UKAS Laboratory Testing Services

EMISSIONS ANALYSIS

Date of Receipt:	Date of Report: 23.11.16	Report No: ALO010343 KIJ007
Customer:- **ADACT MEDICAL**		
The Old Rectory, Wroot, DN9 2BU		
Test Report Serial Number	KIND JUICE-SWEET CAROLINA	
Sample /Batch Number:-		
Sample Date:-		
Location:-		
Approved X CHEIF REGULATORY OFFICER	comments	

AdAct Medical Ltd
The Old Rectory
Wroot DN9 2BU

Background

E-Liquid made to a % Nicotine level or mg Nicotine levels as part of their due diligence to confirm the components currently found within the Nicotine Solution formulation.

Solutions of this type can be used in an electronic cigarette which replicates the action of smoking, producing a tobacco aromatized smoke, which when inhaled quickly delivers the nicotine to the lung.

The Electronic Cigarette does not emit a tarry smoke, or produce an ash deposit, and can be used to wean the smoker off 'cigarette smoking' in a controlled manner.

1. Description of Vapour Analysis

One Sample **(KIJ007**) was received for analysis. The vapour was generated on a E-Cigarette, single 70ml puff,2.5 seconds taken to generate vapour, vapour trapped in a glass thermal desorption syringe/tubes for GC/FID, GC/MS analysis. The sample was tested using AL-BIOSERVICES in house developed method for qualitative determination of

Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl) (flavouring),

Propylene Oxide (produced when propylene glycol is heated)

Acrolein (produced when glycerine is heated), Formaldehyde(degradation of PG),Acetaldehyde(degradation of PG) within an vapour The sample was labelled as: - 20ML SAMPLE FOR GC **KIJ007**

2. GC/MS Method

The sample was analysed by AL-BIOSERVICES to determine the Nicotine, Propylene Glycol, Glycerine, Diethylene
Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl)
(flavouring),Propylene Oxide (produced when propylene glycol is heated),Acrolein (produced when glycerine is heated), Formaldehyde (degradation of PG),Acetaldehyde(degradation of PG) present by GC/MS. Column: Capillary
Column Temperature:
Analysis Time: 20 min
Carrier gas: Helium
Injection Vol: 2µl
Injection: Split injection ratio 50:1, temp 250oC
Detection:

3. The Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione acetyl propronyl) (flavouring),Propylene Oxide

(produced when propylene glycol is heated) Acrolein (produced when glycerine is heated), Formaldehyde(degradation of PG),Acetaldehyde(degradation of PG) Assay

a. Sample Extraction for GC Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl) (flavouring),
Propylene Oxide (produced when propylene glycol is heated)
Acrolein (produced when glycerine is heated), Formaldehyde(degradation of PG),Acetaldehyde(degradation of PG)

b. Calibration of GC Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl) (flavouring),
Propylene Oxide (produced when propylene glycol is heated)
Acrolein (produced when glycerine is heated), Formaldehyde (degradation of PG),Acetaldehyde(degradation of PG) standards was obtained from Sigma-Aldrich in methanol.

4. GC/MS Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl) (flavouring), Propylene Oxide (produced when propylene glycol is heated).

Acrolein (produced when glycerine is heated), Formaldehyde(degradation of PG),Acetaldehyde(degradation of PG) assay Method
The standards were analysed at AL-BIOSERVICES to determine the Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin {flavouring),Diacetyl (flavouring),2.3.Pentanedione ,(acetyl propionyl) (flavouring),Propylene Oxide (produced when propylene glycol is heated) Acrolein (produced when glycerine is heated), Formaldehyde (degradation of PG),Acetaldehyde (degradation of PG)concentration present by GC (Gas Chromatography).

The syringe used for injecting the samples was cleaned between samples using a solvent.
Each 'unknown' sample is analysed by injecting an identical volume onto the GC system (0.5 µl as when calibrating) and the integrated peak area is used to calculate the nicotine content of the standards and then the samples and by adding the detector response factor and the dilution factor to the integrated peak area for nicotine. The nicotine concentration can be expressed directly in units as follows: -

• mg/ ml for liquid supplied in bottles and % Nicotine

Description of Vapour Generation
One Sample (**KIJ007)** received for analysis. The vapour was generated on a E-Cigarette(ELEAF),5 X 70ml puff generated at 4.3V(warming up), a single 70ml puff at 4.3V 2.5 seconds duration per puff, vapour trapped in a glass thermal desorption syringe/tubes for GC analysis. The emissions sample was tested using AL-BIOSERVICES in house developed method for qualitative determination using GC methodology
The sample was labelled as: - 30ML SAMPLE FOR **KIJ007**

5. Results
Samples was tested as specified in AL-BIOSERVICES in house GC method for the analysis of E-liquid Vapour, and the results obtained are tabulated in Table 1.
LOD 0.01%

Table 1

SAMPLE NAME **KIJ007**	TEST % Test Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin{flavouring),Diacetyl 2.3.Pentanedione ,(Acetyl Propionyl) Propylene Oxide, Acrolein, Formaldehyde, Acetaldehyde GC determination. Against Nicotine, Propylene Glycol, Glycerine, Diethylene Glycol, Ethylene Glycol, Acetone, Acetoin,Diacetyl 2.3.Pentanedione ,(Acetyl Propionyl) Propylene Oxide, Acrolein, Formaldehyde, Acetaldehyde Standards	RESULTS	
		1 x 70ml	5 x 70ml
	Nicotine	1.33	
	Propylene Glycol		
	Glycerine		
	Diethylene Glycol	N.D	
	Ethylene Glycol	N.D	
	Acetone	N.D	

	Acetoin{flavouring)	N.D	
	Diacetyl (flavouring)	N.D	
	2.3.Pentanedione (acetyl propionyl) (flavouring)	N.D	
	Propylene Oxide (produced when propylene glycol is heated)	N.D	
	Acrolein (produced when glycerine is heated)	N.D	
	Formaldehyde(degradation of PG)	N.D	
	Acetaldehyde(degradation of PG)	N.D	
	Benzene	N.D	
	Toulene	N.D	
	Water	0.001%	

Every care is taken in the preparation of this report, it is given on the understanding that we accept no liability for any error or omission