

# Measuring VOCs on a 20 m Rxi-1ms Module

## Using Micro GC Fusion

### Introduction

The following datasheet provides a retention time order and potential coelution issues for common volatile organic compounds (VOCs) and hydrocarbons using a 20 m Rxi-1ms non-polar column module.

### Starting Parameters

These parameters can be used as a starting point for creating a method and can be adjusted to optimize specific separations. Exact retention times vary from GC to GC, but the compound order remains the same. Some components cannot be separated using this non-polar phase and are indicated in the table.

Method Parameter	Module A - 20 m Rxi-1ms, Large Variable Volume Injector (GCMR-U43)
Inject time	60 ms
Injector temperature	90°C
Column pressure	32 psi, 99.999% helium
Data rate	25 Hz
Temperature ramp	50°C (90 s) --> 200°C (60 s), 0.6°C/s
Sample pump time	15 s
Sample inlet temperature	90°C

### Retention Time Order

Compound	Retention Time (s)	Relative Retention Time to n-Hexane	Coelution
Air/composite	67.08	0.30	Fixed gases and methane coelute
CO <sub>2</sub>	70.56	0.31	Not fully separated from ethylene/acetylene, depending on concentration
ethylene	72.04	0.32	Coelutes with acetylene
acetylene	72.04	0.32	Coelutes with ethylene
ethane	73.60	0.33	N/A
ammonia	76.52	0.34	Elutes on the tail of ethane
hydrogen sulfide	79.08	0.35	N/A
formaldehyde	80.51	0.36	N/A
propylene	85.44	0.38	Partial coelution with propane/water/COS
water	86.16	0.38	Coelutes with propane
propane	86.16	0.38	Coelutes with water
carbonyl sulfide (COS)	86.72	0.38	Coelutes with propane and water
acetaldehyde	86.76	0.38	Coelutes with water
dimethyl ether	97.68	0.42	N/A

Compound	Retention Time (s)	Relative Retention Time to n-Hexane	Coelution
isobutane	104.32	0.46	Coelutes with methanol
methanol	105.68	0.47	Rides on the tail of a large water/propane peak; coelutes with isobutane
1-butene	114.04	0.51	Coelutes with isobutylene
isobutylene	114.04	0.51	Coelutes with 1-butene
1,3-butadiene	115.64	0.51	N/A
n-butane	117.72	0.52	N/A
trans-2-butene	122.16	0.54	N/A
cis-2-butene	128.80	0.57	N/A
ethanol	137.04	0.61	N/A
acetonitrile	145.42	0.64	N/A
isopentane	154.56	0.69	Coelutes with acetone
acetone	155.32	0.69	Coelutes with isopentane
isopropanol	160.20	0.71	Partial co-elution with 1-pentene
1-pentene	162.28	0.72	Partial co-elution with isopropanol
n-pentane	168.40	0.75	N/A
trans-2-pentene	172.16	0.76	N/A
cis-2-pentene	176.00	0.78	N/A
methylene chloride	179.28	0.80	Coelutes with 2-m-2-butene
2-m-2-butene	179.80	0.80	Coelutes with methylene chloride
MEK (2-butanone)	214.96	0.95	N/A
ethyl acetate	225.12	1.0	Coelutes with n-hexane
n-hexane	225.56	1.0	Coelutes with ethyl acetate
chloroform	229.32	1.02	N/A
tetrahydrofuran	240.60	1.07	N/A
butanol	252.72	1.12	N/A
benzene	259.36	1.15	N/A
2-methyl tetrahydrofuran	263.92	1.17	N/A
1,4-dioxane	278.92	1.24	Coelutes with n-heptane
n-heptane	279.04	1.24	Coelutes with 1,4-dioxane
MIBK (4-methyl-2-pentanone)	293.48	1.30	N/A
toluene	314.08	1.39	N/A
ethyl benzene	359.64	1.59	N/A
p-xylene	363.20	1.61	Coelutes with m-xylene
m-xylene	363.20	1.61	Coelutes with p-xylene
o-xylene	373.36	1.66	N/A
styrene	373.60	1.66	Coelutes with o-xylene

## Example Chromatograms

The following chromatograms are example runs of common VOCs and hydrocarbons.

