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Report Information

Study Title

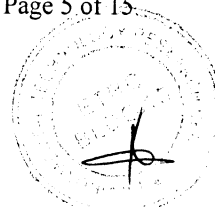
Bacterial Reverse Mutation Test of Nano Colloidal Argentum

This report was prepared by

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Summary

The bacteria reverse mutation test of Nano Colloidal Argentum was performed on *Salmonella typhimurium* strains TA100, TA1535, TA98, TA1537 and *Escherichia coli* strain WP2uvrA using the pre-incubation method in the presence and absence of an exogenous metabolic activation system.

The results showed the number of revertant colonies for all strains which were treated with the test item were less than twice that of the negative controls with and without S9 Mix.

The number of revertant colonies in the negative control and positive controls were within the background data of ETRC laboratory.

Based on the above results, Nano Colloidal Argentum was judged to have no reverse mutagenic potential with and without metabolic activation system under the present test conditions.

1 Introduction

The sample is coded as Nano Colloidal Argentum, a product produced by Trumer Medicare Sdn. Bhd.

The purpose of this study was to determine the mutagenic potential of Nano Colloidal Argentum using *Salmonella typhimurium* and *Escherichia coli* strains. This study was conducted in accordance with Method 471, Bacterial Reverse Mutation Test (Adopted 21st July 1997), OECD GUIDELINE for Testing of Chemicals.

2 Materials and Methods

2.1 Test Item

(Information as provided by the sponsor)

Name:	Nano Colloidal Argentum
Other name:	Not applicable
CAS No.:	Not applicable
Sponsor:	Trumer Medicare Sdn. Bhd.
Lot/Batch No.:	Not available
Manufactured date:	Not available
Date of receipt:	18 th June 2013
Expiry date:	Not available
Structural formula or rational formula:	Not available
Purity:	Not available
Contents of Impurities:	Not available
Physicochemical properties as follows:	
Appearance at ordinary temperature:	Clear liquid
Molecular weight:	Not available
Stability:	*No denaturation observed
Melting Point:	Not available
Boiling Point:	Not available
Vapor Pressure:	Not available
Partition Coefficient:	Not available
Solubility:	No information
Degree of Solubility:	
Water:	* Soluble at 50 mg/ml
DMSO:	* Soluble at 50 mg/ml
Acetone:	* Soluble at 100 mg/ml
Storage condition:	Store in Cold Room 4°C
Stability of test concentrations:	*No denaturation observed
Handling care:	Wear mask, glove and lab coat

Note *: test was conducted as in-house method.

2.2 Reference Items

(Information as provided by the chemical suppliers)

2.2.1 Dimethyl sulfoxide (DMSO)

Manufacturer: R&M Chemicals
Lot No.: POHE130612
Properties: Colourless liquid
Purity: >99.9%
Grade: Analytical grade

2.2.2 Furfurylamide (AF-2)

Manufacturer: Wako Pure Chemical Industries, Ltd.
Lot No.: STQ3987
Properties: Green crystalline powder
Purity: 99.7%
Grade: Analytical grade

2.2.3 Sodium azide (NaN_3)

Manufacturer: Sigma-Aldrich
Lot No.: 109K0088
Properties: White crystalline powder
Purity: 99.7%
Grade: Analytical grade

2.2.4 Acridine Mutagen (ICR-191)

Manufacturer: Sigma
Lot No.: 031M1947V
Properties: Yellow powder with orange cast
Purity: Not available
Grade: Analytical grade

2.2.5 2-Nitrofluorene (2-NF)

Manufacturer: Aldrich
Lot No.: S43858
Properties: Yellow-tan powder
Purity: 97.9%
Grade: Analytical grade

2.2.6 2-Aminoanthracene (2AA)

Manufacturer: Aldrich
Lot No.: STBB1901
Properties: Olive green powder
Purity: 97.5%
Grade: Analytical grade

2.2.7 Storage Conditions

2-NF, AF-2, NaN_3 and 2AA were stored at room temperature and ICR-191 was stored in a refrigerator at 4°C.

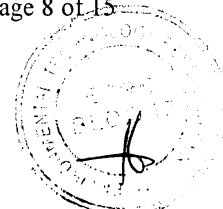
2.2.8 Care on Handling

Gloves and lab coat were worn when handling the positive controls.

2.3 Test System

2.3.1 Source

The *Salmonella typhimurium* strains TA100, TA98, TA1535 and TA1537 and *E. coli* strain WP2uvrA were obtained from National Collection of Type Cultures (NCTC)



United Kingdom and National Collection of Industrial, Food and Marine Bacteria (NCIMB) United Kingdom, respectively, on 19th August 2010.

2.3.2 Characterization of the test organism

All *Salmonella* strains were histidine, and the *E. coli* strain was tryptophan dependent. The revertants were identified as colonies that grow in low levels of histidine or tryptophan. Additional genetic markers serve to make the strains more sensitive to certain types of mutagens. A list of these additional genetic markers and strain characteristics were shown in Table 1.

Table 1: Characteristics of *Salmonella* and *E. coli* Strains Used for the Ames Test

Bacterial Strain	Gene Affected	DNA-repaired	LPS	Biotin Requirement	Plasmids	Mutational Event
<i>S. typh.</i> TA98	hisD	uvrB	rfa	Bio (-ve)	PKM101	Frameshift
<i>S. typh.</i> TA100	hisG	uvrB	rfa	Bio (-ve)	PKM101	Base-pair substitution
<i>S. typh.</i> TA1535	hisG	uvrB	rfa	Bio (-ve)	-	Base-pair substitution
<i>S. typh.</i> TA1537	hisC	uvrB	rfa	Bio (-ve)	-	Frameshift
<i>E. coli</i> WP2uvrA	trp	uvrA	-	-	-	Base-pair substitution

The DNA repair mutation (*uvrA/B*) eliminates excision repair, a repair pathway for DNA damage from UV light and certain mutagens. The presence of the *uvrA/B* mutation makes the strains more sensitive to the test articles that induce damage in this manner. The *uvrA/B* mutation is part of a deletion mutation extending into a gene for biotin synthesis; therefore, the biotin requirement is a result of the deletion of this region. The *uvrA/B* mutation is indicated by sensitivity to UV light.

The *rfa* mutation changes the properties of the bacterial cell wall and results in the partial loss of the lipopolysaccharide (LPS) barrier increasing permeability of cells to certain types of chemicals. The *rfa* mutation is indicated by sensitivity to crystal violet. The R factor plasmid (pKM101) makes the strains more responsive to a variety of mutagens. The plasmid carries an ampicillin resistance gene; therefore ampicillin resistance indicates that the strains retain the plasmid.

The characterization of *Salmonella typhimurium* strains TA98, TA100, TA1535 and TA1537 and *E. coli* strain WP2uvrA were conducted on 24th July, 2012.

2.3.3 Storage

The tester strains were stored as frozen working stock cultures (0.0875 ml of Dimethyl sulfoxide (DMSO)/ml of broth culture) at -80°C in Ultra-deep Freezer.

2.4 Test Condition

2.4.1 Minimal agar plate

Minimal agar plates (Batch No. D13MINIMAL002) were purchased from ISOLAB Sdn. Bhd. with the expiry date on 15th October 2013. The plates were stored at 2°C to 8°C until use.

2.4.2 Overlay agar

The overlay agar was composed of 0.6 % (w/v) agar (Bacto-Agar, Lot No. 348882) and 0.5% (w/v) NaCl. One bottle of 100 ml overlay agar was added with 10 ml a mixture of 0.5 mM histidine and 0.5 mM biotin for *S. typhimurium* strains. Another bottle of 100 ml overlay agar was added with 10 ml 0.5 mM tryptophan for *E. coli* strain. Both have a ratio of 1:10 of amino acid to agar.

2.4.3 Metabolic Activation System (S9 Mix)

A volume of 6 ml rat liver S9 with cofactor and buffer was added into tube contained of 1.2 ml salt solution (1.65M KCl + 0.4M MgCl₂), 0.3 ml 1M glucose-6-phosphate, 2.4 ml 0.1M nicotine adenine dinucleotide phosphate (NADP), 30 ml 0.2M phosphate buffer at pH7.4 and 20.1 ml sterile pure water.

The final concentration of S9 mix was 10% and it was prepared freshly before used. The S9 (Lot No. 2837) was purchased from Molecular Toxicology Inc. (Moltox) with the expiry date on 30th September 2013 and was stored at -80°C Ultra-deep Freezer.

2.4.4 Test Item

Prior to the sample preparation the test item was tested for solubility on water, DMSO and acetone. The results show the water is the appropriate as the test item was much homogenized compared to the rest.

The test item was weighed (0.4g) and suspended in water (8ml) with the final concentration 50 mg/ml. In the test, the highest concentration prepared was 5000 µg/plate and continue with 4 other concentrations in geometric series of a factor 2. The test item was in the form of solution and the test item solution was mixed with vortex during transferring into test tube.

The stability of test item solution for denaturation activity with respect to the changes of colour and/or exothermic reaction was observed throughout the experimental time. The test item solution was kept at room temperature within the experimental time.

2.4.5 Reference Items

Sodium azide (NaN₃) was dissolved in pure water. Furfuryluramide (AF-2), Acridine mutagen (ICR-191), 2-Nitrofluorene (2-NF) and 2-Aminoanthracene (2AA) were dissolved in DMSO. The concentration of positive controls (PC) used as reference items for each of bacterial tester strain were shown in Table 2.

Table 2: Positive controls used for each of bacterial strain

Bacterial Tester Strain		TA100	TA1535	WP2 $uvrA$	TA98	TA1537
Without S9 Mix	PC	NaN ₃	NaN ₃	AF-2	2-NF	ICR-191
	Conc. ($\mu\text{g}/\text{plate}$)	0.5	0.5	0.05	1	1
With S9 Mix	PC	2AA	2AA	2AA	2AA	2AA
	Conc. ($\mu\text{g}/\text{plate}$)	1	2	10	0.5	2

The working stocks of positive control were stored at -80°C Ultra-deep Freezer.

2.4.6 Bacteria culture

Each of tested bacteria strain culture was prepared by inoculation of 36 μl of bacterial suspension from working stock into a L-tube containing 18 ml nutrient broth No. 2 for *S. typhimurium* (TA1535 and TA1537) and *E. coli* (WP2 $uvrA$) and Nutrient broth No. 2 with Ampicillin for *S. typhimurium* (TA98 and TA100). These cultures were incubated at $37 \pm 0.5^\circ\text{C}$ for 6 - 9 h with shaking at 57 times/min in a shaker water-bath.

The optical density reading was determined at 660 nm by spectrophotometer until it reaches the target value at the end of incubation. The optical density values were used to calculate the viable cell against the set value equivalent to 1×10^9 . The set values were obtained from growth profile study prepared for each new lot of bacterial strains. The viable cell counts for each of bacterial strain were shown in Table 3.

Table 3: Viable cell counts of each strain

Bacterial Tester Strain		TA100	TA1535	WP2 $uvrA$	TA98	TA1537
No. of viable cells ($\times 10^9/\text{ml}$)	Dose finding test	1.02	1.00	1.07	1.00	1.00
	Main test	1.01	1.01	1.03	1.02	1.02

2.4.7 Treatment procedures of pre-incubation method

Test item

One set of 15 test tubes containing of test item (0.1 ml) was added with 0.5 ml of S9 Mix. Another set of test tubes containing test item (0.1 ml) was added with 0.5 ml of 0.1 M sodium phosphate buffer (pH 7.4). Lastly, both sets were added with 0.1 ml fresh bacteria culture.

Negative control

One set of test tubes containing of negative control (0.1 ml) was added with 0.5 ml of S9 Mix. Another set was added with 0.5 ml of 0.1 M sodium phosphate buffer (pH 7.4). Lastly, both sets were added with 0.1 ml fresh bacteria culture.

Positive control

One set of test tubes containing of positive control (0.1 ml) was added with 0.5 ml of S9 Mix. Another set was added with 0.5 ml of 0.1 M sodium phosphate buffer (pH 7.4). Lastly, both sets were added with 0.1 ml fresh bacteria culture.

The mixtures were incubated for 20 minutes at $35 \pm 2^{\circ}\text{C}$ and aerated during incubation using shaker. Two ml of soft agar was added into each tube followed by vortexed and poured onto the surface of a minimal agar plates, swirled to form an even layer and allowed to solidify.

The plates were incubated for 48 hours at $37 \pm 2^{\circ}\text{C}$. The number of revertant colonies were observed and counted.

Triplicate plates were used for the negative control, positive control and test item at each concentration in the presence and absence of metabolic activation system for an adequate estimated of variation.

The contaminant checks were conducted for test item solution, S9 Mix and 0.1 M sodium phosphate buffer. The volume of 0.1 ml of each were poured onto a minimal agar plate and incubated at $37 \pm 2^{\circ}\text{C}$ for 48 hours. The bacterial contamination was observed by the growth of bacterial colony.

2.4.8 Concentration selection

The concentration was selected based on the highest dose at 5000 $\mu\text{g}/\text{plate}$ and followed with 2500, 1250, 625 and 313 $\mu\text{g}/\text{plate}$.

2.4.9 Observation and measurement

The form of the revertant colonies, test item precipitation and growth inhibition was examined under a stereo microscope, growth inhibition was classified based on shape of bacterial lawn and described as follows: T1 for slightly rough or changed, T2 for rough, T3 for very rough, and T4 for no revertant and no bacterial lawn observed.

The number of revertant colonies was counted manually. The average number of colonies for each test item concentration, negative control and positive control were calculated as the average plate counts for a set of triplicates. Decimals of the average figures were rounded off.

2.5 Statistical Method

Experimental raw data was statistically treated for average and standard deviation using Excel spreadsheet.

2.6 Unexpected Situations and Deviations

There was no unexpected situation which might have affected the test results and deviation from study plan.

3 Result and Discussion

There was no sign of toxicity effect at the concentration of 5000 $\mu\text{g}/\text{plate}$. Test item concentration from 313 to 5000 $\mu\text{g}/\text{plate}$ was shown no precipitation of test item on the surface of agar.

The results for dose finding test without and with S9 mix were shown in Table A1.1 and A1.2 (Appendix A1). Whereas the results for main test without and with S9 mix were shown in Table A2.1 and A2.2 (Appendix A2).

The numbers of revertant colonies for all tested strains TA98, TA100, TA1535, TA1537 and WP2uvrA, treated with and without S9 Mix at all concentrations were less than 2-fold of negative control.

The results show no evidence of increasing in the revertant colonies from the 313 and 5000 µg/plate concentration for all bacterial strains treated with and without S9 Mix in both tests (DFT and MT).

The positive controls showed the number of revertant colonies more than 2-fold of negative control. The positive controls with and without metabolic activation system (S9 mix) for TA98 TA100, TA1535, TA1537 and WP2uvrA were within the background data in the range of ± 2 SD.

The absence of any microorganisms in the contaminant check shows the test study was free from any contamination.

4 Conclusion

Nano Colloidal Argentum was judged to have no reverse mutagenic potential with and without metabolic activation system under the present test conditions.

5 Storage and Retention of Records/Materials

All study-specific records are kept in ETRC (address as indicated on the front page of this report) for a period of 6 years from the date of study completion.

All records can be claimed by the sponsor with official notification before the expiry date of the storage and retention time, or upon termination of test facility's storage and retention provision.

6 References

- i Method 471 Bacteria Reverse Mutation Test (Adopted 21st July 1997), OECD Guideline for Testing of Chemicals.
- ii Green M.H.L. and W.J. Muriel (1976) Mutagen testing using Trp + reversion in *Escherichia coli*, Mutation Res., 38: 3-31.
- iii Maron, D.M. and B.N. Ames (1983) Revised methods for the Salmonella Mutagenicity test, Mutation Res., 113: 173-215.

Appendix A1

Table A1.1: Result of Dose Finding Test Without S9 Mix for Nano Colloidal Argentum

Test item concentration (µg/plate)	Number of revertants [(number of colonies/plate) ± SD]				
	Base-pair substitution type			Frameshift type	
	TA100	TA1535	WP2 <i>uvrA</i>	TA98	TA1537
Control (Water) Concurrent	214 ± 10	16 ± 2	30 ± 5	42 ± 5	9 ± 2
Control (Water) (* ⁵ Historical)	162 ± 40	19 ± 10	25 ± 7	33 ± 10	12 ± 5
313	195 ± 19	17 ± 2	34 ± 10	43 ± 5	13 ± 3
625	187 ± 2	18 ± 2	41 ± 4	45 ± 4	10 ± 2
1250	183 ± 13	17 ± 1	37 ± 2	41 ± 3	10 ± 3
2500	192 ± 6	13 ± 2	34 ± 3	42 ± 7	13 ± 4
5000	209 ± 19	14 ± 2	36 ± 5	39 ± 3	12 ± 1
Positive control	* ¹ NaN ₃	* ¹ NaN ₃	* ² AF-2	* ³ 2-NF	* ⁴ ICR-191
Concentration (µg/plate)	0.5	0.5	0.05	1	1
Number of revertant (Concurrent)	856 ± 44	657 ± 27	1850 ± 118	877 ± 70	340 ± 37
Number of revertant (* ⁵ Historical)	1137 ± 330	550 ± 183	1182 ± 465	518 ± 192	634 ± 220

Note: *¹NaN₃: Sodium azide
*²AF-2: 2-Furylfuramide
*³2-NF: 2-Nitrofluorene
*⁴ICR-191: Acridine mutagen
*⁵Historical: Accumulative historical data from Year 2000 to this current study

Table A1.2: Result of Dose Finding Test With S9 Mix for Nano Colloidal Argentum

Test item concentration (µg/plate)	Number of revertants [(number of colonies/plate) ± SD]				
	Base-pair substitution type			Frameshift type	
	TA100	TA1535	WP2 <i>uvrA</i>	TA98	TA1537
Control (Water) Concurrent	208 ± 4	21 ± 5	25 ± 1	38 ± 3	10 ± 3
Control (Water) (* ² Historical)	160 ± 45	19 ± 8	26 ± 7	40 ± 12	14 ± 6
313	213 ± 4	20 ± 4	32 ± 8	37 ± 1	13 ± 3
625	207 ± 9	21 ± 3	39 ± 2	40 ± 8	17 ± 2
1250	208 ± 13	23 ± 7	39 ± 5	29 ± 3	14 ± 3
2500	187 ± 6	20 ± 6	35 ± 8	43 ± 8	8 ± 1
5000	205 ± 7	17 ± 4	28 ± 5	37 ± 3	13 ± 2
Positive control	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA
Concentration (µg/plate)	1	2	10	0.5	2
Number of revertant (Concurrent)	469 ± 12	228 ± 7	233 ± 12	332 ± 10	165 ± 17
Number of revertant (* ² Historical)	522 ± 159	159 ± 82	128 ± 38	193 ± 67	137 ± 60

Note: *¹2AA: 2-Aminoanthracene
*²Historical: Accumulative historical data from Year 2000 to this current study

Appendix A2

Table A2.1: Result of Main Test Without S9 Mix for Nano Colloidal Argentum

Test item concentration ($\mu\text{g}/\text{plate}$)	Number of revertants [(number of colonies/plate) \pm SD]				
	Base-pair substitution type			Frameshift type	
	TA100	TA1535	WP2 <i>uvrA</i>	TA98	TA1537
Control (Water) Concurrent	142 \pm 17	15 \pm 5	38 \pm 2	41 \pm 6	10 \pm 3
Control (Water) (* ⁵ Historical)	162 \pm 40	19 \pm 10	25 \pm 7	33 \pm 10	12 \pm 5
313	151 \pm 14	18 \pm 1	34 \pm 8	32 \pm 1	13 \pm 3
625	154 \pm 14	15 \pm 7	35 \pm 4	37 \pm 6	18 \pm 3
1250	157 \pm 17	15 \pm 2	35 \pm 5	36 \pm 2	11 \pm 2
2500	166 \pm 10	14 \pm 7	33 \pm 1	31 \pm 5	14 \pm 5
5000	150 \pm 10	20 \pm 9	36 \pm 3	31 \pm 1	13 \pm 4
Positive control	* ¹ NaN ₃	* ¹ NaN ₃	* ² AF-2	* ³ 2-NF	* ⁴ ICR-191
Concentration ($\mu\text{g}/\text{plate}$)	0.5	0.5	0.05	1	1
Number of revertant (Concurrent)	623 \pm 24	636 \pm 51	1135 \pm 37	865 \pm 252	396 \pm 79
Number of revertant (* ⁵ Historical)	1137 \pm 330	550 \pm 183	1182 \pm 465	518 \pm 192	634 \pm 220

Note: *¹NaN₃: Sodium azide
*²AF-2: 2-Furylfuramide
*³2-NF: 2-Nitrofluorene
*⁴ICR-191: Acridine mutagen
*⁵Historical: Accumulative historical data from Year 2000 to this current study

Table A2.2: Result of Main Test With S9 Mix for Nano Colloidal Argentum

Test item concentration ($\mu\text{g}/\text{plate}$)	Number of revertants [(number of colonies/plate) \pm SD]				
	Base-pair substitution type			Frameshift type	
	TA100	TA1535	WP2 <i>uvrA</i>	TA98	TA1537
Control (Water) Concurrent	152 \pm 17	19 \pm 0	33 \pm 3	49 \pm 3	14 \pm 3
Control (Water) (* ² Historical)	160 \pm 45	19 \pm 8	26 \pm 7	40 \pm 12	14 \pm 6
313	171 \pm 21	19 \pm 7	39 \pm 12	45 \pm 6	14 \pm 2
625	166 \pm 17	22 \pm 4	37 \pm 10	53 \pm 4	15 \pm 2
1250	164 \pm 7	20 \pm 3	39 \pm 5	39 \pm 6	19 \pm 3
2500	150 \pm 5	15 \pm 0	32 \pm 2	41 \pm 3	15 \pm 4
5000	149 \pm 10	22 \pm 2	31 \pm 4	42 \pm 4	20 \pm 3
Positive control	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA	* ¹ 2AA
Concentration ($\mu\text{g}/\text{plate}$)	1	2	10	0.5	2
Number of revertant (Concurrent)	447 \pm 14	350 \pm 40	243 \pm 13	394 \pm 1	107 \pm 9
Number of revertant (* ² Historical)	522 \pm 159	159 \pm 82	128 \pm 38	193 \pm 67	137 \pm 60

Note: *¹2AA: 2-Aminoanthracene
*²Historical: Accumulative historical data from Year 2000 to this current study