

Appendix

A1- Quality certificate of diesel used in oxygenated study

CALTEX REFINERIES

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Quality Certificate Automotive Diesel -Xtra Low Sulfur



CALTEX

Date : 29-04-2017

Tank : D2067

Batch No: DX1568

Product Code: DXLQS

METHOD	TEST	SPECIFICATION		RESULT	UNITS
ASTM D4176	Appearance @ 25°C	1	max	1	
ASTM D4737A	Cetane Index (Calculated)	46	min	54.0	
ASTM D5773	Cloud Point (D2500 equivalent)	0	max	0	deg C
ASTM D1500	Colour (ASTM)	2.0	max	L1.0	
ASTM D2624	Conductivity	80-600		455	pS/m
ASTM D2624	Temperature at time of measurement	Report		22.1	deg C
ASTM D130	Copper Corrosion (3 Hrs @ 50 deg C)	1	max	1a	
ASTM D4052	Density @ 15 deg C	0.820-0.850		0.8379	kg/L
ASTM D86	10% Recovered	Report		230.0	deg C
ASTM D86	50% Recovered	Report		273.0	deg C
ASTM D86	90% Recovered	Report		325.5	deg C
ASTM D86	95% Recovered	360	max	339.6	deg C
ASTM D86	FBP	Report		354.4	deg C
IP 387	Filter Blocking Tendency	1.41	max	1.01	
ASTM D93	Flash point	64.0	min	75.5	deg C
IP 450	Lubricity (wsd 1.4) @ 60°C	0.460	max	0.423	mm
Declaration	Lubricity Additive - Tolad 9121	Report		104	mg/kg
Declaration	Total Lubricity Additive content	300	max	104	mg/kg
ASTM D6591	Aromatics	15	min	28.7	mass%
ASTM D6591	Polyaromatic Hydrocarbons	11.0	max	5.7	mass%
Calculated	Stadis 450 (RDE/A621) content	7	max	1.2	mg/L
ASTM D7039	Sulfur (Total)	10	max	7.3	mg/kg
ASTM D2709	Water and Sediment	0.05	max	<0.01	vol%
Declaration	Additives (other)	Report		Nil Addition	mg/L
ASTM D974	Acid Number (Total)	0.30	max	<0.30	mg KOH/g
ASTM D482	Ash	100	max	<100	mg/kg
ASTM D4530	Carbon Residue (10 % Bottoms)	0.20	max	<0.2	mass%
ASTM D445	Viscosity @ 40 deg C	2.0 - 4.5		2.0 to 4.5	sq.mm/sec
ASTM D974	Acid Number (Strong)	nil		Nil	mg KOH/g
ASTM D2274	Oxidation Stability	25	max	<25	mg/L

* Based on frequency testing

Denotes result off specification

Note 1:- Nil Bio-Diesel (FAME) has been added to this product

This fuel conforms to Australian National Fuel Standards for 2001.

All tests have been performed with the latest revision of the tests indicated. The accuracy of the test results is within the limits of precision shown in the methods.

This certificate relates specifically to the sample tested, but relates also to the entire batch in so far as the sample is drawn according to ASTM D4057.

Date testing completed : 29-04-2017

Approved Signatory :

Name :

Date : 29-04-2017

ID : 705471

A2- GC-MS of essential oils used in oxygenated studies

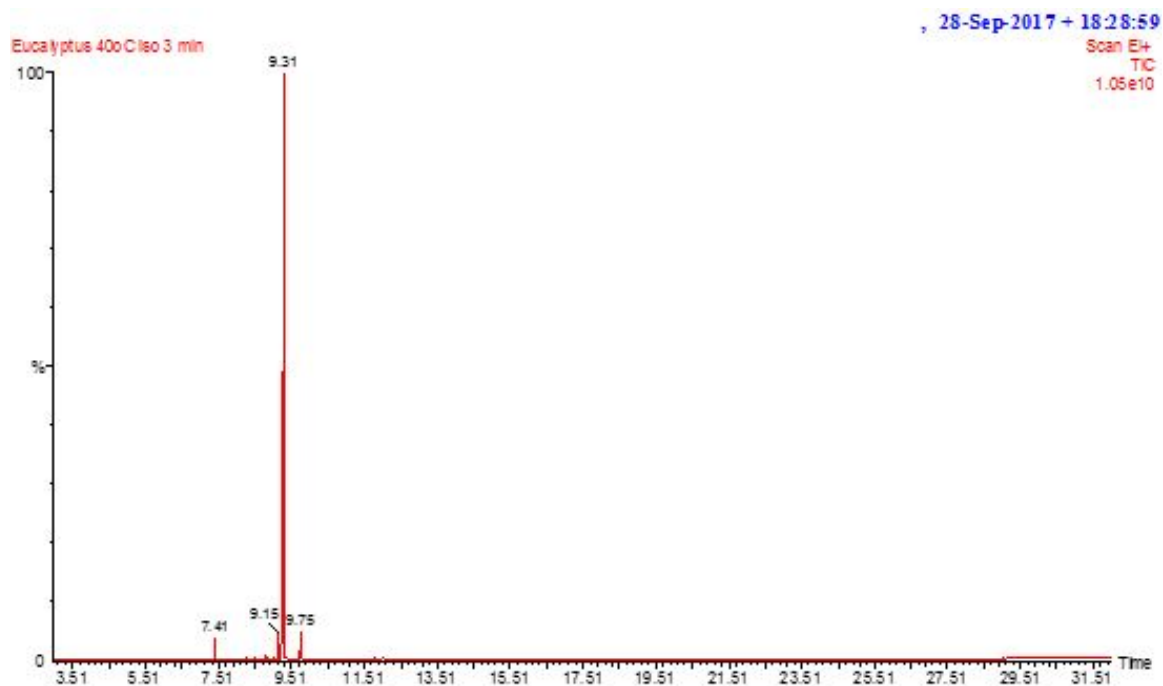


Figure A-1: GC-MS of pure eucalyptus oil-

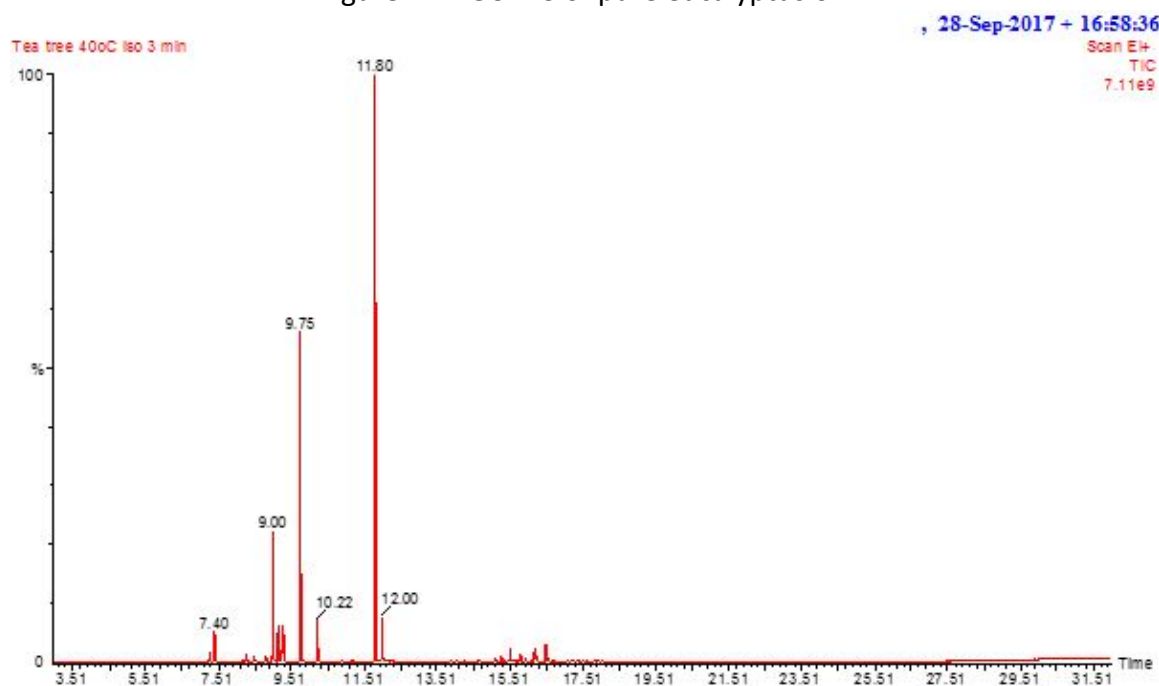


Figure A-2: GC-MS of pure tea tree oil