



Wallonie

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To Prof. Marc Coosemans

CERTIFICATE OF ANALYSIS ITM / FO 23005 / Ch.5362 to 5365 / 2012 / A

Samples of : Repellent spray

Declared active substance content : icaridin 20% w/w
Manufacturer : SC Johnson
Batch number : MANF 170212 20 – A1 106018

Repellent spray

Declared active substance content : icaridin 20% w/w
Manufacturer : SC Johnson
Batch number : MANF 160212 03 – A1 005913

Repellent lotion

Declared active substance content : icaridin 10% w/w
Manufacturer : SC Johnson
Batch number : MANF 220212 70 – C1 074256

Repellent lotion

Declared active substance content : icaridin 10% w/w
Manufacturer : SC Johnson
Batch number : MANF 210212 76 – C1 039490

Supplier : Institute of Tropical Medicine Antwerp.

Arrived on : July 30, 2012.

Type of package : plastic flask of 100 mL.

Reference : Request of July 27, 2012 from Prof. Marc Coosemans (Institute of Tropical Medicine Antwerp).

RESULTS :

1. Icaridin content

[CIPAC method 740/TC/(M)/3, CIPAC Handbook K, p.65, Gas Chromatography with Flame Ionization Detection (GC-FID)].

Dates of analysis : from November 21 until November 22, 2012.

Repellent spray - Batch MANF 170212 20 – A1 106018

WHO general specification limit : 20% w/w \pm 6% [18.8 – 21.2 % w/w]

Determination	Icaridin content (% w/w)
1	19.94
2	20.02
3	19.88
Mean	19.95
Standard deviation	0.07
Relative standard deviation (RSD) *	0.35 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	19.95 \pm 0.17

* RSD < RSD Horwitz x 0.67 (1.71 %).

Repellent spray - Batch MANF 160212 03 – A1 005913

WHO general specification limit : 20% w/w \pm 6% [18.8 – 21.2 % w/w]

Determination	Icaridin content (% w/w)
1	19.95
2	20.19
3	19.67
Mean	19.94
Standard deviation	0.26
Relative standard deviation (RSD) *	1.30 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	19.94 \pm 0.65

* RSD < RSD Horwitz x 0.67 (1.71 %).

Repellent lotion - Batch MANF 220212 70 – C1 074256WHO general specification limit : 10% w/w \pm 10% [9.0 – 10.0 % w/w]

Determination	Icaridin content (% w/w)
1	9.08
2	9.20
3	9.07
Mean	9.12
Standard deviation	0.07
Relative standard deviation (RSD) *	0.77 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	9.12 \pm 0.17

* RSD < RSD Horwitz x 0.67 (1.92 %).

Repellent lotion - Batch MANF 210212 76 – C1 039490WHO general specification limit : 10% w/w \pm 10% [9.0 – 10.0 % w/w]

Determination	Icaridin content (% w/w)
1	9.75
2	9.77
3	9.78
Mean	9.77
Standard deviation	0.02
Relative standard deviation (RSD) *	0.20 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	9.77 \pm 0.05

* RSD < RSD Horwitz x 0.67 (1.90 %).

2. Impurity sec-butyl chlorformate content

[Method developed by the test facility and based on CIPAC method 740/TC/(M)/3, CIPAC Handbook K, p.65, and Gas Chromatography with Mass Spectrometry Detection (GC-MS)].

Dates of analysis : from November 21 until December 01, 2012.

Repellent spray - Batch MANF 170212 20 – A1 106018

Determination	sec-butyl chlorformate content	
	g/kg	g/kg of the icaridin content
1	ND	ND
2	ND	ND
3	ND	ND
Mean	ND	ND
Standard deviation	-	-
Relative standard deviation (RSD)	-	-
Confidence interval of the mean (Student T-test with a probability of 95 %)	-	-

ND = not detected (limit of quantification = 0.005 g/kg or 0.025 g/kg of the icaridin content).

Repellent spray - Batch MANF 160212 03 – A1 005913

Determination	sec-butyl chlorformate content	
	g/kg	g/kg of the icaridin content
1	ND	ND
2	ND	ND
3	ND	ND
Mean	ND	ND
Standard deviation	-	-
Relative standard deviation (RSD)	-	-
Confidence interval of the mean (Student T-test with a probability of 95 %)	-	-

ND = not detected (limit of quantification = 0.005 g/kg or 0.025 g/kg of the icaridin content).

Repellent lotion - Batch MANF 220212 70 – C1 074256

Determination	sec-butyl chlorformate content	
	g/kg	g/kg of the icaridin content **
1	0.008	0.084
2	0.008	0.086
3	0.008	0.087
Mean	0.008	0.086
Standard deviation	0.000	0.002
Relative standard deviation (RSD) *	0.00 %	1.78 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.008 ± 0.000	0.086 ± 0.001

* RSD < RSD Horwitz x 0.67 (5.54 %).

** Using the result obtained for icaridin content.

Repellent lotion - Batch MANF 210212 76 – C1 039490

Determination	sec-butyl chlorformate content	
	g/kg	g/kg of the icaridin content **
1	0.007	0.070
2	0.007	0.072
3	0.007	0.073
Mean	0.007	0.072
Standard deviation	0.000	0.002
Relative standard deviation (RSD) *	0.00 %	2.13 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.007 ± 0.000	0.072 ± 0.004

* RSD < RSD Horwitz x 0.67 (5.66 %).

** Using the result obtained for icaridin content.

3. Impurity sec-butyl carbonic anhydride content

[Method developed by the test facility and based on CIPAC method 740/TC/(M)/3, CIPAC Handbook K, p.65, and Gas Chromatography with Mass Spectrometry Detection (GC-MS)].

Dates of analysis : from November 21 until December 01, 2012.

Repellent spray - Batch MANF 170212 20 – A1 106018

Determination	sec-butyl carbonic anhydride content	
	g/kg	g/kg of the icaridin content **
1	0.180	0.904
2	0.182	0.915
3	0.187	0.937
Mean	0.183	0.919
Standard deviation	0.004	0.017
Relative standard deviation (RSD) *	1.97 %	1.83 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.183 ± 0.009	0.919 ± 0.042

* RSD < RSD Horwitz x 0.67 (3.46 %).

** Using the result obtained for icaridin content.

Repellent spray - Batch MANF 160212 03 – A1 005913

Determination	sec-butyl carbonic anhydride content	
	g/kg	g/kg of the icaridin content **
1	0.184	0.921
2	0.182	0.912
3	0.177	0.890
Mean	0.181	0.908
Standard deviation	0.004	0.016
Relative standard deviation (RSD) *	1.99 %	1.76 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.181 ± 0.009	0.908 ± 0.040

* RSD < RSD Horwitz x 0.67 (3.47 %).

** Using the result obtained for icaridin content.

Repellent lotion - Batch MANF 220212 70 – C1 074256

Determination	sec-butyl carbonic anhydride content	
	g/kg	g/kg of the icaridin content **
1	0.092	1.008
2	0.096	1.055
3	0.092	1.005
Mean	0.093	1.023
Standard deviation	0.002	0.028
Relative standard deviation (RSD) *	2.47 %	2.74 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.093 ± 0.006	1.023 ± 0.070

* RSD < RSD Horwitz x 0.67 (3.83 %).

** Using the result obtained for icaridin content.

Repellent lotion - Batch MANF 210212 76 – C1 039490

Determination	sec-butyl carbonic anhydride content	
	g/kg	g/kg of the icaridin content **
1	0.099	1.016
2	0.103	1.058
3	0.099	1.009
Mean	0.100	1.028
Standard deviation	0.002	0.027
Relative standard deviation (RSD) *	2.30 %	2.58 %
Confidence interval of the mean (Student T-test with a probability of 95 %)	0.100 ± 0.006	1.028 ± 0.066

* RSD < RSD Horwitz x 0.67 (3.79 %).

** Using the result obtained for icaridin content.



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