

**Study Number:** C03038-01

**Test Type:** TOX

**Route:** Dosing in Water

**Species/Strain:** Rat/Harlan Sprague Dawley

**C Number:**

**Study Gender:**

**PWG Approval Date**

**PA43: Hematology 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:** 05/06/2019

**Time Report Requested:** 15:09:53

**Lab:** NTP

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F1 Male

	Phase Day	Treatment Groups (mg/L)			
		0	125	250	500
Hematocrit (%)	SD 91	50.0 ± 1.2 (5) **	48.2 ± 0.9 (5)	49.3 ± 0.5 (5)	48.5 ± 0.6 (5)
Percent of Control			96.4	98.7	97.1
Manual Hematocrit (%)	SD 91	48.7 ± 0.8 (5) **	48.1 ± 0.9 (5)	49.1 ± 0.6 (5)	48.2 ± 0.4 (5)
Percent of Control			98.8	100.8	99.0
Hemoglobin (g/dL)	SD 91	15.2 ± 0.3 (5) **	14.9 ± 0.2 (5)	15.3 ± 0.1 (5)	15.2 ± 0.1 (5)
Percent of Control			98.2	100.7	100.1
Erythrocytes (10 <sup>6</sup> /uL)	SD 91	8.69 ± 0.18 (5) *	8.45 ± 0.10 (5)	8.72 ± 0.10 (5)	8.54 ± 0.13 (5)
Percent of Control			97.23	100.40	98.30
Reticulocytes (10 <sup>3</sup> /uL)	SD 91	202.0 ± 8.0 (5)	206.1 ± 9.4 (5)	198.1 ± 9.0 (5)	212.6 ± 11.5 (5)
Percent of Control			102.0	98.1	105.2
Mean Cell Volume (fL)	SD 91	57.5 ± 0.7 (5)	57.1 ± 0.8 (5)	56.6 ± 1.0 (5)	56.8 ± 0.6 (5)
Percent of Control			99.2	98.4	98.8
Mean Cell Hemoglobin (pg)	SD 91	17.5 ± 0.2 (5)	17.7 ± 0.2 (5)	17.6 ± 0.3 (5)	17.9 ± 0.2 (5)
Percent of Control			100.9	100.4	102.0
Mean Cell Hemoglobin Concentration (g/dL)	SD 91	30.5 ± 0.3 (5) *	31.0 ± 0.2 (5)	31.1 ± 0.2 (5)	31.4 ± 0.2 (5)
Percent of Control			101.6	102.0	103.1
Platelets (10 <sup>3</sup> /uL)	SD 91	854 ± 39 (5)	890 ± 58 (5)	835 ± 27 (5)	819 ± 71 (5)
Percent of Control			104	98	96
White Blood Cells (10 <sup>3</sup> /uL)	SD 91	12.01 ± 1.50 (5)	10.34 ± 0.48 (5)	11.04 ± 0.83 (5)	12.36 ± 0.90 (5)
Percent of Control			86.14	91.97	102.93
Neutrophils (10 <sup>3</sup> /uL)	SD 91	1.30 ± 0.10 (5)	1.34 ± 0.12 (5)	1.15 ± 0.14 (5)	1.32 ± 0.10 (5)
Percent of Control			102.38	88.42	101.00

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F1 Male

	Phase Day	Treatment Groups (mg/L)			
		0	125	250	500
Total Lymphocytes (10 <sup>3</sup> /uL)	SD 91	10.24 ± 1.39 (5)	8.62 ± 0.37 (5)	9.48 ± 0.74 (5)	10.52 ± 0.77 (5)
Percent of Control			84.16	92.53	102.69
Monocytes (10 <sup>3</sup> /uL)	SD 91	0.32 ± 0.06 (5)	0.27 ± 0.01 (5)	0.27 ± 0.04 (5)	0.40 ± 0.04 (5)
Percent of Control			84.01	83.39	125.39
Basophils (10 <sup>3</sup> /uL)	SD 91	0.04 ± 0.01 (5)	0.03 ± 0.00 (5)	0.03 ± 0.00 (5)	0.04 ± 0.01 (5)
Percent of Control			71.79	82.05	102.56
Eosinophils (10 <sup>3</sup> /uL)	SD 91	0.11 ± 0.01 (5)	0.09 ± 0.01 (5)	0.11 ± 0.02 (5)	0.09 ± 0.02 (5)
Percent of Control			87.62	107.62	82.86

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	Phase Day	Treatment Groups (mg/L)	
		1000	2000
Hematocrit (%)	SD 91	46.8 ± 0.8 (5)	45.7 ± 1.1 (4)
Percent of Control		93.6	91.4
Manual Hematocrit (%)	SD 91	46.5 ± 0.7 (5)	45.1 ± 0.7 (4)
Percent of Control		95.5	92.6
Hemoglobin (g/dL)	SD 91	14.6 ± 0.3 (5)	14.3 ± 0.3 (4)
Percent of Control		96.1	93.9
Erythrocytes (10 <sup>6</sup> /uL)	SD 91	8.23 ± 0.15 (5)	8.13 ± 0.22 (4)
Percent of Control		94.74	93.59
Reticulocytes (10 <sup>3</sup> /uL)	SD 91	213.9 ± 9.9 (5)	225.0 ± 7.7 (4)
Percent of Control		105.9	111.4
Mean Cell Volume (fL)	SD 91	56.9 ± 0.3 (5)	56.3 ± 0.7 (4)
Percent of Control		98.8	97.8
Mean Cell Hemoglobin (pg)	SD 91	17.8 ± 0.0 (5)	17.6 ± 0.2 (4)
Percent of Control		101.4	100.4
Mean Cell Hemoglobin Concentration (g/dL)	SD 91	31.2 ± 0.2 (5)	31.3 ± 0.2 (4)
Percent of Control		102.5	102.6
Platelets (10 <sup>3</sup> /uL)	SD 91	941 ± 43 (5)	833 ± 49 (4)
Percent of Control		110	98
White Blood Cells (10 <sup>3</sup> /uL)	SD 91	9.80 ± 0.99 (5)	8.79 ± 1.01 (4)
Percent of Control		81.61	73.20
Neutrophils (10 <sup>3</sup> /uL)	SD 91	1.13 ± 0.27 (5)	1.02 ± 0.09 (4)
Percent of Control		86.27	78.00

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**F1 Male**

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	Phase Day	Treatment Groups (mg/L)	
		1000	2000
Total Lymphocytes (10 <sup>3</sup> /uL)	SD 91	8.30 ± 0.68 (5)	7.46 ± 0.89 (4)
Percent of Control		81.07	72.80
Monocytes (10 <sup>3</sup> /uL)	SD 91	0.26 ± 0.06 (5)	0.24 ± 0.04 (4)
Percent of Control		82.13	74.84
Basophils (10 <sup>3</sup> /uL)	SD 91	0.03 ± 0.01 (5)	0.02 ± 0.01 (4)
Percent of Control		74.36	42.74
Eosinophils (10 <sup>3</sup> /uL)	SD 91	0.08 ± 0.01 (5)	0.06 ± 0.01 (4)
Percent of Control		76.19	57.54

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F1 Female

	Phase Day	Treatment Groups (mg/L)			
		0	125	250	500
Hematocrit (%)	SD 91	44.7 ± 0.6 (5) *	45.5 ± 0.9 (5)	44.4 ± 0.6 (5)	44.6 ± 0.7 (5)
Percent of Control			101.8	99.2	99.6
Manual Hematocrit (%)	SD 91	44.7 ± 0.6 (5) *	45.3 ± 0.7 (5)	45.7 ± 0.2 (5)	44.4 ± 0.5 (5)
Percent of Control			101.3	102.2	99.3
Hemoglobin (g/dL)	SD 91	14.2 ± 0.1 (5) *	14.3 ± 0.3 (5)	14.1 ± 0.2 (5)	14.2 ± 0.1 (5)
Percent of Control			100.8	99.9	100.1
Erythrocytes (10 <sup>6</sup> /uL)	SD 91	7.80 ± 0.07 (5) *	7.87 ± 0.14 (5)	7.78 ± 0.05 (5)	7.70 ± 0.08 (5)
Percent of Control			100.95	99.83	98.69
Reticulocytes (10 <sup>3</sup> /uL)	SD 91	195.3 ± 14.4 (5)	201.1 ± 15.1 (5)	191.1 ± 13.8 (5)	224.8 ± 9.2 (5)
Percent of Control			103.0	97.8	115.1
Mean Cell Volume (fL)	SD 91	57.4 ± 0.5 (5)	57.8 ± 1.0 (5)	57.0 ± 0.6 (5)	57.9 ± 0.5 (5)
Percent of Control			100.8	99.4	100.9
Mean Cell Hemoglobin (pg)	SD 91	18.2 ± 0.1 (5)	18.2 ± 0.3 (5)	18.2 ± 0.2 (5)	18.5 ± 0.2 (5)
Percent of Control			99.9	99.8	101.5
Mean Cell Hemoglobin Concentration (g/dL)	SD 91	31.7 ± 0.1 (5)	31.4 ± 0.1 (5)	31.8 ± 0.3 (5)	31.9 ± 0.3 (5)
Percent of Control			99.1	100.3	100.5
Platelets (10 <sup>3</sup> /uL)	SD 91	894 ± 64 (5)	910 ± 70 (5)	854 ± 63 (5)	959 ± 44 (5)
Percent of Control			102	96	107
White Blood Cells (10 <sup>3</sup> /uL)	SD 91	9.26 ± 1.21 (5)	8.05 ± 0.82 (5)	8.77 ± 0.75 (5)	9.07 ± 0.50 (5)
Percent of Control			86.91	94.73	97.97
Neutrophils (10 <sup>3</sup> /uL)	SD 91	1.26 ± 0.18 (5)	1.15 ± 0.13 (5)	0.97 ± 0.06 (5)	1.05 ± 0.10 (5)
Percent of Control			91.28	77.02	82.96

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F1 Female

	Phase Day	Treatment Groups (mg/L)			
		0	125	250	500
Total Lymphocytes ( $10^3/\mu\text{L}$ )	SD 91	7.59 ± 0.99 (5)	6.56 ± 0.70 (5)	7.46 ± 0.68 (5)	7.64 ± 0.38 (5)
Percent of Control			86.46	98.23	100.63
Monocytes ( $10^3/\mu\text{L}$ )	SD 91	0.27 ± 0.04 (5)	0.21 ± 0.04 (5)	0.21 ± 0.03 (5)	0.28 ± 0.04 (5)
Percent of Control			77.32	79.55	102.60
Basophils ( $10^3/\mu\text{L}$ )	SD 91	0.03 ± 0.01 (5)	0.02 ± 0.00 (5)	0.02 ± 0.01 (5)	0.02 ± 0.00 (5)
Percent of Control			65.52	82.76	75.86
Eosinophils ( $10^3/\mu\text{L}$ )	SD 91	0.11 ± 0.03 (5)	0.11 ± 0.01 (5)	0.11 ± 0.02 (5)	0.09 ± 0.02 (5)
Percent of Control			99.08	100.92	81.65

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F1 Female

	Phase Day	Treatment Groups (mg/L)	
		1000	2000
Hematocrit (%)	SD 91	44.5 ± 0.8 (5)	42.3 ± 0.2 (4)
Percent of Control		99.4	94.5
Manual Hematocrit (%)	SD 91	44.4 ± 1.0 (5)	42.5 ± 0.1 (4) *
Percent of Control		99.3	95.1
Hemoglobin (g/dL)	SD 91	14.0 ± 0.2 (5)	13.4 ± 0.1 (4) *
Percent of Control		98.7	94.6
Erythrocytes (10 <sup>6</sup> /uL)	SD 91	7.73 ± 0.07 (5)	7.38 ± 0.12 (4)
Percent of Control		99.08	94.68
Reticulocytes (10 <sup>3</sup> /uL)	SD 91	192.1 ± 14.2 (5)	223.7 ± 16.7 (4)
Percent of Control		98.4	114.5
Mean Cell Volume (fL)	SD 91	57.6 ± 0.7 (5)	57.3 ± 0.9 (4)
Percent of Control		100.3	99.9
Mean Cell Hemoglobin (pg)	SD 91	18.1 ± 0.2 (5)	18.2 ± 0.2 (4)
Percent of Control		99.6	99.9
Mean Cell Hemoglobin Concentration (g/dL)	SD 91	31.5 ± 0.2 (5)	31.7 ± 0.1 (4)
Percent of Control		99.1	99.8
Platelets (10 <sup>3</sup> /uL)	SD 91	869 ± 48 (5)	891 ± 27 (4)
Percent of Control		97	100
White Blood Cells (10 <sup>3</sup> /uL)	SD 91	8.95 ± 0.53 (5)	9.64 ± 0.90 (4)
Percent of Control		96.58	104.13
Neutrophils (10 <sup>3</sup> /uL)	SD 91	1.23 ± 0.23 (5)	1.06 ± 0.12 (4)
Percent of Control		97.15	83.99



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**F1 Female**

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	<b>Phase Day</b>	<b>Treatment Groups (mg/L)</b>	
		<b>1000</b>	<b>2000</b>
Total Lymphocytes (10 <sup>3</sup> /uL)	SD 91	7.30 ± 0.25 (5)	8.18 ± 0.76 (4)
Percent of Control		96.15	107.72
Monocytes (10 <sup>3</sup> /uL)	SD 91	0.31 ± 0.07 (5)	0.28 ± 0.02 (4)
Percent of Control		115.24	103.31
Basophils (10 <sup>3</sup> /uL)	SD 91	0.02 ± 0.00 (5)	0.03 ± 0.01 (4)
Percent of Control		82.76	87.64
Eosinophils (10 <sup>3</sup> /uL)	SD 91	0.09 ± 0.01 (5)	0.10 ± 0.01 (4)
Percent of Control		78.90	91.36

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LEGEND

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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

Statistical analysis 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  $P \leq 0.01$

**\*\* END OF REPORT \*\***