

Supplementary Information

for

MoO₃-Based Photocatalysts for the Depolymerization of Lignin Under UV-Vis Light

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Table of Contents

1. GC-MS traces for bio-oil samples	P. 1
2. List of compounds identified in KL depolymerization bio-oil	P. 3
3. Mass spectra of identified products in bio-oil samples	P. 4

1. GC-MS traces for bio-oil samples

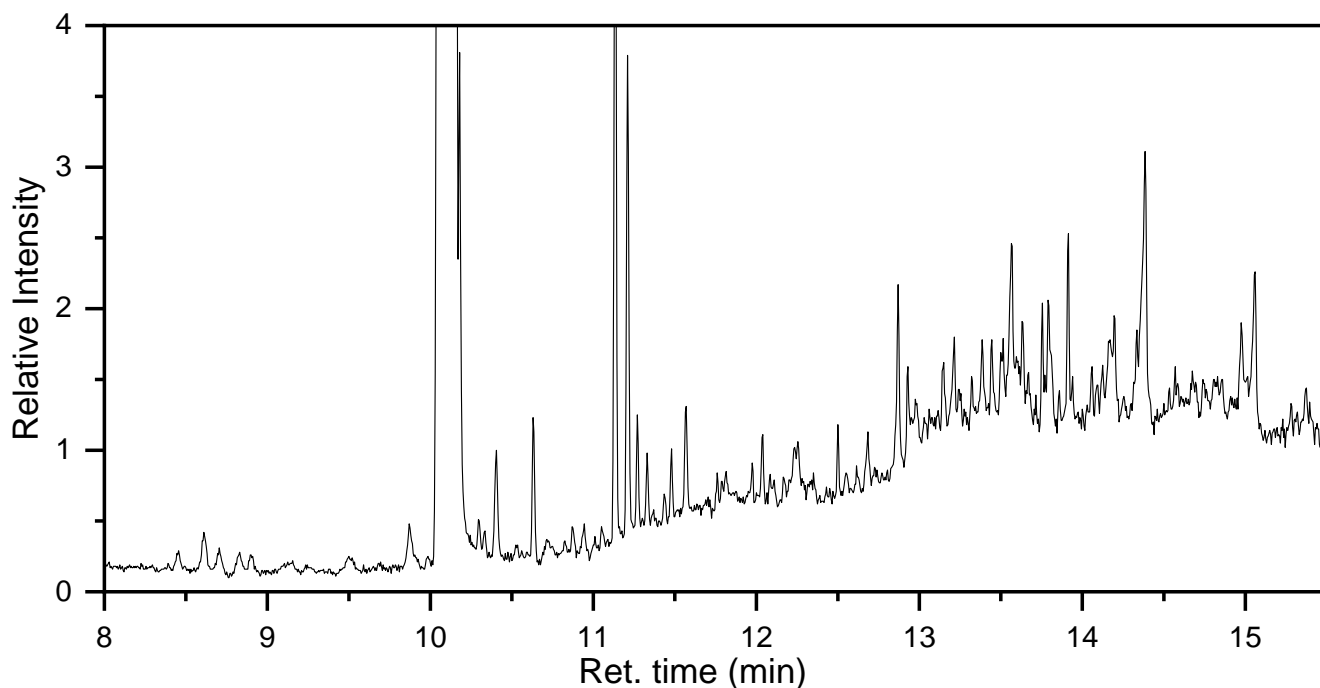


Figure S1. GC-MS trace of bio-oil obtained from photocatalytic depolymerization of WSL catalyzed by MoO_3 (Conditions: UV-vis irradiation, solvent 0.01 M aqueous NaOH, WSL 200 ppm, MoO_3 1 g/L, rt, 5 h). * IS impurities.

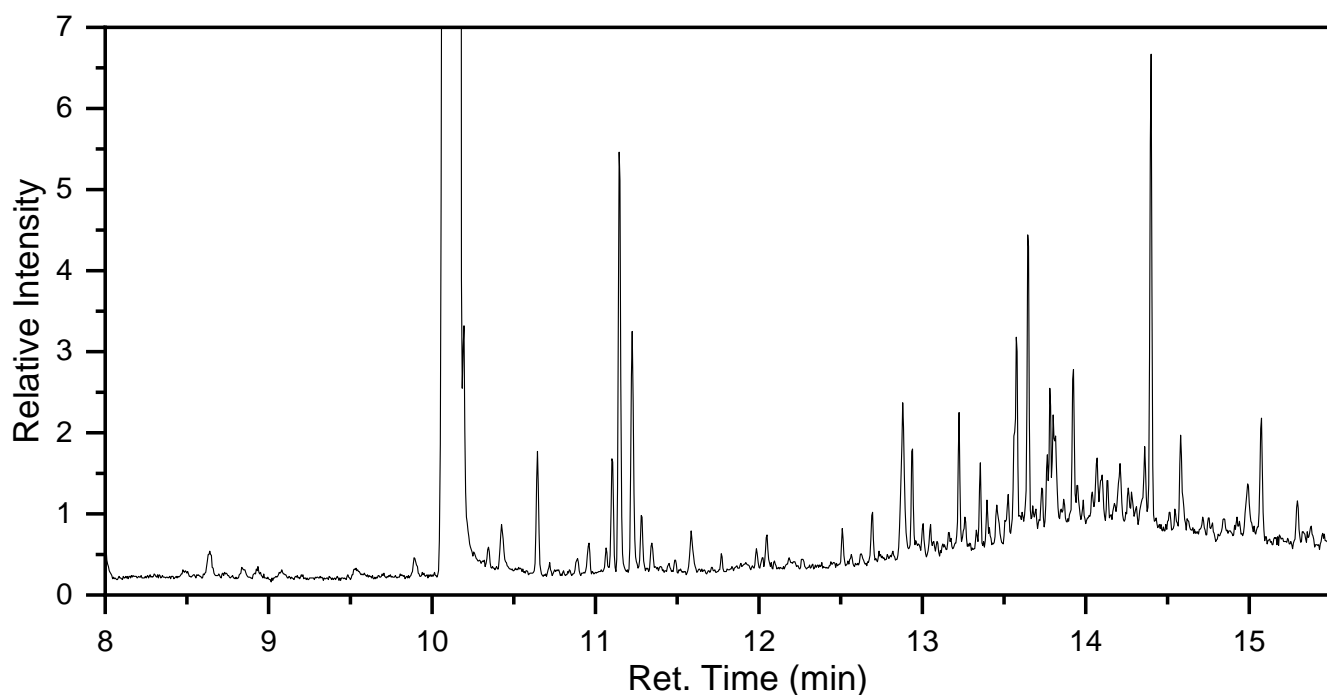


Figure S2. GC-MS trace of bio-oil obtained from photocatalytic depolymerization of WSL catalyzed by Cu-MoO_3 (Conditions: UV-vis irradiation, solvent 0.01 M aqueous NaOH, WSL 200 ppm, Cu-MoO_3 1 g/L, rt, 5 h). * IS impurities.

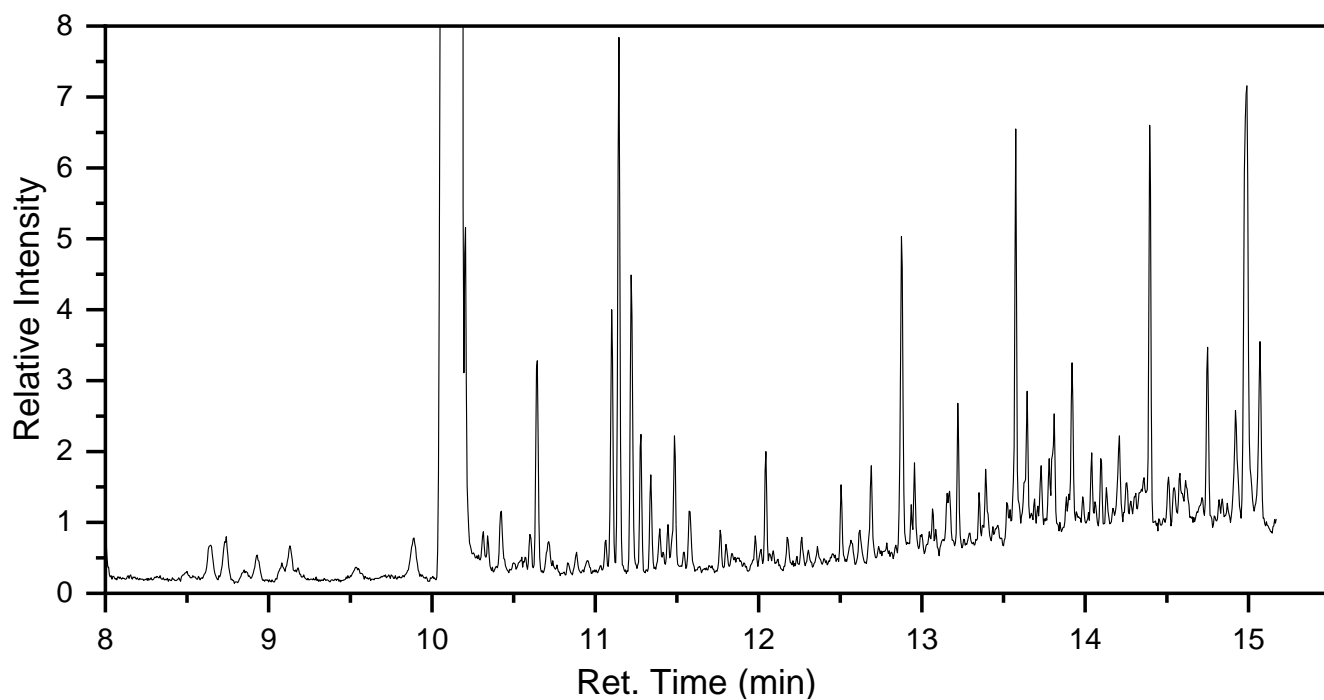


Figure S3. GC-MS trace of bio-oil obtained from photocatalytic depolymerization of WSL catalyzed by H-MoO₃ (Conditions: UV-vis irradiation, solvent 0.01 M aqueous NaOH, WSL 200 ppm, H-MoO₃ 1 g/L, rt, 5 h). * IS impurities.

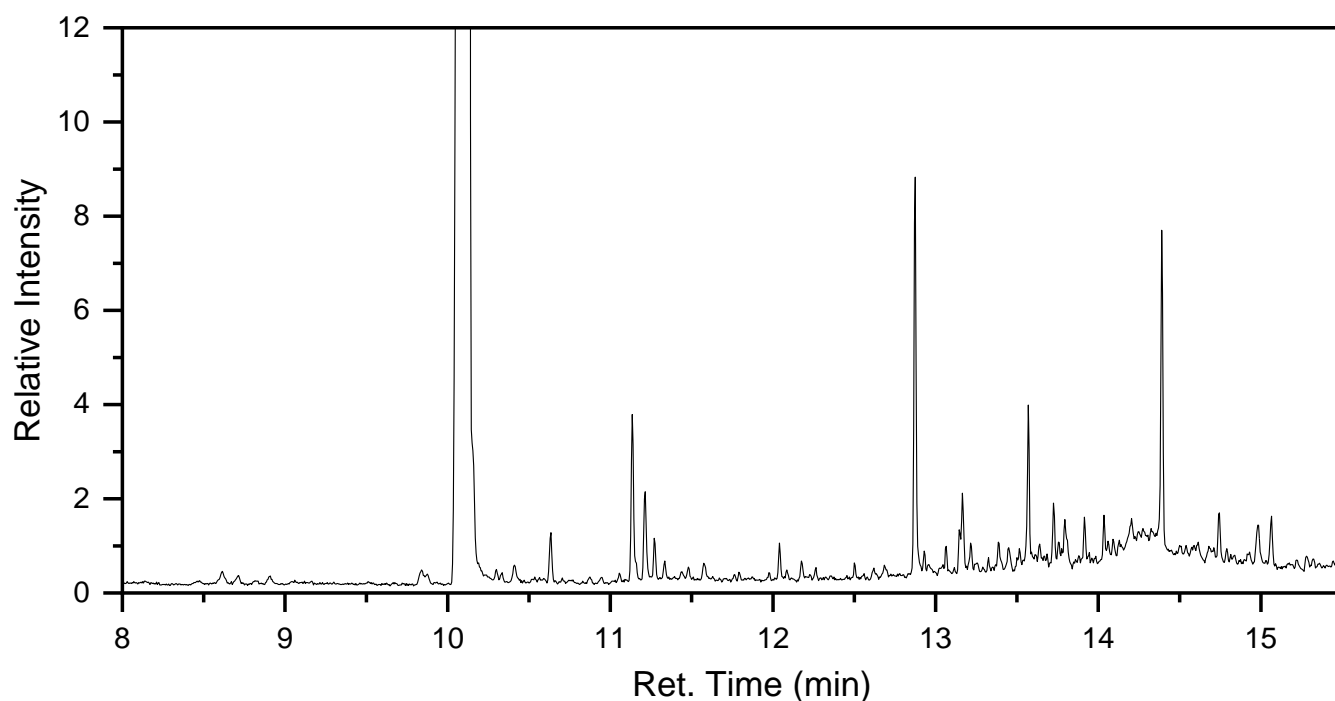


Figure S4. GC-MS trace of bio-oil obtained from photocatalytic depolymerization of KL catalyzed by H-MoO₃ (Conditions: UV-vis irradiation, solvent 0.01 M aqueous NaOH, WSL 200 ppm, H-MoO₃ 1 g/L, rt, 5 h). * IS impurities.

2. List of compounds identified in KL depolymerization bio-oil

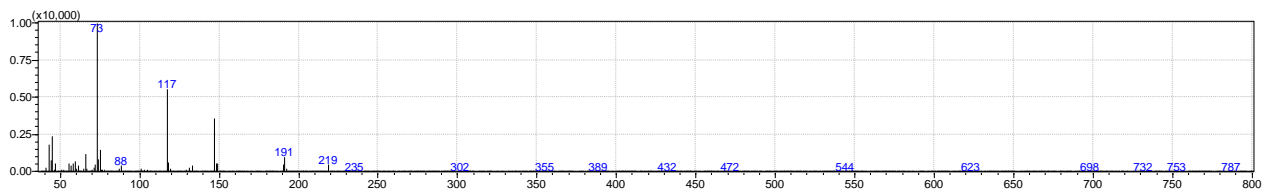
Table S1. List of compounds identified in the bio-oil produced in the photocatalytic depolymerization of KL (200 ppm) catalyzed by H-MoO₃ (1 g/L) in 0.01 M aqueous NaOH under UV-vis irradiation at room temperature for 5 h.

Compound	Ret. Time (min)
Lactic acid	8.70
3,5-Dimethylanisole (IS)	11.14
Benzoic acid	11.32
Glycerol	11.48
Succinic acid	11.76
Nonanoic acid	12.04
Decanoic acid	12.50
Adipic acid	12.70
2-hydroxybenzoic acid	12.72
Vanillin	12.87
4-hydroxybenzoic acid	13.15
Acetovanillone	13.17
Lauric acid	13.22
Vanillic acid	13.56
3-Guaiacyl propanol	13.73
Diisobutyl phthalate	13.92
Palmitic acid	14.38
Oleic acid	14.98
Stearic acid	15.06

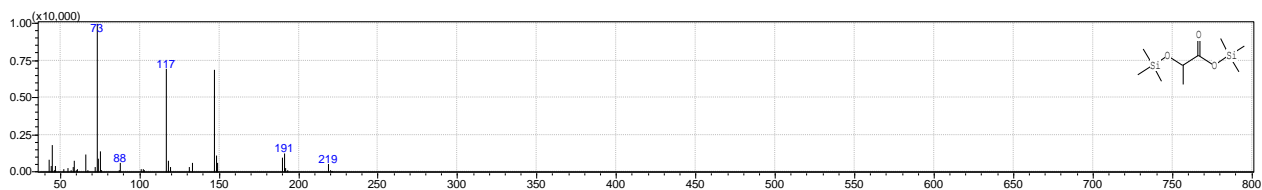
3. Mass spectra of identified products in bio-oil samples

In the following, MS spectra of identified products in bio-oil samples, in comparison with spectra of NIST11 database are reported.

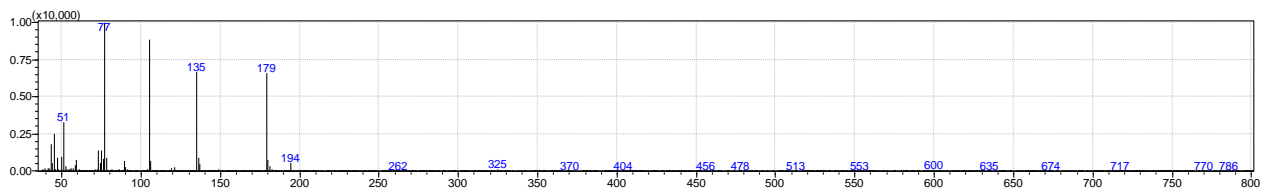
Lactic acid (rt = 8.70 min)



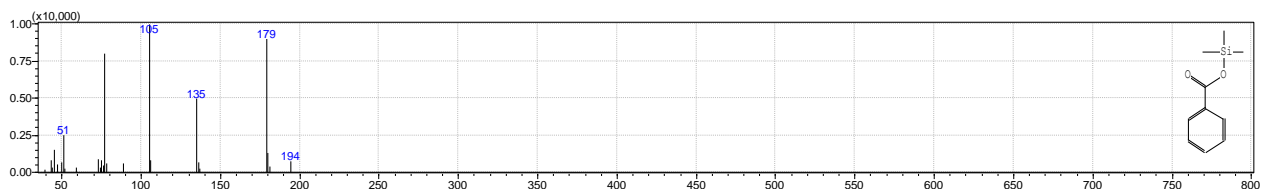
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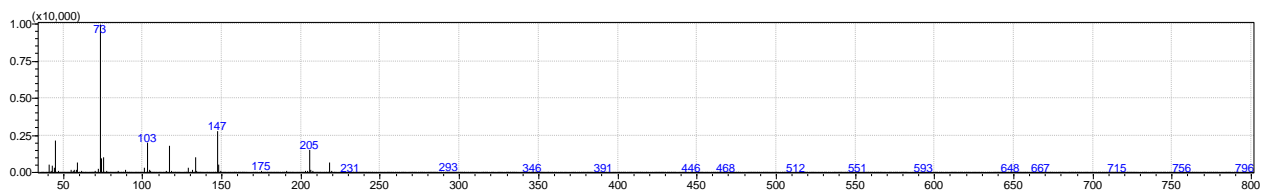
Benzoic acid (rt = 11.32 min)



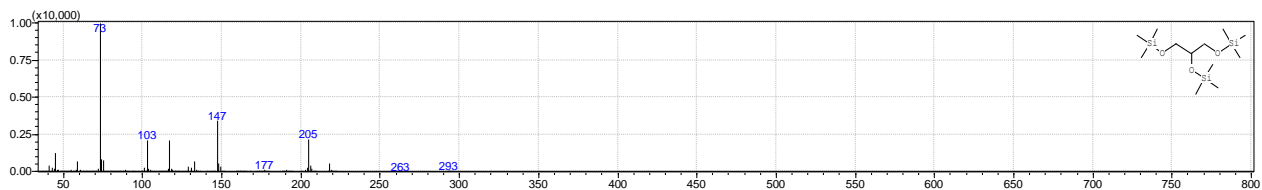
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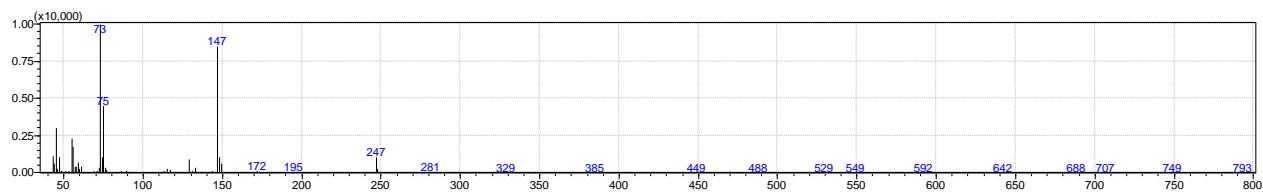
Glycerol (rt = 11.48 min)



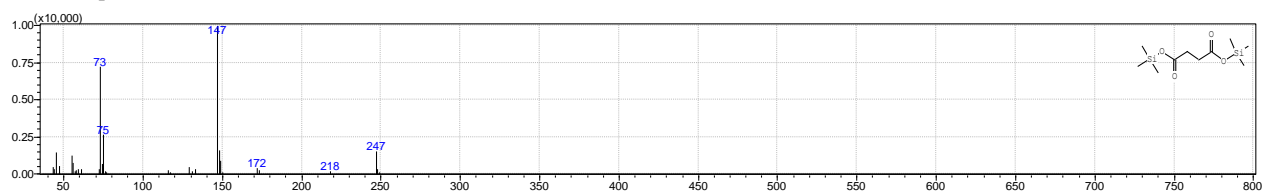
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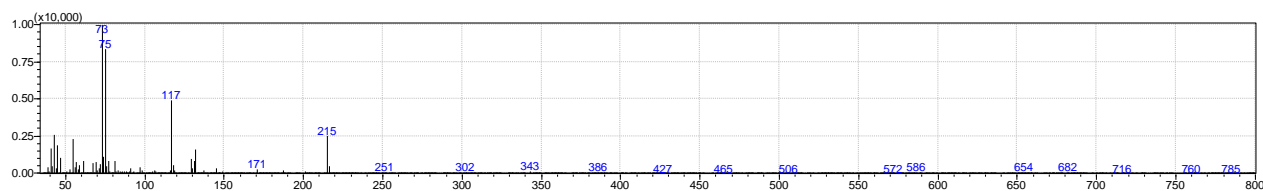
Succinic acid (rt = 11.76 min)



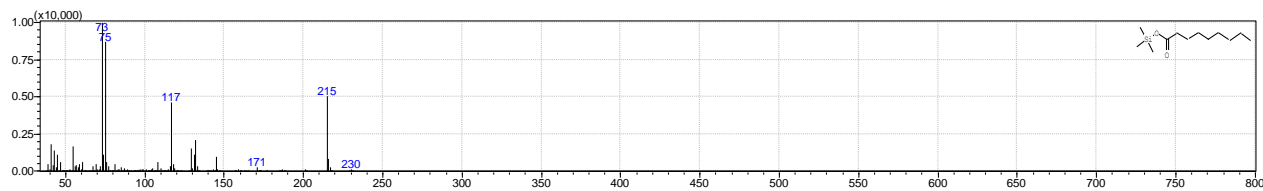
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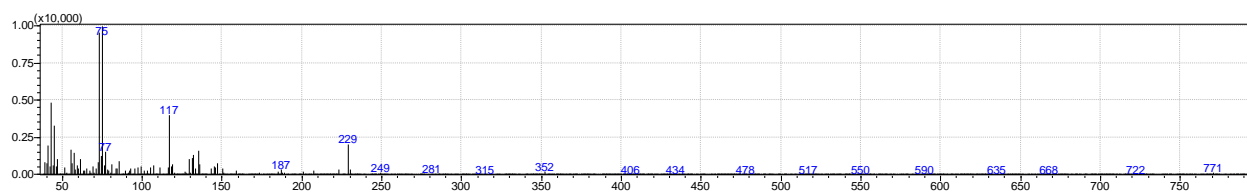
Nonanoic acid (rt = 12.04 min)



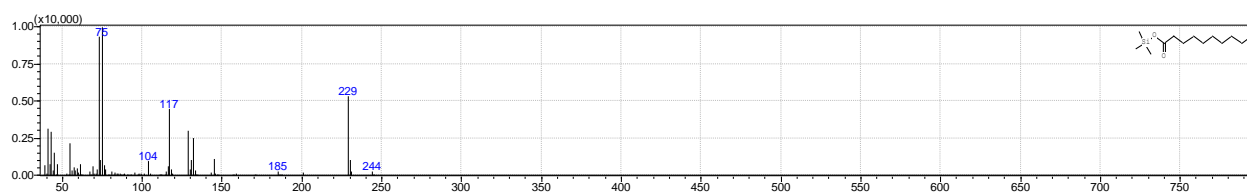
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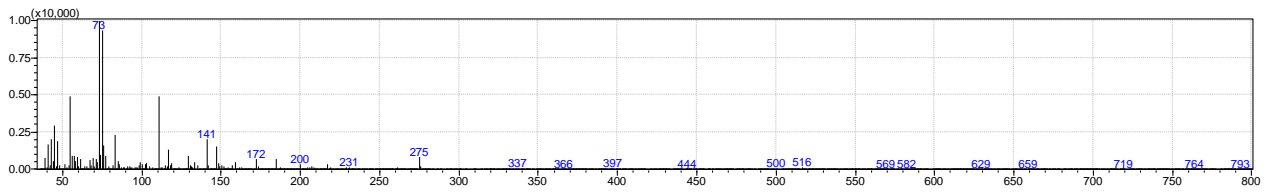
Decanoic acid (rt = 12.50 min)



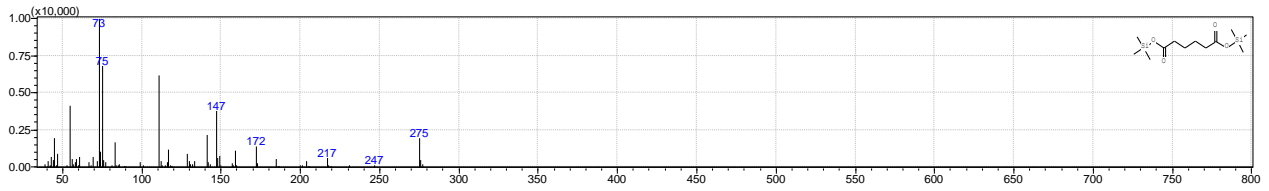
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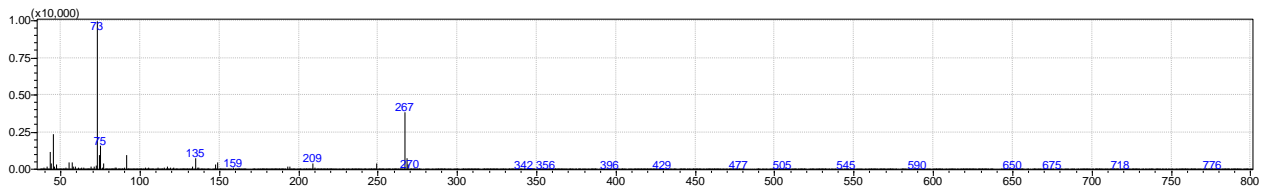
Adipic acid (rt = 12.70 min)



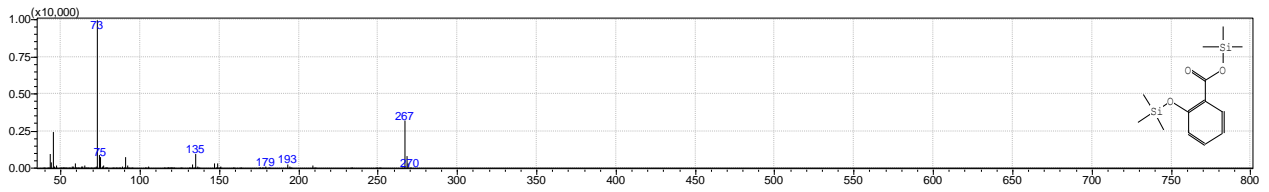
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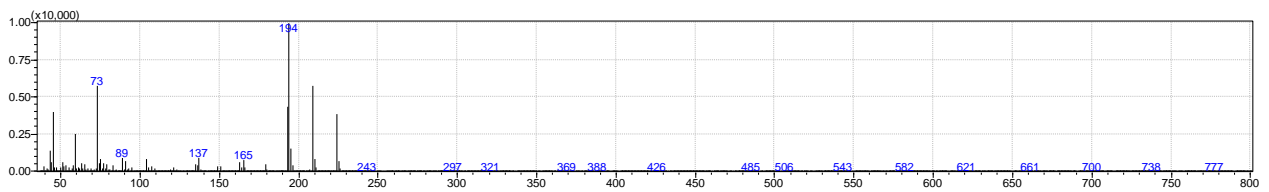
2-Hydroxybenzoic acid (rt = 12.72 min)



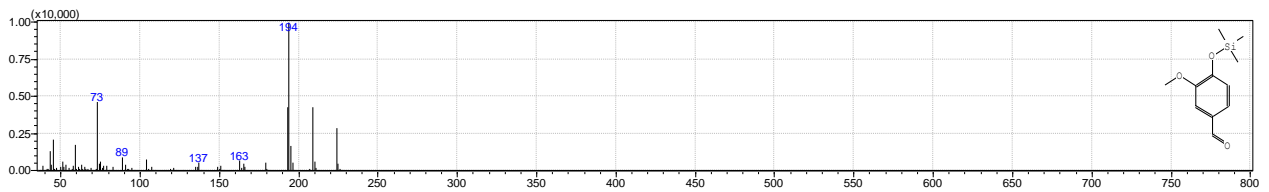
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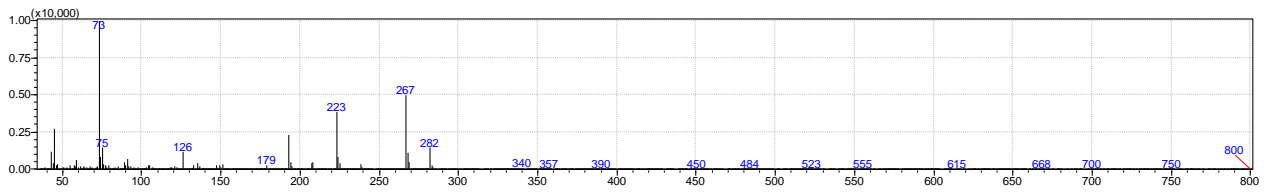
Vanillin (rt = 12.87 min)



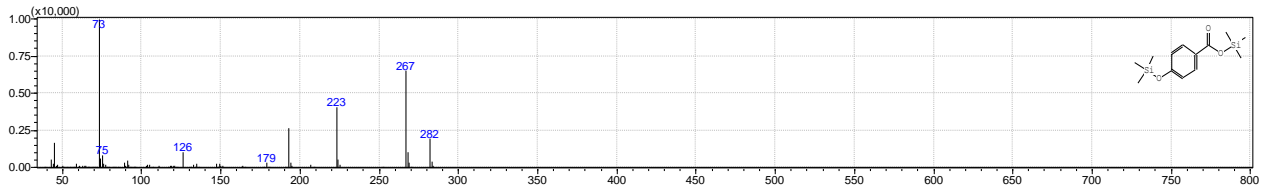
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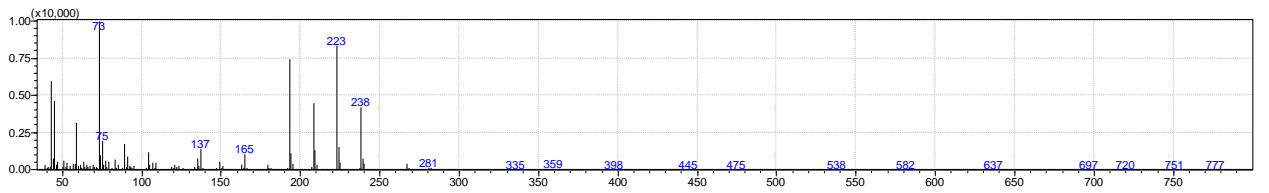
4-Hydroxybenzoic acid (rt = 13.15 min)



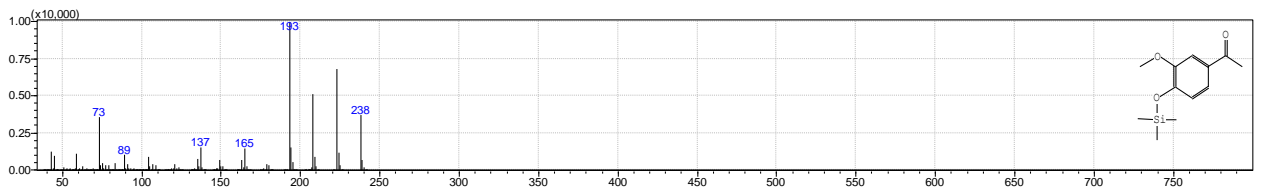
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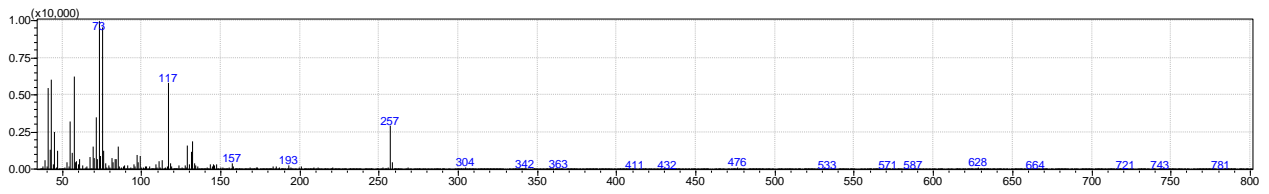
Acetovanillone (rt = 13.17 min)



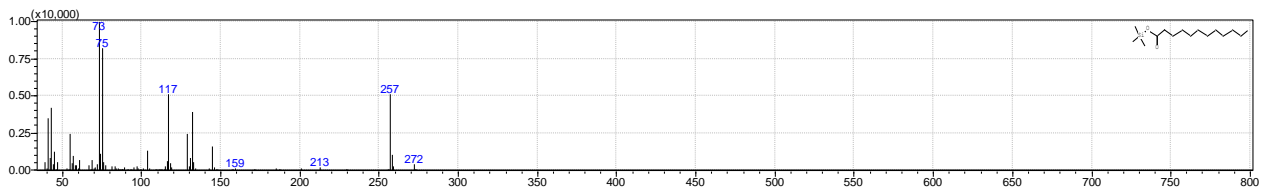
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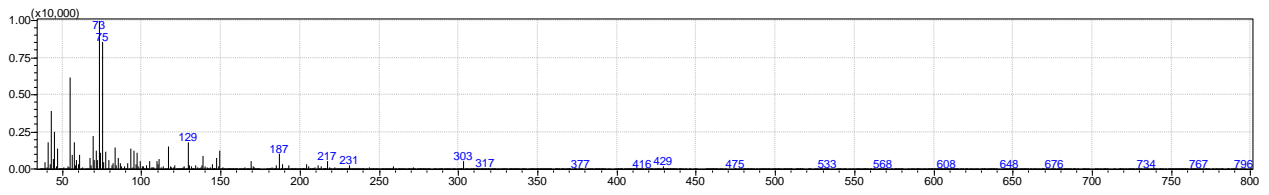
Lauric acid (rt = 13.22 min)



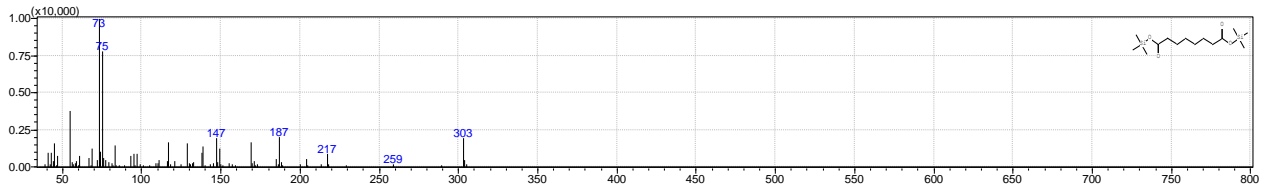
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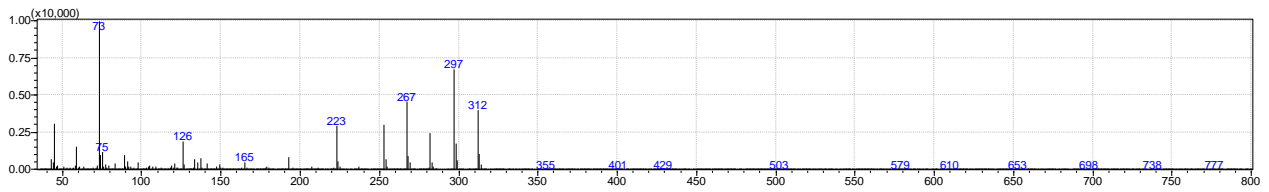
Suberic acid (rt = 13.36 min)



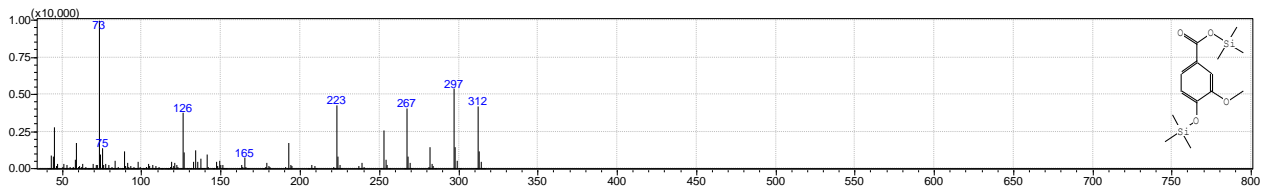
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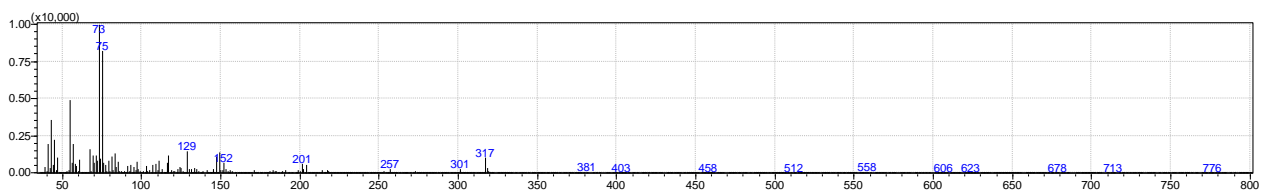
Vanillic acid (rt = 13.56 min)



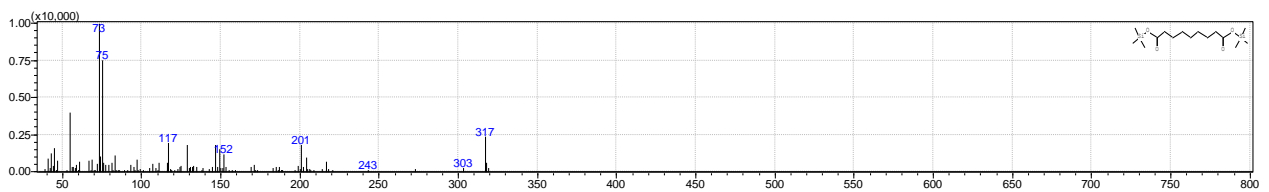
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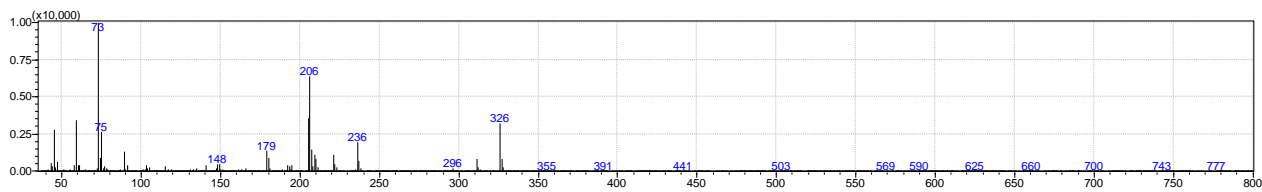
Azelaic acid (rt = 13.64 min)



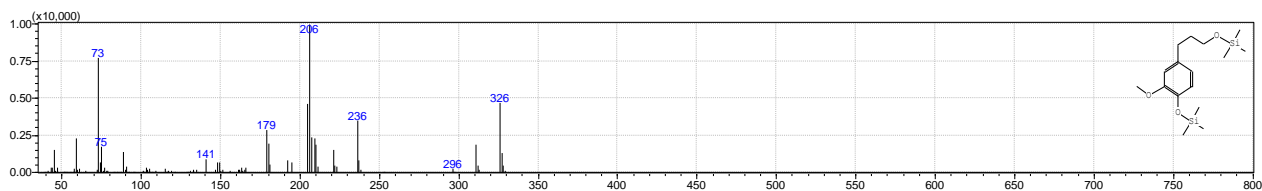
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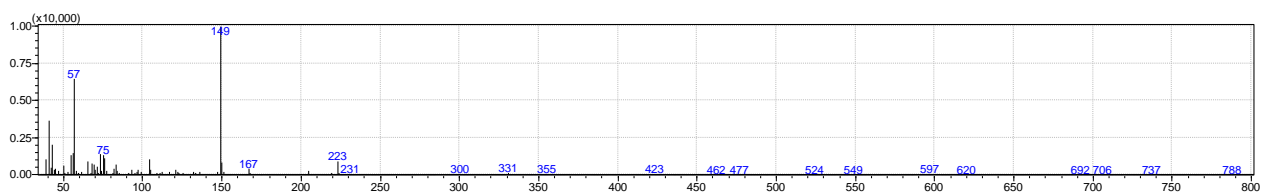
3-Guaiacylpropanol (rt = 13.73 min)



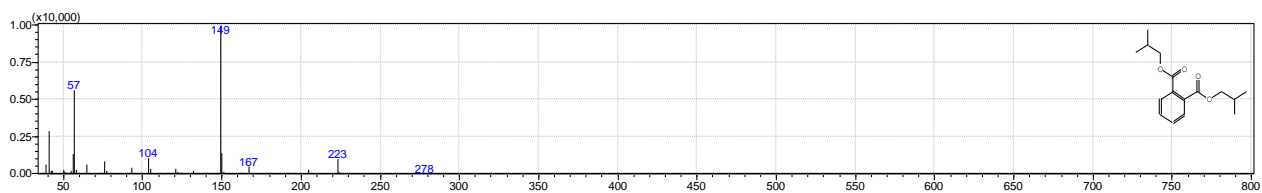
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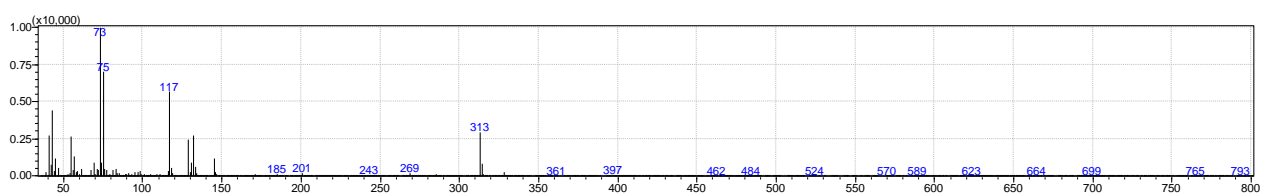
Diisobutyl phtalate (rt = 13.92 min)



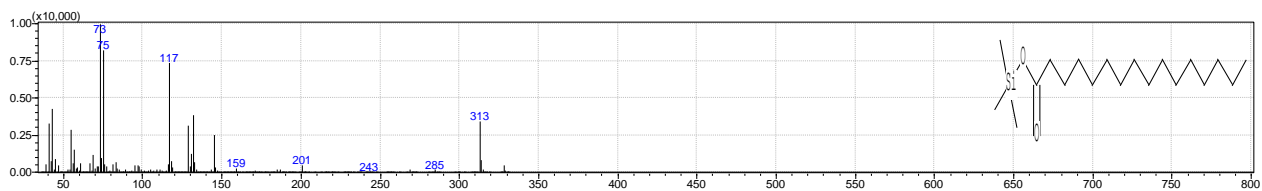
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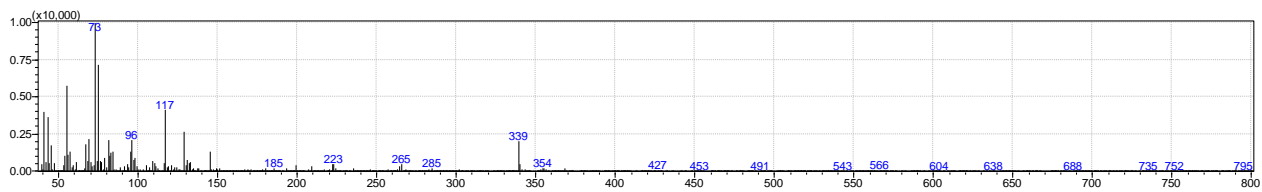
Palmitic acid (rt = 14.38 min)



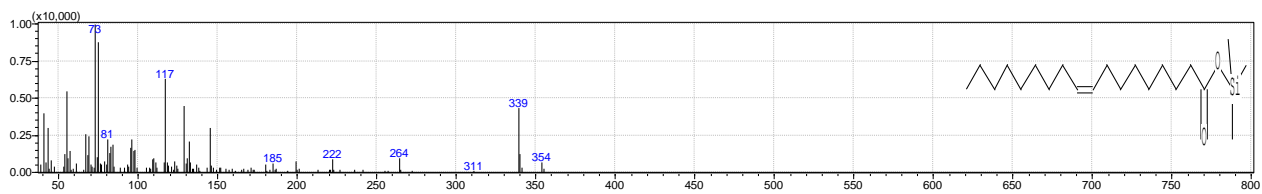
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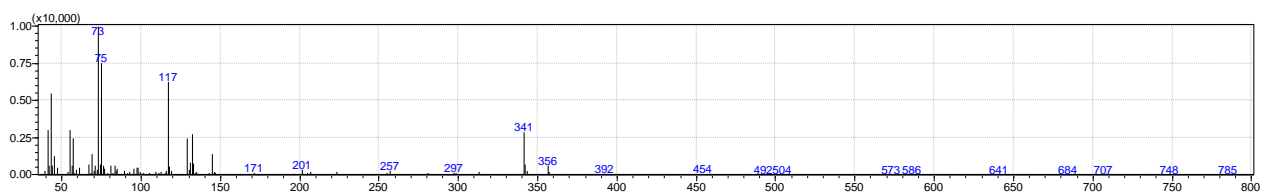
Oleic acid (rt = 14.98 min)



Database spectrum:



Stearic acid (rt = 15.06 min)



Database spectrum:

