

SCAQMD M313-91

VOC by GC/MS/FID

Preview

June 20th, 2013

SCAQMD M313-91

A GC/MS/FID method with a **regulatory focus** for use on paints, coatings and solvents that are below 150 g/L VOC Material as measured with M24.

Use in place of M24 for AQMD SIP rules and voluntary programs only.

SCAQMD M313-91



Method history and improvements

Comparison to ASTM D6886

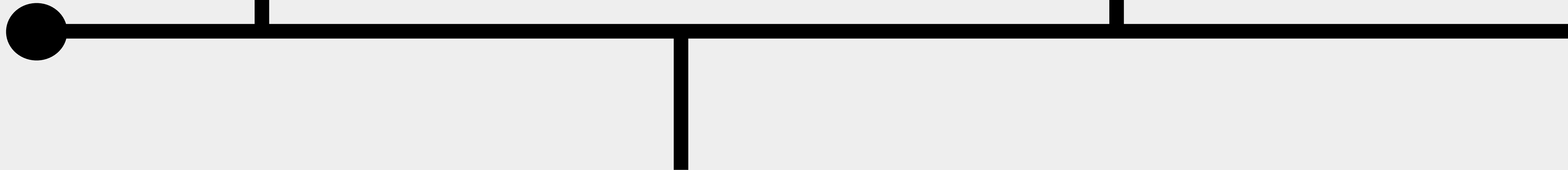
Endpoint and exclusions

Early Years

M313-91 completed
(1991)

Instrument fails; dilutions and
methyl palmitate endpoint
(~1996)

CAS program begins:
liquid injections
(~1994)



Later Years

Improve consistency;
discrimination+

RI 113 for paints and coatings;
extraction markers and
default compound

Approached
regulatory agencies
(Fall 2012)

Recent History

Addition of
“target” compound mix
(December 2012)

Lowered calibration
range {0.1 - 15 g/L}
(March 2013)

“Surrogate” range
limited to 1-2 g/L
(February 2013)

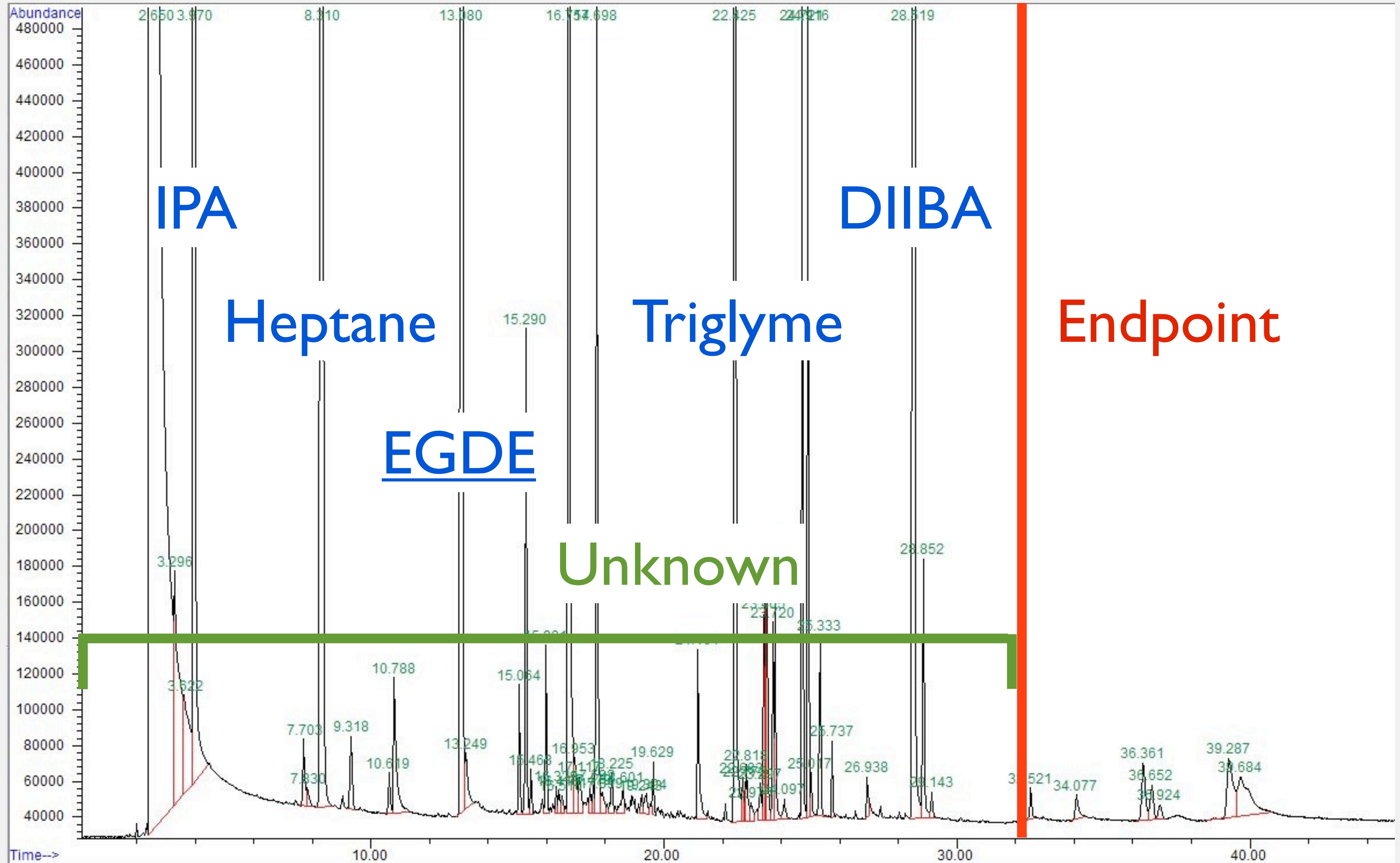
Meet with
industry
(Today)

Extraction Markers

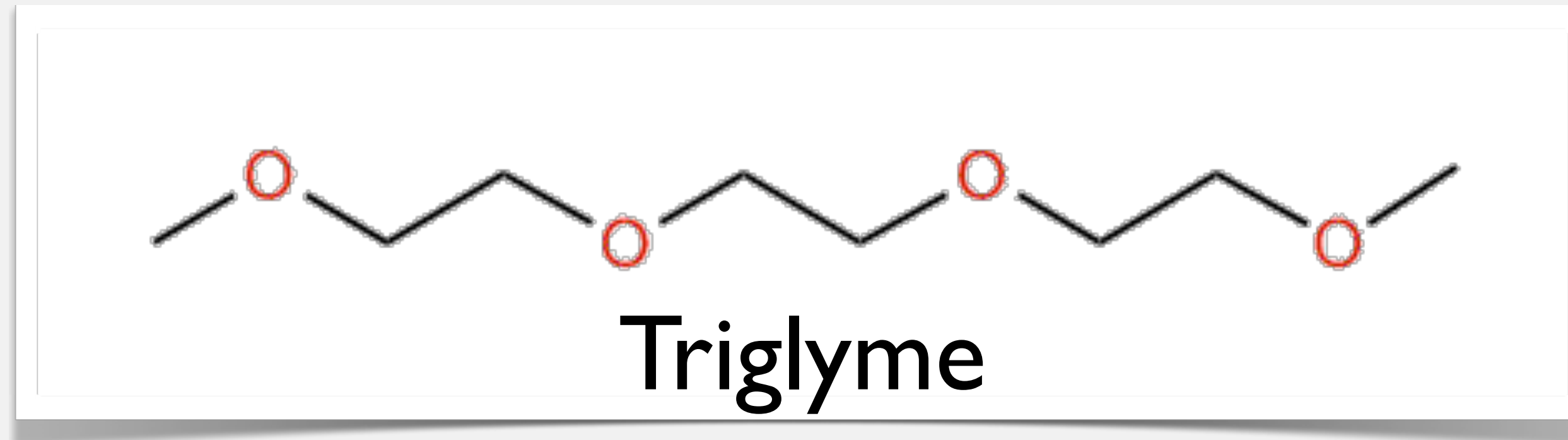
Compound	Characteristic	Retention	Functional Group
IPA	Small, Polar	Early	Alcohol
Heptane	Small, Non-Polar	Early-Mid	Alkane
Triglyme	Large, Polar	Mid-Late	Poly-ether
DIIBA	Large, Non-Polar	Late	Ester

Also: ethylene glycol diethyl ether internal standard

Extraction Markers



Default Compound

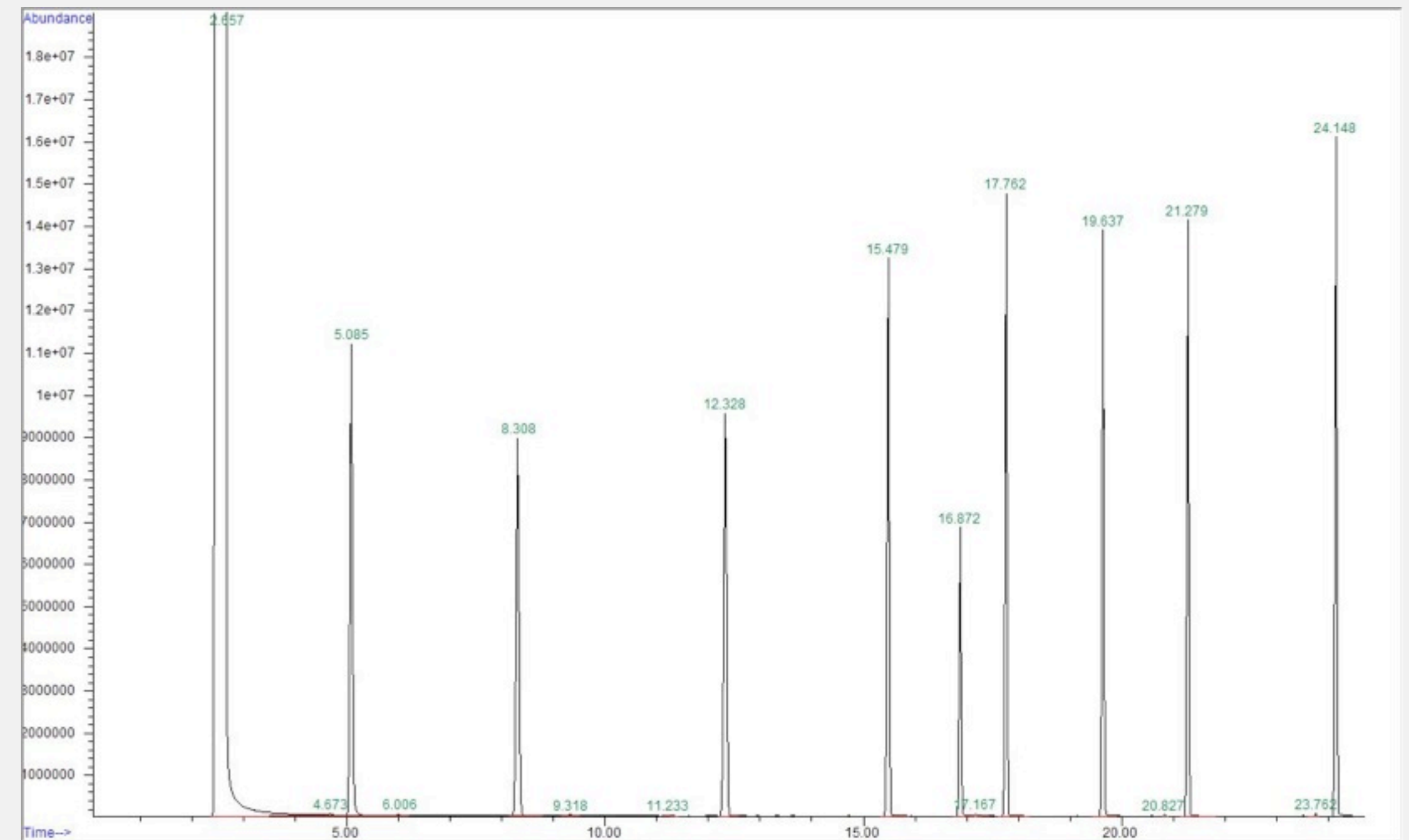


Used to: “Screen” peaks for necessity of identification

Represent concentration of all peaks below
1 g/L threshold (up to a total of 5 g/L)

Discrimination+ Standard

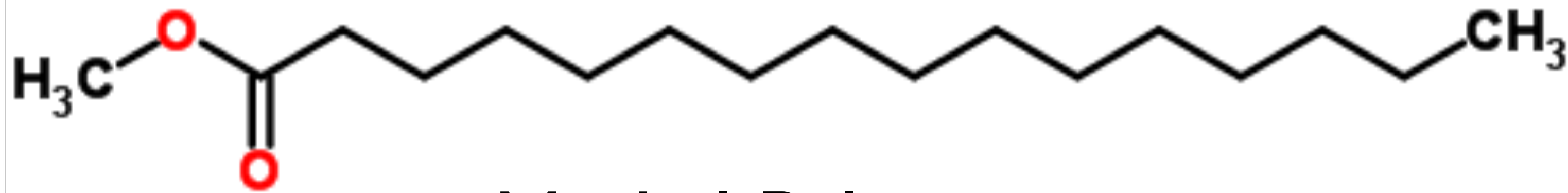
Component	Checks for
C6 - C15	Discrimination
BFB	Fragmentation
Methyl Palmitate	Endpoint
Ethylene Glycol	Resolution
Propylene Glycol	Resolution
Triglyme (0.1 g/L)	LOD



Comparison to ASTM D6886

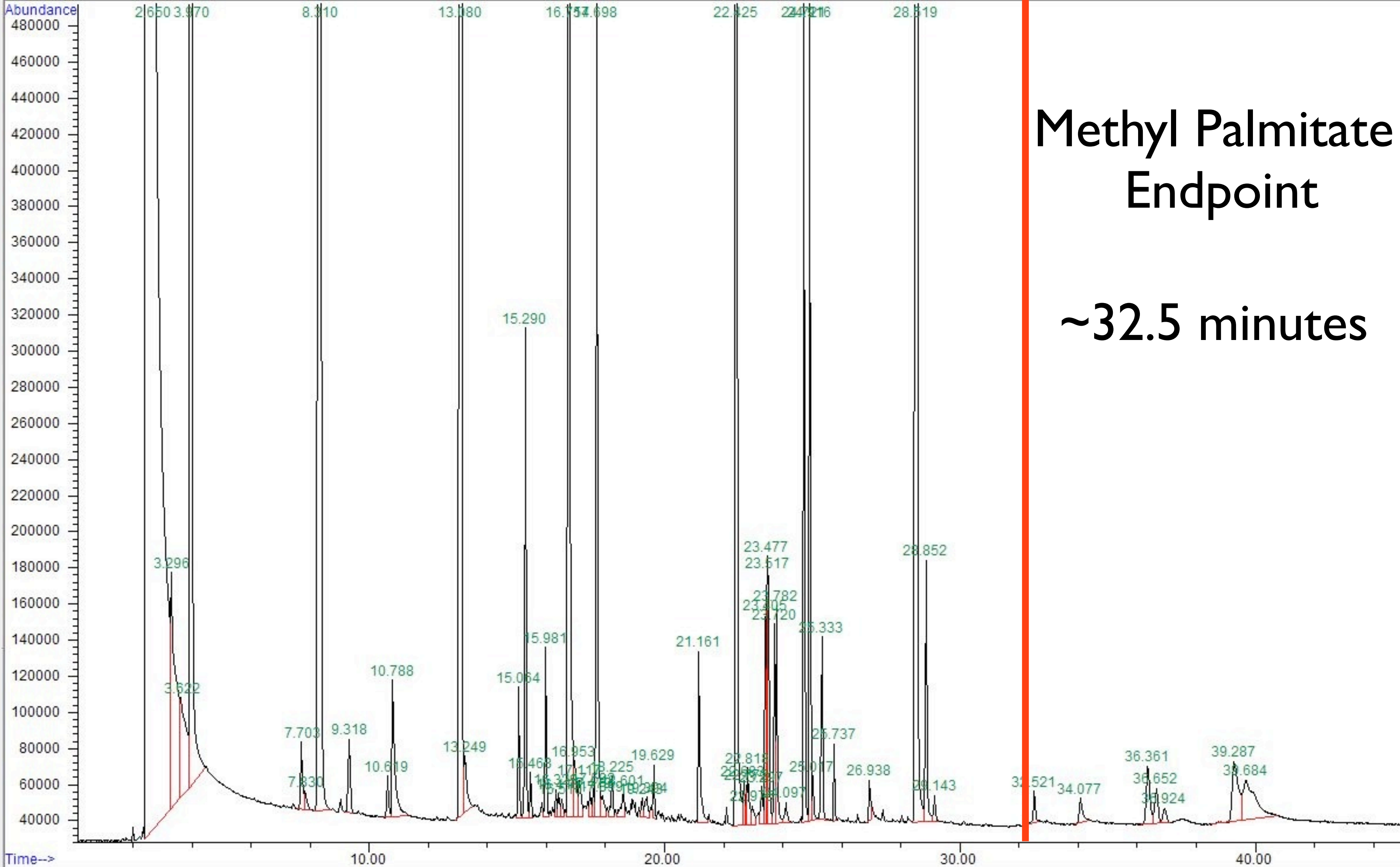
	Quality Control	Default Compound	Endpoint Marker
ASTM D6886	Duplicates & Calibration	Texanol	20 minutes
SCAQMD M313-91	6886 QC, Extraction Markers, Discrimination+ & Target Check	Triglyme	Methyl Palmitate (6886 @ 18.4 min)

Endpoint

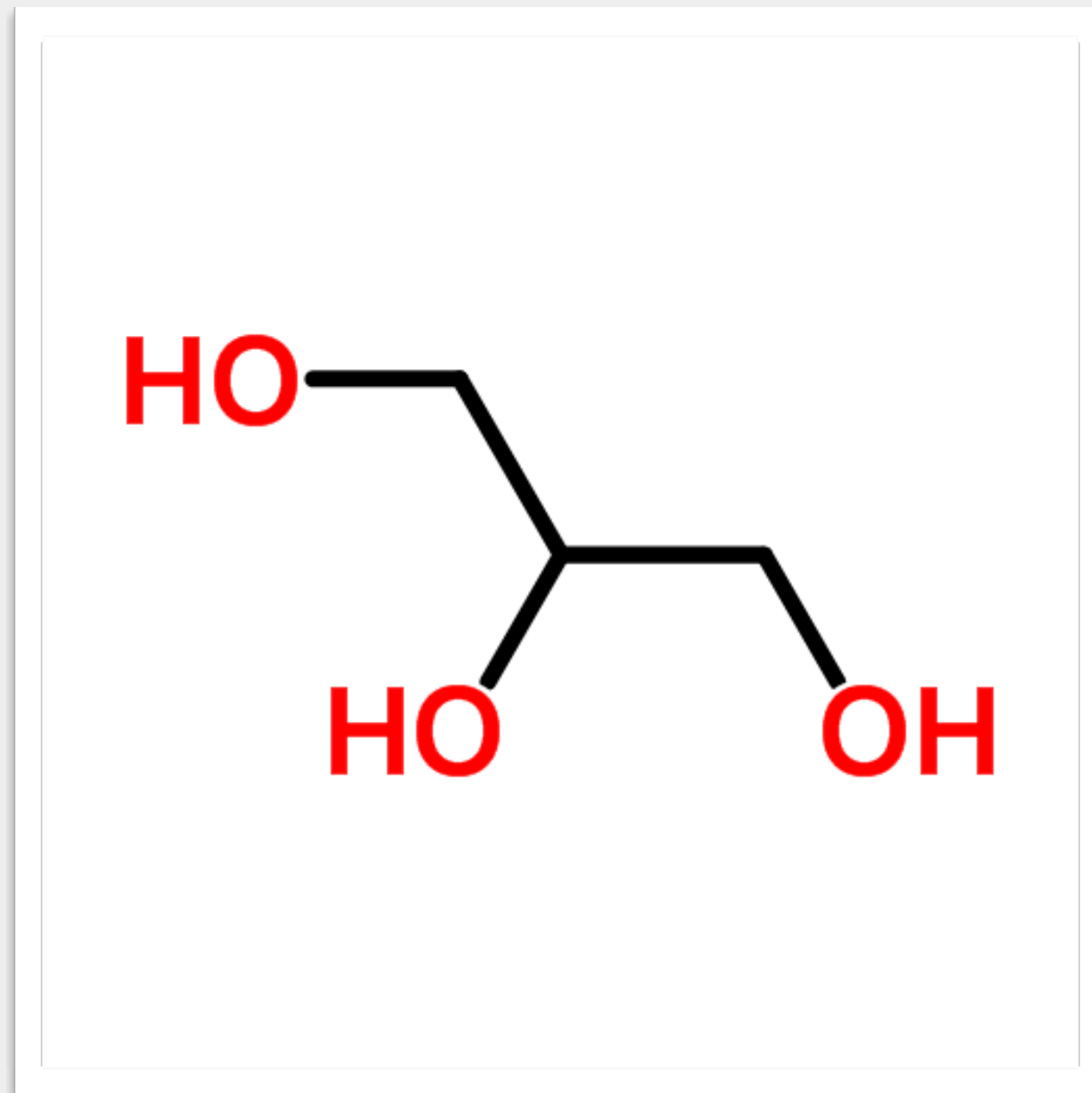


Methyl Palmitate

Endpoint



Early Eluting Non-Volatile



Glycerin

	Retention Time
Glycerin	~26 min
Methyl Palmitate	~32 min

Early Eluting Non-Volatile

		Glycerin	Methyl Palmitate	Conditions
Boiling Point (°C)		290	332	1: 110 °C 60 minutes
Vapor Pressure (mm Hg)		< 0.001	< 0.001	2: 81 °C 110 minutes
% NV	¹ M24	85	60	3: 24 °C 41% humidity 6 months (average)
	² TGA	96	96	
	³ Ambient	131	99	

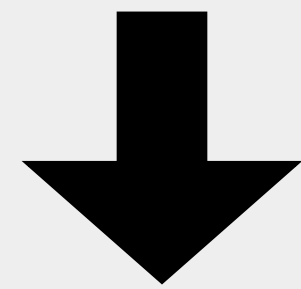
Early Eluting Non-Volatile

How do EENVs test out of the “volatile” classification?

Next Steps

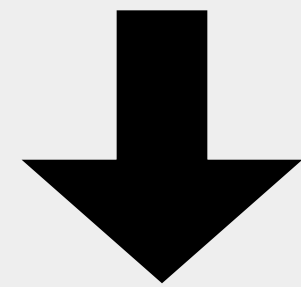
Send out latest revision of written method

August



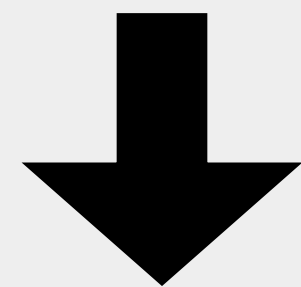
Gather comments on method from industry

mid-August



Meet with industry

September



Complete approval process



Questions and Comments

M313 Test Methodology

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