

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

C Number:	R92025B
Cage Range:	All
Date Range:	All
Reasons For Removal:	All
Removal Date Range:	All
Treatment Groups:	All
Study Gender:	Both

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F1 Pups - Litter A

Treatment Groups (ppm)

	0	750	2500	5000
Total Pups (PND 0)	322	292	168	34
No. pups post cull (PND 4)				
Total Litters (PND 0)	22	22	17	6
No. litters post cull (PND 4)				

Pup Clinical Observations PND 0-4

Abnormal Posture	0	0	1 (0.6)	0
	0	0	1 (5.9) PND 0	0
Anal Atresia	0	0	1 (0.6)	0
	0	0	1 (5.9) PND 0	0
Bruising Abdomen	2 (0.6)	2 (0.7)	8 (4.8)	7 (20.6)
	2 (9.1)	2 (9.1)	4 (23.5)	1 (16.7)
	PND 0-3	PND 0-3	PND 0-4	PND 0-2
Bruising Back	0	1 (0.3)	1 (0.6)	3 (8.8)
	0	1 (4.5) PND 1-2	1 (5.9) PND 0	1 (16.7) PND 0-2
Bruising Chest	0	2 (0.7)	0	0
	0	2 (9.1) PND 0-4	0	0

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F1 Pups - Litter A

	Treatment Groups (ppm)			
	0	750	2500	5000
Bruising	4 (1.2)	2 (0.7)	8 (4.8)	1 (2.9)
Face	4 (18.2)	2 (9.1)	6 (35.3)	1 (16.7)
	PND 0-1	PND 0-1	PND 0-4	PND 0
Bruising	0	0	1 (0.6)	4 (11.8)
Head	0	0	1 (5.9)	1 (16.7)
			PND 0	PND 0-1
Bruising	0	0	1 (0.6)	0
Left Hind Paw	0	0	1 (5.9)	0
			PND 0-4	
Bruising	0	1 (0.3)	2 (1.2)	0
Neck	0	1 (4.5)	1 (5.9)	0
		PND 3-4	PND 0	
Bruising	0	1 (0.3)	1 (0.6)	0
Right Hind Paw	0	1 (4.5)	1 (5.9)	0
		PND 0-3	PND 0-4	
Bruising	0	0	1 (0.6)	0
Right Hindlimb	0	0	1 (5.9)	0
			PND 0	
Cold To Touch	1 (0.3)	0	0	0
	1 (4.5)	0	0	0
	PND 0			

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F1 Pups - Litter A

	Treatment Groups (ppm)			
	0	750	2500	5000
Cyanosed	0	2 (0.7)	0	0
	0	2 (9.1) PND 0	0	0
Dehydrated	0	0	1 (0.6)	0
	0	0	1 (5.9) PND 2	0
Edema	0	0	3 (1.8)	0
	0	0	2 (11.8) PND 0	0
No Milk in Stomach	0	1 (0.3)	2 (1.2)	1 (2.9)
	0	1 (4.5) PND 1	2 (11.8) PND 0-2	1 (16.7) PND 0
Pale	4 (1.2)	2 (0.7)	4 (2.4)	0
	4 (18.2) PND 0-4	2 (9.1) PND 0-2	4 (23.5) PND 0-2	0
Pup - Found Dead	24 (7.5)	15 (5.1)	36 (21.4)	19 (55.9)
	14 (63.6) PND 0-3	9 (40.9) PND 0-3	11 (64.7) PND 0-4	4 (66.7) PND 0-3
Pup Cannibalised	1 (0.3)	1 (0.3)	9 (5.4)	7 (20.6)
	1 (4.5) PND 0	1 (4.5) PND 0	4 (23.5) PND 0-1	3 (50.0) PND 0

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F1 Pups - Litter A

	Treatment Groups (ppm)			
	0	750	2500	5000
Pup Missing - Presumed Dead	1 (0.3)	1 (0.3)	4 (2.4)	6 (17.6)
	1 (4.5)	1 (4.5)	2 (11.8)	2 (33.3)
	PND 1	PND 1	PND 1	PND 1
Sore(s) On Body Anus	2 (0.6)	0	0	0
	2 (9.1)	0	0	0
	PND 0-2			
Sore(s) On Body Chest	1 (0.3)	0	0	0
	1 (4.5)	0	0	0
	PND 0-4			
Sore(s) On Body Nose/Snout	2 (0.6)	1 (0.3)	0	0
	2 (9.1)	1 (4.5)	0	0
	PND 0-2	PND 0-4		
Swelling Right Hind Paw	0	1 (0.3)	0	0
	0	1 (4.5)	0	0
		PND 0-1		
Tail Tip Missing	0	0	2 (1.2)	0
	0	0	2 (11.8)	0
			PND 0-4	

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F1 Pups - Litter B

Treatment Groups (ppm)

	0	750	2500	5000
Total Pups (PND 0)	270	311	157	28
No. pups post cull (PND 4)				
Total Litters (PND 0)	19	23	17	6
No. litters post cull (PND 4)				

Pup Clinical Observations PND 0-4

Abnormal Posture	0	1 (0.3)	0	0
	0	1 (4.3)	0	0
		PND 4		
Bruising	1 (0.4)	0	2 (1.3)	1 (3.6)
Abdomen	1 (5.3)	0	2 (11.8)	1 (16.7)
	PND 0-2		PND 0-2	PND 1-2
Bruising	0	0	2 (1.3)	0
Back	0	0	2 (11.8)	0
			PND 0-2	
Bruising	0	1 (0.3)	7 (4.5)	0
Face	0	1 (4.3)	6 (35.3)	0
		PND 0-1	PND 0-1	
Bruising	0	0	1 (0.6)	0
Head	0	0	1 (5.9)	0
			PND 1	

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F1 Pups - Litter B

	Treatment Groups (ppm)			
	0	750	2500	5000
Bruising	0	0	2 (1.3)	0
Left Hind Paw	0	0	2 (11.8) PND 0-2	0
Bruising	0	1 (0.3)	0	0
Neck	0	1 (4.3) PND 0	0	0
Bruising	0	0	1 (0.6)	0
Right Hind Paw	0	0	1 (5.9) PND 0	0
Cold To Touch	2 (0.7) 2 (10.5) PND 0	1 (0.3) 1 (4.3) PND 4	0 0	0 0
Cyanosed	1 (0.4) 1 (5.3) PND 0	0 0	0 0	0 0
Dehydrated	0 0	1 (0.3) 1 (4.3) PND 4	0 0	0 0
No Milk in Stomach	1 (0.4) 1 (5.3) PND 0	5 (1.6) 4 (17.4) PND 0-4	0 0	0 0

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F1 Pups - Litter B

	Treatment Groups (ppm)			
	0	750	2500	5000
Pale	1 (0.4)	3 (1.0)	8 (5.1)	0
	1 (5.3)	2 (8.7)	5 (29.4)	0
	PND 2	PND 0-2	PND 0-2	
Pup - Found Dead	14 (5.2)	17 (5.5)	19 (12.1)	9 (32.1)
	6 (31.6)	10 (43.5)	11 (64.7)	4 (66.7)
	PND 0-3	PND 0-4	PND 0-3	PND 0
Pup Cannibalised	2 (0.7)	3 (1.0)	2 (1.3)	11 (39.3)
	1 (5.3)	3 (13.0)	2 (11.8)	4 (66.7)
	PND 1	PND 0-1	PND 0-1	PND 0
Pup Missing - Presumed Dead	3 (1.1)	3 (1.0)	5 (3.2)	3 (10.7)
	2 (10.5)	3 (13.0)	2 (11.8)	2 (33.3)
	PND 1	PND 1-3	PND 1	PND 0-1
Respiration	0	2 (0.6)	0	0
Audible	0	1 (4.3)	0	0
		PND 4		
Sore(s) On Body	0	1 (0.3)	0	0
Abdomen	0	1 (4.3)	0	0
		PND 0-2		
Sore(s) On Body	0	1 (0.3)	0	0
Face	0	1 (4.3)	0	0
		PND 4		

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F1 Pups - Litter C

Treatment Groups (ppm)

	0	750	2500
Total Pups (PND 0)	259	282	169
No. pups post cull (PND 4)	202	243	134
Total Litters (PND 0)	19	22	16
No. litters post cull (PND 4)	19	22	15

Pup Clinical Observations PND 0-4

Bruising	0	0	3 (1.8)
Abdomen	0	0	3 (18.8) PND 1-4
Bruising	1 (0.4)	0	3 (1.8)
Back	1 (5.3) PND 2-3	0	1 (6.2) PND 0
Bruising	0	1 (0.4)	4 (2.4)
Face	0	1 (4.5) PND 1	3 (18.8) PND 0-2
Bruising	1 (0.4)	1 (0.4)	1 (0.6)
Head	1 (5.3) PND 1-3	1 (4.5) PND 0-3	1 (6.2) PND 0
Bruising	0	1 (0.4)	0
Right Hindlimb	0	1 (4.5) PND 1	0

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F1 Pups - Litter C

	Treatment Groups (ppm)		
	0	750	2500
Cyanosed	1 (0.4) 1 (5.3) PND 0	1 (0.4) 1 (4.5) PND 0	0 0
Dehydrated	0 0	1 (0.4) 1 (4.5) PND 4	0 0
Edema	0 0	0 0	1 (0.6) 1 (6.2) PND 0
No Milk in Stomach	3 (1.2) 1 (5.3) PND 0-3	2 (0.7) 1 (4.5) PND 4	0 0
Pale	1 (0.4) 1 (5.3) PND 0	0 0	4 (2.4) 4 (25.0) PND 0-4
Pup - Found Dead	30 (11.6) 12 (63.2) PND 0-3	10 (3.5) 6 (27.3) PND 0-4	16 (9.5) 5 (31.2) PND 0-2
Pup Cannibalised	1 (0.4) 1 (5.3) PND 1	1 (0.4) 1 (4.5) PND 1	2 (1.2) 2 (12.5) PND 0

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F1 Pups - Litter C

Treatment Groups (ppm)

	0	750	2500
Pup Missing - Presumed Dead	4 (1.5) 4 (21.1) PND 1-4	1 (0.4) 1 (4.5) PND 2	10 (5.9) 2 (12.5) PND 1-3
Respiration	0	4 (1.4)	1 (0.6)
Audible	0	1 (4.5) PND 4	1 (6.2) PND 4
Scab(s)	0	0	1 (0.6)
Face	0	0	1 (6.2) PND 4
Scab(s)	0	1 (0.4)	0
Nose/Snout	0	1 (4.5) PND 1-4	0
Sore(s) On Body	0	0	1 (0.6)
Right Shoulder	0	0	1 (6.2) PND 1-4
Pup Clinical Observations PND 5-28			
Alopecia	1 (0.5)	0	0
Multiple Sites (>2)	1 (5.3) PND 23-28	0	0

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F1 Pups - Litter C

	Treatment Groups (ppm)		
	0	750	2500
Alopecia	0	0	1 (0.7)
Right Shoulder	0	0	1 (6.7) PND 11-13
Bruising	0	0	1 (0.7)
Abdomen	0	0	1 (6.7) PND 5
Cold To Touch	0	0	2 (1.5)
	0	0	2 (13.3) PND 6-10
Dehydrated	1 (0.5)	2 (0.8)	0
	1 (5.3) PND 13	2 (9.1) PND 10-11	0
Distended	0	0	1 (0.7)
Abdomen	0	0	1 (6.7) PND 13
Emaciated	0	1 (0.4)	1 (0.7)
	0	1 (4.5) PND 11	1 (6.7) PND 6
Lethargic	0	0	2 (1.5)
	0	0	2 (13.3) PND 6-10

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F1 Pups - Litter C

	Treatment Groups (ppm)		
	0	750	2500
No Milk in Stomach	1 (0.5)	10 (4.1)	12 (9.0)
	1 (5.3)	5 (22.7)	8 (53.3)
	PND 6	PND 5-11	PND 5-13
Pup - Found Dead	1 (0.5)	5 (2.1)	3 (2.2)
	1 (5.3)	3 (13.6)	2 (13.3)
	PND 6	PND 5-7	PND 7-12
Pup Cannibalised	1 (0.5)	1 (0.4)	0
	1 (5.3)	1 (4.5)	0
	PND 11	PND 7	
Pup Missing - Presumed Dead	1 (0.5)	3 (1.2)	1 (0.7)
	1 (5.3)	2 (9.1)	1 (6.7)
	PND 7	PND 6-8	PND 12
Respiration Audible	0	3 (1.2)	0
	0	1 (4.5)	0
		PND 7-11	
Respiration Labored	0	0	1 (0.7)
	0	0	1 (6.7)
			PND 10
Scab(s) Face	0	0	1 (0.7)
	0	0	1 (6.7)
			PND 5-6

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F1 Pups - Litter C

	Treatment Groups (ppm)		
	0	750	2500
Scab(s)	0	1 (0.4)	0
Nose/Snout	0	1 (4.5) PND 5-6	0
Scab(s)	0	0	1 (0.7)
Right Shoulder	0	0	1 (6.7) PND 6-10
Skin	0	1 (0.4)	0
Dry	0	1 (4.5) PND 13	0
Sore(s) On Body	1 (0.5)	0	0
Back	1 (5.3) PND 13-14	0	0
Sore(s) On Body	0	1 (0.4)	0
Face	0	1 (4.5) PND 13-14	0
Sore(s) On Body	0	0	1 (0.7)
Right Shoulder	0	0	1 (6.7) PND 5
Tail Damaged	7 (3.5)	3 (1.2)	1 (0.7)
	2 (10.5) PND 12-28	3 (13.6) PND 10-28	1 (6.7) PND 25-28

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F1 Pups - Litter D

	Treatment Groups (ppm)	
	0	2500
Total Pups (PND 0)	137	113
No. pups post cull (PND 4)		
Total Litters (PND 0)	12	10
No. litters post cull (PND 4)		

Pup Clinical Observations PND 0-4

Bruising	1 (0.7)	2 (1.8)
Abdomen	1 (8.3)	2 (20.0)
	PND 2-4	PND 0-4
Bruising	0	2 (1.8)
Face	0	2 (20.0)
		PND 0-4
Bruising	0	2 (1.8)
Head	0	2 (20.0)
		PND 1-4
Bruising	0	1 (0.9)
Left Hindlimb	0	1 (10.0)
		PND 2-4
Bruising	0	1 (0.9)
Right Hindlimb	0	1 (10.0)
		PND 0-4

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F1 Pups - Litter D

	Treatment Groups (ppm)	
	0	2500
No Milk in Stomach	1 (0.7) 1 (8.3) PND 0	2 (1.8) 1 (10.0) PND 0
Pale	1 (0.7) 1 (8.3) PND 0	0 0
Pup - Found Dead	9 (6.6) 4 (33.3) PND 0	11 (9.7) 6 (60.0) PND 0-1
Pup Cannibalised	0 0	2 (1.8) 2 (20.0) PND 1
Pup Missing - Presumed Dead	1 (0.7) 1 (8.3) PND 1	4 (3.5) 4 (40.0) PND 1
Respiration Labored	1 (0.7) 1 (8.3) PND 0	0 0

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F1 Pups - Litter E

	Treatment Groups (ppm)		
	0 NF	2500 NF	5000 NF
Total Pups (PND 0)	220	174	70
No. pups post cull (PND 4)			
Total Litters (PND 0)	16	15	6
No. litters post cull (PND 4)			

Pup Clinical Observations PND 0-4

Bruising	2 (0.9)	0	0
Back	2 (12.5)	0	0
	PND 0-1		
Bruising	1 (0.5)	0	0
Chest	1 (6.2)	0	0
	PND 0		
Bruising	3 (1.4)	2 (1.1)	1 (1.4)
Face	3 (18.8)	2 (13.3)	1 (16.7)
	PND 0-3	PND 0-2	PND 1
Bruising	1 (0.5)	0	0
Head	1 (6.2)	0	0
	PND 0		
Bruising	1 (0.5)	0	0
Right Fore Paw	1 (6.2)	0	0
	PND 0		

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F1 Pups - Litter E

	Treatment Groups (ppm)		
	0 NF	2500 NF	5000 NF
Bruising	2 (0.9)	0	0
Right Hind Paw	2 (12.5) PND 0-3	0	0
Bruising	1 (0.5)	0	0
Right Hindlimb	1 (6.2) PND 1-3	0	0
Cold To Touch	1 (0.5)	0	0
	1 (6.2) PND 1	0	0
Cyanosed	1 (0.5)	0	0
	1 (6.2) PND 0-2	0	0
No Milk in Stomach	0	4 (2.3)	1 (1.4)
	0	1 (6.7) PND 3-4	1 (16.7) PND 4
Pale	2 (0.9)	3 (1.7)	2 (2.9)
	1 (6.2) PND 2-3	2 (13.3) PND 0-3	1 (16.7) PND 2-4
Pup - Found Dead	10 (4.5)	21 (12.1)	1 (1.4)
	7 (43.8) PND 0-4	8 (53.3) PND 0-4	1 (16.7) PND 1

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F1 Pups - Litter E

	Treatment Groups (ppm)		
	0 NF	2500 NF	5000 NF
Pup Cannibalised	0	0	1 (1.4)
	0	0	1 (16.7)
			PND 0
Pup Missing - Presumed Dead	1 (0.5)	1 (0.6)	0
	1 (6.2)	1 (6.7)	0
	PND 2	PND 1	
Respiration Slow	1 (0.5)	0	0
	1 (6.2)	0	0
	PND 0		
Tail Damaged	1 (0.5)	0	0
	1 (6.2)	0	0
	PND 1		

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter A F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Total Pups (PND 0)	434	375	284
No. pups post cull (PND 4)			
Total Litters (PND 0)	33	34	31
No. litters post cull (PND 4)			
Pup Clinical Observations PND 0-4			
Bruising	0	0	1 (0.4)
Abdomen	0	0	1 (3.2) PND 0
Bruising	0	1 (0.3)	0
Anus	0	1 (2.9) PND 0	0
Bruising	2 (0.5)	0	0
Back	2 (6.1) PND 1-4	0	0
Bruising	4 (0.9)	7 (1.9)	11 (3.9)
Face	3 (9.1) PND 0-4	6 (17.6) PND 0-3	7 (22.6) PND 0-4
Bruising	1 (0.2)	0	2 (0.7)
Head	1 (3.0) PND 0-2	0	2 (6.5) PND 0-4

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter A F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Bruising	0	2 (0.5)	1 (0.4)
Multiple Sites (>2)	0	2 (5.9) PND 0-4	1 (3.2) PND 1-3
Bruising	0	0	1 (0.4)
Right Hindlimb	0	0	1 (3.2) PND 0-1
Cold To Touch	4 (0.9) 3 (9.1) PND 0-2	3 (0.8) 2 (5.9) PND 0-4	0 0
Cyanosed	1 (0.2) 1 (3.0) PND 0	1 (0.3) 1 (2.9) PND 0	0 0
Edema	0 0	0 0	2 (0.7) 1 (3.2) PND 0
Emaciated	1 (0.2) 1 (3.0) PND 4	0 0	0 0
No Milk in Stomach	5 (1.2) 3 (9.1) PND 4	1 (0.3) 1 (2.9) PND 4	0 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter A F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Pale	1 (0.2) 1 (3.0) PND 4	0 0	10 (3.5) 7 (22.6) PND 0-4
Pup - Found Dead	83 (19.1) 24 (72.7) PND 0-3	64 (17.1) 23 (67.6) PND 0-4	59 (20.8) 24 (77.4) PND 0-3
Pup Cannibalised	1 (0.2) 1 (3.0) PND 1	1 (0.3) 1 (2.9) PND 0	8 (2.8) 4 (12.9) PND 0-1
Pup Missing - Presumed Dead	6 (1.4) 5 (15.2) PND 0-4	9 (2.4) 5 (14.7) PND 0-1	36 (12.7) 16 (51.6) PND 1-2
Skin Discolored White	0 0	1 (0.3) 1 (2.9) PND 1-4	0 0
Sore(s) On Body Abdomen	1 (0.2) 1 (3.0) PND 0-4	0 0	0 0
Tail Tip Missing	0 0	0 0	2 (0.7) 2 (6.5) PND 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter B F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Total Pups (PND 0)	518	455	303
No. pups post cull (PND 4)			
Total Litters (PND 0)	34	37	29
No. litters post cull (PND 4)			

Pup Clinical Observations PND 0-4

Bruising	1 (0.2)	1 (0.2)	17 (5.6)
Abdomen	1 (2.9)	1 (2.7)	3 (10.3)
	PND 1	PND 2	PND 0-2
Bruising	2 (0.4)	0	1 (0.3)
Back	2 (5.9)	0	1 (3.4)
	PND 1-4		PND 1-3
Bruising	2 (0.4)	4 (0.9)	3 (1.0)
Face	2 (5.9)	4 (10.8)	3 (10.3)
	PND 0-1	PND 0-1	PND 0-2
Bruising	1 (0.2)	0	0
Head	1 (2.9)	0	0
	PND 1		
Bruising	0	0	1 (0.3)
Left Hind Paw	0	0	1 (3.4)
			PND 0-2

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter B F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Bruising	0	0	1 (0.3)
Left Hindlimb	0	0	1 (3.4) PND 0-1
Bruising	0	1 (0.2)	0
Multiple Sites (>2)	0	1 (2.7) PND 0	0
Bruising	0	0	1 (0.3)
Right Hind Paw	0	0	1 (3.4) PND 0-2
Bruising	0	0	1 (0.3)
Right Hindlimb	0	0	1 (3.4) PND 0-1
Bruising	1 (0.2)	0	0
Tail	1 (2.9) PND 0-4	0	0
Cold To Touch	1 (0.2)	0	0
	1 (2.9) PND 3-4	0	0
No Milk in Stomach	2 (0.4)	0	1 (0.3)
	2 (5.9) PND 4	0	1 (3.4) PND 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter B F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Pale	1 (0.2) 1 (2.9) PND 0	0 0	4 (1.3) 4 (13.8) PND 0-4
Pup - Found Dead	67 (12.9) 25 (73.5) PND 0-3	28 (6.2) 18 (48.6) PND 0-4	30 (9.9) 17 (58.6) PND 0-4
Pup Cannibalised	2 (0.4) 2 (5.9) PND 0	0 0	3 (1.0) 3 (10.3) PND 0-1
Pup Missing - Presumed Dead	5 (1.0) 3 (8.8) PND 1-4	7 (1.5) 4 (10.8) PND 1-4	15 (5.0) 11 (37.9) PND 1-4
Scab(s) Right Shoulder	0 0	0 0	1 (0.3) 1 (3.4) PND 3-4
Sore(s) On Body Back	0 0	0 0	1 (0.3) 1 (3.4) PND 1-4
Tail Damaged	0 0	0 0	1 (0.3) 1 (3.4) PND 0-4

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Total Pups (PND 0)	311	339	204
No. pups post cull (PND 4)	237	287	164
Total Litters (PND 0)	28	35	23
No. litters post cull (PND 4)	28	33	22

Pup Clinical Observations PND 0-4

Bruising	1 (0.3)	3 (0.9)	17 (8.3)
Abdomen	1 (3.6)	3 (8.6)	7 (30.4)
	PND 1	PND 0-4	PND 0-4
Bruising	1 (0.3)	1 (0.3)	2 (1.0)
Back	1 (3.6)	1 (2.9)	2 (8.7)
	PND 0	PND 1-3	PND 0-2
Bruising	0	0	1 (0.5)
Chest	0	0	1 (4.3)
			PND 2-4
Bruising	7 (2.3)	3 (0.9)	13 (6.4)
Face	6 (21.4)	3 (8.6)	11 (47.8)
	PND 0-4	PND 0-3	PND 0-4
Bruising	1 (0.3)	1 (0.3)	1 (0.5)
Head	1 (3.6)	1 (2.9)	1 (4.3)
	PND 0-2	PND 0	PND 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Bruising	0	1 (0.3)	0
Left Hind Paw	0	1 (2.9) PND 1	0
Bruising	1 (0.3)	0	0
Neck	1 (3.6) PND 1-2	0	0
Bruising	0	0	1 (0.5)
Right Hind Paw	0	0	1 (4.3) PND 1-2
Bruising	0	0	1 (0.5)
Right Hindlimb	0	0	1 (4.3) PND 1-2
Cold To Touch	6 (1.9) 3 (10.7) PND 0-4	4 (1.2) 1 (2.9) PND 4	2 (1.0) 2 (8.7) PND 1-4
Dehydrated	0	0	1 (0.5)
	0	0	1 (4.3) PND 4
No Milk in Stomach	3 (1.0) 2 (7.1) PND 1-3	3 (0.9) 3 (8.6) PND 1-4	4 (2.0) 4 (17.4) PND 0-4

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Pale	1 (0.3) 1 (3.6) PND 1-4	3 (0.9) 3 (8.6) PND 1-3	17 (8.3) 8 (34.8) PND 0-4
Pup - Found Dead	45 (14.5) 17 (60.7) PND 0-4	38 (11.2) 19 (54.3) PND 0-4	18 (8.8) 11 (47.8) PND 0-3
Pup Cannibalised	4 (1.3) 2 (7.1) PND 0-1	1 (0.3) 1 (2.9) PND 0	0 0
Pup Missing - Presumed Dead	8 (2.6) 6 (21.4) PND 0-3	3 (0.9) 3 (8.6) PND 1-2	21 (10.3) 12 (52.2) PND 0-3
Respiration Audible	0 0	3 (0.9) 1 (2.9) PND 4	0 0
Sore(s) On Body Left Forelimb	0 0	0 0	1 (0.5) 1 (4.3) PND 3-4
Sore(s) On Body Left Hindlimb	0 0	1 (0.3) 1 (2.9) PND 0	0 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Tail Damaged	0	0	1 (0.5)
	0	0	1 (4.3)
			PND 1-4
Pup Clinical Observations PND 5-28			
Abnormal Gait	0	1 (0.3)	0
	0	1 (3.0)	0
		PND 21-28	
Bruising	0	1 (0.3)	0
Abdomen	0	1 (3.0)	0
		PND 5	
Bruising	0	0	1 (0.6)
Back	0	0	1 (4.5)
			PND 6
Bruising	0	0	1 (0.6)
Chest	0	0	1 (4.5)
			PND 5
Bruising	1 (0.4)	0	1 (0.6)
Face	1 (3.6)	0	1 (4.5)
	PND 5		PND 5-9

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
Time Report Requested: 11:18:36
Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Cold To Touch	3 (1.3)	2 (0.7)	0
	3 (10.7)	2 (6.1)	0
	PND 6-10	PND 10-13	
Dehydrated	1 (0.4)	1 (0.3)	2 (1.2)
	1 (3.6)	1 (3.0)	2 (9.1)
	PND 10	PND 11-16	PND 5-7
Emaciated	0	1 (0.3)	0
	0	1 (3.0)	0
		PND 13	
Nasal Discharge Red	2 (0.8)	0	0
	2 (7.1)	0	0
	PND 28		
No Milk in Stomach	10 (4.2)	7 (2.4)	7 (4.3)
	6 (21.4)	6 (18.2)	4 (18.2)
	PND 5-10	PND 7-13	PND 5-10
Pale	0	0	2 (1.2)
	0	0	2 (9.1)
			PND 5-7
Pup - Found Dead	16 (6.8)	14 (4.9)	9 (5.5)
	5 (17.9)	7 (21.2)	7 (31.8)
	PND 5-10	PND 5-13	PND 5-12

Experiment Number: R92025B
Test Type: RACB
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Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

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Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Pup Missing - Presumed Dead	14 (5.9) 8 (28.6) PND 5-17	3 (1.0) 3 (9.1) PND 8-11	8 (4.9) 6 (27.3) PND 6-11
Respiration Audible	1 (0.4) 1 (3.6) PND 17-19	3 (1.0) 1 (3.0) PND 5-11	0 0
Respiration Slow	0 0	1 (0.3) 1 (3.0) PND 7	0 0
Ringtail	1 (0.4) 1 (3.6) PND 15-23	0 0	0 0
Skin Discolored White	0 0	0 0	1 (0.6) 1 (4.5) PND 10
Sore(s) On Body Left Forelimb	0 0	0 0	1 (0.6) 1 (4.5) PND 5-7
Swelling Left Fore Paw	2 (0.8) 1 (3.6) PND 9-24	5 (1.7) 4 (12.1) PND 10-28	0 0

Experiment Number: R92025B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I05P: Pup Clinical Observations Summary
Test Compound: 4-Methylimidazole
CAS Number: 822-36-6

Date Report Requested: 08/25/2017
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Lab: RTI

F2 Pups - Litter C F1 Parental Females

	Treatment Groups (ppm)		
	0	750	2500
Swelling	1 (0.4)	1 (0.3)	0
Left Hind Paw	1 (3.6) PND 16-24	1 (3.0) PND 13-20	0
Swelling	0	0	1 (0.6)
Left Hindlimb	0	0	1 (4.5) PND 10
Swelling	0	3 (1.0)	1 (0.6)
Right Fore Paw	0	2 (6.1) PND 10-21	1 (4.5) PND 7-9
Swelling	0	1 (0.3)	0
Right Hind Paw	0	1 (3.0) PND 13-24	0
Swelling	1 (0.4)	0	0
Right Hindlimb	1 (3.6) PND 10-15	0	0
Tail Damaged	0	0	1 (0.6)
	0	0	1 (4.5) PND 5-11
Tail Tip Missing	0	0	1 (0.6)
	0	0	1 (4.5) PND 12-28

Experiment Number: R92025B
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I05P: Pup Clinical Observations Summary
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LEGEND

Upper row denotes the pup incidence N (%)

Middle row denotes the litter incidence N (%)

Lower row denotes the range of postnatal days the finding was seen for the group

No. live litters includes litters with 1 live pup

Percent incidence calculated using number of live pups or litters on PND 0 (pre cull) or PND 4 (post cull)

PND - Postnatal Day, pups pre-weaning

D Litter is crossover mating of dosed F0 Females with naive F0 Males

E Litter is crossover mating of F0 naive Females with dosed F0 Males (doses listed are for the doses of the F0 Males)

NF = Naive Females

**** END OF REPORT ****