

Study Number: C03038-01

Test Type: TOX

Route: Dosing in Water

Species/Strain: Rat/Harlan Sprague Dawley

C Number:

Study Gender:

PWG Approval Date

PA44: Urinalysis Data Summary

Test Compound: Sodium Tungstate Dihydrate

CAS Number: 10213-10-2

C03038-01

Both

See web page for date of PWG Approval

Date Report Requested: 09/26/2019

Time Report Requested: 07:01:30

Lab: NTP

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Lab: NTP

F1 Male

	Phase Day	Treatment Groups			
		0 mg/L	125 mg/L	250 mg/L	500 mg/L
Urine Clarity	SD 78	(10)	(10)	(10)	(10)
Clear	SD 78	10	10	10	10
Urine Color	SD 78	(10)	(10)	(10)	(10)
Straw	SD 78			1	
Yellow	SD 78	10	10	9	10
Urine Volume (ml)	SD 78	14.3 ± 2.0 (5)	17.9 ± 4.6 (5)	16.5 ± 4.7 (5)	8.2 ± 2.6 (5)
Specific Gravity	SD 78	1.017 ± 0.002 (5)	1.018 ± 0.005 (5)	1.018 ± 0.003 (5)	1.033 ± 0.010 (5)
SEDIMENT EXAM					
Urine White Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Urine Red Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.3 ± 0.3 (5)
Casts	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Epithelial Cells	SD 78	1.2 ± 0.1 (5)	1.2 ± 0.2 (5)	1.0 ± 0.2 (5)	1.1 ± 0.1 (5)
Mucus	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Sperm	SD 78	2.3 ± 0.3 (5)	1.7 ± 0.1 (5)	2.0 ± 0.5 (5)	1.6 ± 0.4 (5)
Bacteria	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Yeast	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Amorphous Sediment	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Crystals	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
URINE CHEMISTRIES					
Creatinine (mg/dL)	SD 78	77.9 ± 10.2 (5)	80.5 ± 22.6 (5)	76.2 ± 11.3 (5)	154.5 ± 44.5 (5)
Percent of Control			103.3	97.8	198.3
Total Protein (mg/dL)	SD 78	84.7 ± 13.5 (5)	71.0 ± 15.2 (5)	141.7 ± 57.5 (5)	153.5 ± 47.7 (5)
Percent of Control			83.8	167.3	181.2
Total Protein/Creatinine	SD 78	1.1 ± 0.2 (5)	1.0 ± 0.1 (5)	1.7 ± 0.5 (5)	1.0 ± 0.1 (5)
Percent of Control			87.9	152.4	89.8
Glucose (mg/dL)	SD 78	8.7 ± 1.2 (5)	8.5 ± 2.4 (5)	8.6 ± 1.3 (5)	17.5 ± 5.3 (5)
Percent of Control			97.7	98.9	201.1
Glucose/Creatinine	SD 78	0.11 ± 0.01 (5) *	0.10 ± 0.00 (5)	0.11 ± 0.00 (5)	0.11 ± 0.00 (5)
Percent of Control			92.9	102.7	100.2

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PA44: Urinalysis Data Summary

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Lab: NTP

F1 Male

	Phase Day	Treatment Groups			
		0 mg/L	125 mg/L	250 mg/L	500 mg/L
Calcium (mg/dL)	SD 78	3.8 ± 0.8 (5)	8.8 ± 3.8 (5)	8.0 ± 1.8 (5)	8.2 ± 3.0 (5)
Percent of Control			232.8	212.2	217.5
Calcium/Creatinine	SD 78	0.05 ± 0.01 (5)	0.12 ± 0.04 (5)	0.11 ± 0.02 (5)	0.05 ± 0.01 (5)
Percent of Control			224.5	194.3	91.9
Phosphorus (mg/dL)	SD 78	71.2 ± 10.6 (5)	46.0 ± 18.6 (5)	38.1 ± 6.3 (5)	125.9 ± 31.7 (5)
Percent of Control			64.6	53.4	176.8
Phosphorus/Creatinine	SD 78	0.92 ± 0.09 (5)	0.55 ± 0.07 (5) *	0.49 ± 0.05 (5) *	0.88 ± 0.13 (5)
Percent of Control			59.5	53.7	95.3
N-acetyl-beta-glucosaminidase (U/L)	SD 78	13.3 ± 2.9 (5) *	11.0 ± 1.9 (5)	11.2 ± 1.6 (5)	18.0 ± 4.0 (5)
Percent of Control			82.7	84.3	135.2
N-acetyl-beta-glucosaminidase/Creatinine (U/mg)	SD 78	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)	0.01 ± 0.00 (5)
Percent of Control			97.9	94.5	80.3
Alkaline Phosphatase (U/L)	SD 78	145.7 ± 12.7 (5)	125.4 ± 34.4 (5)	125.7 ± 35.7 (5)	206.1 ± 53.8 (5)
Percent of Control			86.1	86.3	141.5
Alkaline Phosphatase/Creatinine (U/mg)	SD 78	0.20 ± 0.02 (5)	0.16 ± 0.02 (5)	0.15 ± 0.03 (5)	0.14 ± 0.01 (5)
Percent of Control			83.6	76.6	73.3
Aspartate Aminotransferase (U/L)	SD 78	5.1 ± 0.7 (5)	BD	5.3 ± 1.7 (5)	6.8 ± 2.3 (5)
Percent of Control				102.9	133.3
Aspartate Aminotransferase/Creatinine (U/mg)	SD 78	0.01 ± 0.00 (5)	BD	0.01 ± 0.00 (5)	0.00 ± 0.00 (5)
Percent of Control				105.4	62.8
Methionine Concentration in Urine (ug/mL)	SD 78	1.83 ± 0.14 (5)	1.62 ± 0.45 (5)	1.67 ± 0.40 (5)	3.09 ± 0.94 (5)
Percent of Control			88.5	91.6	169.4
Methionine Concentration/Creatinine (ug/mg)	SD 78	2.39 ± 0.17 (5)	1.99 ± 0.05 (5)	2.16 ± 0.32 (5)	2.08 ± 0.16 (5)
Percent of Control			83.3	90.6	87.3
Xanthine Concentration in Urine (ug/mL)	SD 78	1.20 ± 0.16 (5) **	1.51 ± 0.44 (5)	1.58 ± 0.24 (5)	4.48 ± 1.75 (5)
Percent of Control			126.5	132.2	374.2
Xanthine Concentration/Creatinine (ug/mg)	SD 78	1.55 ± 0.09 (5) **	1.83 ± 0.04 (5) *	2.13 ± 0.08 (5) *	2.79 ± 0.37 (5) *
Percent of Control			118.2	137.8	180.5
Tungsten Concentration in Urine (ug/g)	SD 78	0.041 ± 0.004 (5) **	9.777 ± 3.023 (5) **	24.214 ± 5.083 (5) **	67.109 ± 22.657 (5) **
Tungsten Concentration/Creatinine (ug/mg)	SD 78	0.056 ± 0.009 (5) **	11.841 ± 1.427 (5) **	33.684 ± 4.972 (5) **	42.401 ± 4.640 (5) **

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Lab: NTP

F1 Male

Treatment Groups

	Phase Day	1000 mg/L	2000 mg/L
Urine Clarity	SD 78	(10)	(9)
Clear	SD 78	10	9
Urine Color	SD 78	(10)	(9)
Straw	SD 78		
Yellow	SD 78	10	9
Urine Volume (ml)	SD 78	13.7 ± 2.5 (5)	11.1 ± 1.9 (4)
Specific Gravity	SD 78	1.017 ± 0.003 (5)	1.021 ± 0.004 (4)
SEDIMENT EXAM			
Urine White Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Urine Red Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Casts	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Epithelial Cells	SD 78	1.1 ± 0.2 (5)	1.3 ± 0.1 (4)
Mucus	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Sperm	SD 78	1.6 ± 0.3 (5)	0.9 ± 0.2 (4)
Bacteria	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Yeast	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Amorphous Sediment	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Crystals	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
URINE CHEMISTRIES			
Creatinine (mg/dL)	SD 78	73.9 ± 15.1 (5)	73.5 ± 11.8 (4)
Percent of Control		94.9	94.4
Total Protein (mg/dL)	SD 78	62.3 ± 16.6 (5)	83.1 ± 15.8 (4)
Percent of Control		73.6	98.1
Total Protein/Creatinine	SD 78	0.8 ± 0.1 (5)	1.1 ± 0.0 (4)
Percent of Control		76.6	95.5
Glucose (mg/dL)	SD 78	8.2 ± 2.0 (5)	9.7 ± 1.4 (4)
Percent of Control		94.3	111.6
Glucose/Creatinine	SD 78	0.11 ± 0.00 (5)	0.13 ± 0.01 (4)
Percent of Control		97.8	120.7

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Lab: NTP

F1 Male

Treatment Groups

	Phase Day	1000 mg/L	2000 mg/L
Calcium (mg/dL)	SD 78	2.8 ± 0.5 (5)	5.5 ± 1.9 (4)
Percent of Control		74.3	145.8
Calcium/Creatinine	SD 78	0.04 ± 0.01 (5)	0.08 ± 0.03 (4)
Percent of Control		79.3	148.0
Phosphorus (mg/dL)	SD 78	65.0 ± 13.1 (5)	58.4 ± 12.9 (4)
Percent of Control		91.3	82.0
Phosphorus/Creatinine	SD 78	0.88 ± 0.06 (5)	0.77 ± 0.03 (4)
Percent of Control		95.6	83.6
N-acetyl-beta-glucosaminidase (U/L)	SD 78	14.5 ± 2.2 (5)	18.2 ± 1.0 (4)
Percent of Control		108.8	136.8
N-acetyl-beta-glucosaminidase/Creatinine (U/mg)	SD 78	0.02 ± 0.00 (5)	0.03 ± 0.00 (4)
Percent of Control		128.7	170.2
Alkaline Phosphatase (U/L)	SD 78	127.0 ± 28.5 (5)	127.2 ± 16.3 (4)
Percent of Control		87.2	87.3
Alkaline Phosphatase/Creatinine (U/mg)	SD 78	0.17 ± 0.01 (5)	0.18 ± 0.01 (4)
Percent of Control		88.8	89.0
Aspartate Aminotransferase (U/L)	SD 78	5.5 ± 1.5 (5)	9.0 ± 0.8 (4)
Percent of Control		107.8	177.3
Aspartate Aminotransferase/Creatinine (U/mg)	SD 78	0.01 ± 0.00 (5)	0.01 ± 0.00 (4)
Percent of Control		105.0	204.3
Methionine Concentration in Urine (ug/mL)	SD 78	1.35 ± 0.32 (5)	1.81 ± 0.31 (4)
Percent of Control		73.7	99.2
Methionine Concentration/Creatinine (ug/mg)	SD 78	1.83 ± 0.14 (5)	2.51 ± 0.12 (4)
Percent of Control		76.7	105.3
Xanthine Concentration in Urine (ug/mL)	SD 78	3.20 ± 0.52 (5) *	5.45 ± 0.88 (4) *
Percent of Control		267.3	455.0
Xanthine Concentration/Creatinine (ug/mg)	SD 78	4.63 ± 0.27 (5) *	7.65 ± 0.26 (4) *
Percent of Control		299.3	495.0
Tungsten Concentration in Urine (ug/g)	SD 78	61.908 ± 11.788 (5) **	184.976 ± 30.136 (4) **
Tungsten Concentration/Creatinine (ug/mg)	SD 78	86.680 ± 5.670 (5) **	291.515 ± 25.653 (4) **

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Lab: NTP

F1 Female

	Phase Day	Treatment Groups			
		0 mg/L	125 mg/L	250 mg/L	500 mg/L
Urine Clarity	SD 78	(10)	(10)	(10)	(10)
Clear	SD 78	10	9	9	8
Cloudy	SD 78				
Hazy	SD 78		1	1	2
Urine Color	SD 78	(10)	(10)	(10)	(10)
Yellow	SD 78	10	10	10	10
Urine Volume (ml)	SD 78	15.6 ± 2.2 (5) **	14.7 ± 1.4 (5)	11.2 ± 2.5 (5)	10.9 ± 1.9 (5)
Specific Gravity	SD 78	1.014 ± 0.001 (5) *	1.014 ± 0.001 (5)	1.023 ± 0.006 (5)	1.018 ± 0.003 (5)
SEDIMENT EXAM					
Urine White Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Urine Red Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Casts	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Epithelial Cells	SD 78	1.1 ± 0.2 (5)	0.8 ± 0.2 (5)	0.9 ± 0.1 (5)	1.3 ± 0.1 (5)
Mucus	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Sperm	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Bacteria	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Yeast	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Amorphous Sediment	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
Crystals	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)	0.0 ± 0.0 (5)
URINE CHEMISTRIES					
Creatinine (mg/dL)	SD 78	43.7 ± 6.1 (5) *	47.8 ± 4.6 (5)	77.1 ± 22.9 (5)	58.9 ± 10.2 (5)
Percent of Control			109.4	176.4	134.8
Total Protein (mg/dL)	SD 78	14.0 ± 1.5 (5) *	23.8 ± 6.4 (5)	42.7 ± 11.8 (5)	26.6 ± 5.2 (5) *
Percent of Control			170.0	305.0	190.0
Total Protein/Creatinine	SD 78	0.3 ± 0.0 (5)	0.5 ± 0.1 (5)	0.6 ± 0.2 (5)	0.5 ± 0.1 (5)
Percent of Control			144.8	181.7	143.4
Glucose (mg/dL)	SD 78	5.1 ± 0.7 (5) *	5.8 ± 0.5 (5)	9.5 ± 2.8 (5)	6.5 ± 1.3 (5)
Percent of Control			113.7	186.3	127.5
Glucose/Creatinine	SD 78	0.12 ± 0.01 (5)	0.12 ± 0.00 (5)	0.12 ± 0.01 (5)	0.11 ± 0.00 (5)

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Lab: NTP

F1 Female

	Phase Day	Treatment Groups			
		0 mg/L	125 mg/L	250 mg/L	500 mg/L
Percent of Control			104.2	106.2	93.5
Calcium (mg/dL)	SD 78	10.7 ± 1.1 (5)	9.2 ± 1.5 (5)	14.6 ± 1.6 (5)	10.1 ± 1.7 (5)
Percent of Control			85.8	136.1	94.1
Calcium/Creatinine	SD 78	0.26 ± 0.02 (5)	0.21 ± 0.05 (5)	0.22 ± 0.04 (5)	0.18 ± 0.03 (5)
Percent of Control			79.0	83.1	70.1
Phosphorus (mg/dL)	SD 78	52.2 ± 7.7 (5)	53.0 ± 6.6 (5)	79.4 ± 19.9 (5)	76.1 ± 12.5 (5)
Percent of Control			101.5	152.0	145.7
Phosphorus/Creatinine	SD 78	1.22 ± 0.05 (5)	1.11 ± 0.09 (5)	1.07 ± 0.12 (5)	1.32 ± 0.06 (5)
Percent of Control			91.1	87.9	107.7
N-acetyl-beta-glucosaminidase (U/L)	SD 78	6.2 ± 0.6 (5) **	6.7 ± 0.5 (5)	9.1 ± 2.2 (5)	8.2 ± 0.9 (5)
Percent of Control			107.2	147.0	131.4
N-acetyl-beta-glucosaminidase/Creatinine (U/mg)	SD 78	0.01 ± 0.00 (5) *	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)
Percent of Control			94.8	85.4	98.9
Alkaline Phosphatase (U/L)	SD 78	32.0 ± 9.9 (5) **	36.8 ± 10.7 (5)	48.0 ± 13.3 (5)	50.2 ± 18.5 (5)
Percent of Control			115.0	150.0	156.9
Alkaline Phosphatase/Creatinine (U/mg)	SD 78	0.06 ± 0.01 (5) **	0.07 ± 0.02 (5)	0.06 ± 0.00 (5)	0.08 ± 0.01 (5)
Percent of Control			109.1	91.0	119.3
Aspartate Aminotransferase (U/L)	SD 78	BD	BD	BD	BD
Aspartate Aminotransferase/Creatinine (U/mg)	SD 78	BD	BD	BD	BD
Methionine Concentration in Urine (ug/mL)	SD 78	1.08 ± 0.26 (5)	1.28 ± 0.17 (5)	2.35 ± 0.81 (5)	1.35 ± 0.29 (5)
Percent of Control			118.8	217.8	124.8
Methionine Concentration/Creatinine (ug/mg)	SD 78	2.37 ± 0.22 (5)	2.68 ± 0.27 (5)	3.11 ± 0.38 (5)	2.26 ± 0.14 (5)
Percent of Control			112.8	131.0	95.1
Xanthine Concentration in Urine (ug/mL)	SD 78	0.43 ± 0.07 (5) **	0.74 ± 0.12 (5)	1.77 ± 0.54 (5) *	2.00 ± 0.35 (5) *
Percent of Control			171.0	411.1	463.9
Xanthine Concentration/Creatinine (ug/mg)	SD 78	1.02 ± 0.09 (5) **	1.51 ± 0.14 (5) *	2.27 ± 0.27 (5) **	3.39 ± 0.18 (5) **
Percent of Control			147.9	222.1	331.8
Tungsten Concentration in Urine (ug/g)	SD 78	0.029 ± 0.003 (5) **	9.102 ± 1.536 (5) **	26.403 ± 8.952 (5) **	27.647 ± 6.428 (5) **
Tungsten Concentration/Creatinine (ug/mg)	SD 78	0.071 ± 0.008 (5) **	18.884 ± 1.400 (5) **	33.548 ± 3.822 (5) **	45.588 ± 4.342 (5) **

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F1 Female

Treatment Groups

	Phase Day	1000 mg/L	2000 mg/L
Urine Clarity	SD 78	(10)	(9)
Clear	SD 78	10	6
Cloudy	SD 78		1
Hazy	SD 78		2
Urine Color	SD 78	(10)	(9)
Yellow	SD 78	10	9
Urine Volume (ml)	SD 78	8.8 ± 0.7 (5) *	6.4 ± 1.3 (4) *
Specific Gravity	SD 78	1.020 ± 0.001 (5)	1.027 ± 0.007 (4)
SEDIMENT EXAM			
Urine White Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Urine Red Blood Cells	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Casts	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Epithelial Cells	SD 78	0.9 ± 0.2 (5)	0.8 ± 0.3 (4)
Mucus	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Sperm	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Bacteria	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Yeast	SD 78	0.0 ± 0.0 (5)	0.1 ± 0.1 (4)
Amorphous Sediment	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
Crystals	SD 78	0.0 ± 0.0 (5)	0.0 ± 0.0 (4)
URINE CHEMISTRIES			
Creatinine (mg/dL)	SD 78	66.7 ± 4.1 (5)	82.3 ± 22.3 (4)
Percent of Control		152.6	188.4
Total Protein (mg/dL)	SD 78	56.0 ± 24.4 (5) *	37.7 ± 11.5 (4) *
Percent of Control		400.0	269.0
Total Protein/Creatinine	SD 78	0.8 ± 0.3 (5)	0.4 ± 0.0 (4)
Percent of Control		240.0	133.6
Glucose (mg/dL)	SD 78	7.9 ± 0.5 (5)	10.8 ± 2.5 (4)
Percent of Control		154.9	211.6
Glucose/Creatinine	SD 78	0.12 ± 0.00 (5)	0.14 ± 0.01 (4)

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F1 Female

Treatment Groups

	Phase Day	1000 mg/L	2000 mg/L
Percent of Control		100.2	117.8
Calcium (mg/dL)	SD 78	10.4 ± 1.0 (5)	16.3 ± 2.8 (4)
Percent of Control		96.6	151.9
Calcium/Creatinine	SD 78	0.15 ± 0.01 (5)	0.26 ± 0.08 (4)
Percent of Control		58.3	98.9
Phosphorus (mg/dL)	SD 78	84.0 ± 9.1 (5)	54.1 ± 15.7 (4)
Percent of Control		160.9	103.7
Phosphorus/Creatinine	SD 78	1.25 ± 0.12 (5)	0.70 ± 0.19 (4)
Percent of Control		102.1	57.0
N-acetyl-beta-glucosaminidase (U/L)	SD 78	10.3 ± 0.8 (5)	16.0 ± 2.8 (4) *
Percent of Control		166.5	257.6
N-acetyl-beta-glucosaminidase/Creatinine (U/mg)	SD 78	0.02 ± 0.00 (5)	0.02 ± 0.00 (4)
Percent of Control		106.7	142.8
Alkaline Phosphatase (U/L)	SD 78	88.4 ± 13.0 (5)	103.0 ± 31.3 (4)
Percent of Control		276.3	322.0
Alkaline Phosphatase/Creatinine (U/mg)	SD 78	0.13 ± 0.01 (5)	0.12 ± 0.01 (4)
Percent of Control		196.1	183.8
Aspartate Aminotransferase (U/L)	SD 78	BD	5.8 ± 1.6 (4)
Aspartate Aminotransferase/Creatinine (U/mg)	SD 78	BD	0.01 ± 0.00 (4)
Methionine Concentration in Urine (ug/mL)	SD 78	1.44 ± 0.12 (5)	1.27 ± 0.17 (3)
Percent of Control		133.5	117.3
Methionine Concentration/Creatinine (ug/mg)	SD 78	2.10 ± 0.04 (5)	2.71 ± 0.08 (3)
Percent of Control		88.4	114.1
Xanthine Concentration in Urine (ug/mL)	SD 78	3.30 ± 0.21 (5) *	3.72 ± 0.75 (4)
Percent of Control		765.4	865.0
Xanthine Concentration/Creatinine (ug/mg)	SD 78	5.21 ± 0.38 (5) **	7.28 ± 0.86 (4) *
Percent of Control		509.8	713.4
Tungsten Concentration in Urine (ug/g)	SD 78	98.979 ± 14.403 (5) **	182.812 ± 33.442 (4) **
Tungsten Concentration/Creatinine (ug/mg)	SD 78	142.919 ± 21.993 (5) **	280.849 ± 46.156 (4) **

Study Number: C03038-01

Test Type: TOX

Route: Dosing in Water

Species/Strain: Rat/Harlan Sprague Dawley

PA44: Urinalysis Data Summary

Test Compound: Sodium Tungstate Dihydrate

CAS Number: 10213-10-2

Date Report Requested: 09/26/2019

Time Report Requested: 07:01:30

Lab: NTP

LEGEND

Values given as mean \pm SEM (N) of the litter means with Percent of Control calculated by (dosed group mean / control group mean) x 100

SD – Study Day

Urine Clarity and Color values are given as an incidence count with number examined in parentheses

Sediment Exam values are given as a mean grade and count

No statistical analyses were performed on graded or qualitative endpoints.

Values below the limit of detection (LOD) were substituted with 1/2 the LOD value.

If 80% or more of the values in a dose group were below the LOD, no statistical analysis was performed.

Statistical analysis for urine chemistry, volume, and specific gravity data was performed using a bootstrapped Jonckheere test for trend and a Datta-Satten modified Wilcoxon test with Hommel adjustment for pairwise comparisons.

Statistical significance for the control group indicates a significant trend test

Statistical significance for a treatment group indicates a significant pairwise test compared to the vehicle control group

* Statistically significant at $P \leq 0.05$

** Statistically significant at $P \leq 0.01$

Urine Sediment Grading Criteria:

Epithelial Cells 0=0-1, 1=2-5, 2=6-10, 3=11-20, 4=20

Casts 0=0, 1=1-5, 2=6-10, 3=11-20, 4=20+

Crystals (Rabbits/Guinea Pigs-Calcium Carbonate) 0=0-20, 1=21-40, 2=41-60, 3=61-80, 4=81+

Red Blood Cells 0=0-5, 1=6-10, 2=11-25, 3=26-50, 4=50+

White Blood Cells 0=0-5, 1=5-10, 2=11-15, 3=16-25, 4=25+

Sperm 0=0, 1=1-5, 2=6-10, 3=11-20, 4=20+

Yeast 0=0, 1=1-10, 2=11-25, 3=26-50, 4=50+

Mucus 0=0, 1=10-25, 2=26-50, 3=51-75, 4=>75

Bacteria 0=0, 1=10-25, 2=26-50, 3=51-75, 4=>75

Amorphous Sediment 0=0, 1=10-25, 2=26-50, 3=51-75, 4=>75

BD - Group did not have over 20% of its values above the limit of detection.

**** END OF REPORT ****