

Prebiotic Chemistry: Chemical Evolution of Organics on the Primitive Earth under Simulated Prebiotic Conditions

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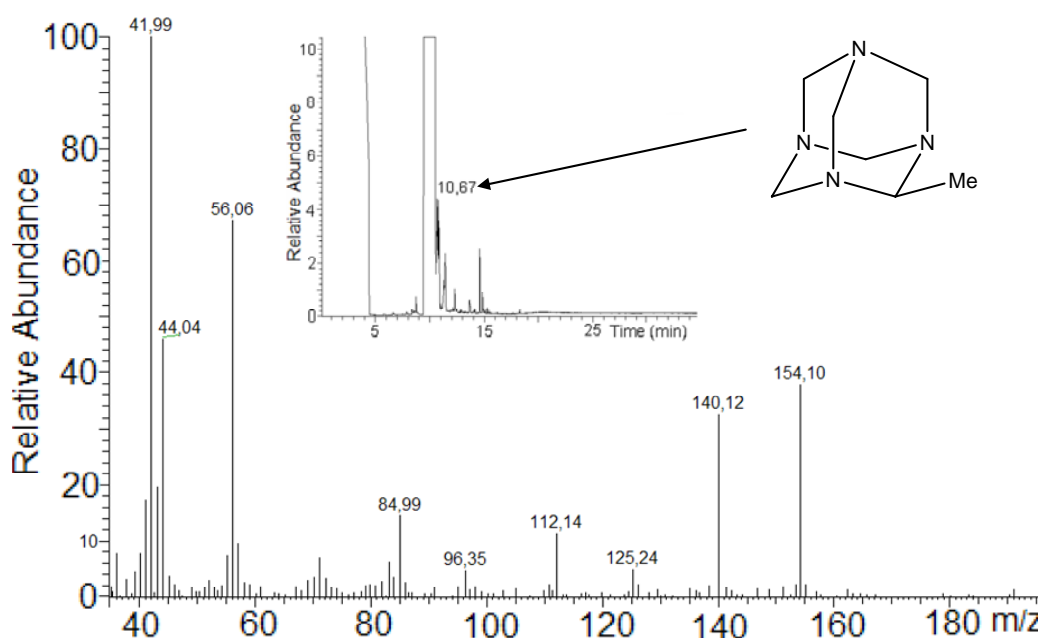
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Supplementary Material

Mass spectra were recorded on a DSQ Thermo Scientific Mass Spectrometer (transfer line temperature, 290°C; source temperature, 250°C; Scan segment, $m/z = 35\text{--}600$ Daltons; full scan rate, 920 Daltons min^{-1} ; start time, 4 min) coupled to a Focus GC Thermo Scientific RTX-5 Gas Chromatograph. Suitable separation of analytes was achieved using a HP-5 column (15 m x 0.25 mm inner diameter); helium was the carrier gas (1 mL min^{-1}). The oven temperature program was: 3 min at 50°C, from 50 to 300 C at 15°C min^{-1} and then the temperature was maintained at 300 °C for 10 min. Samples were analyzed by direct injection into the gas chromatograph/mass spectrometer following dilution of the resulting products with methanol.

Methanol solutions of pure HMT, 2,2,6,6-tetramethylpiperidin-4-one, mesityl oxide, 2,5-dimethylpyrrole and N-methylacetamide were used for comparison.

Mass spectral patterns of compounds cited in the article. Insets display the gas chromatograms of the mixtures analyzed.



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Figure S1 – Mass spectrum and gas chromatogram of the product **methyl-HMT**.

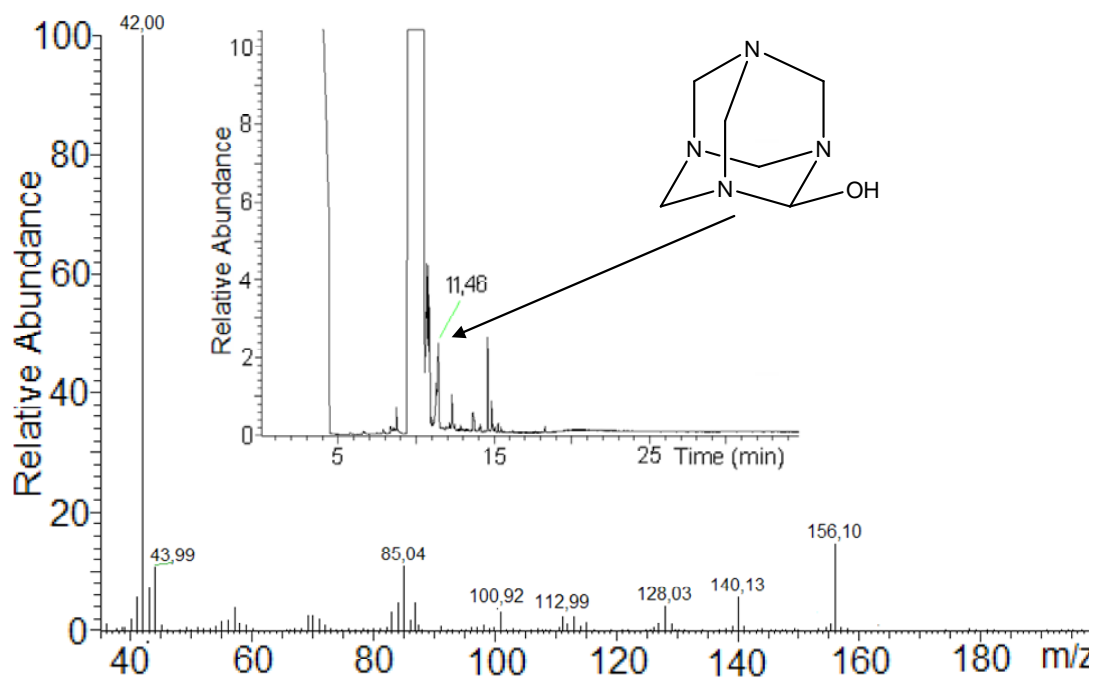


Figure S2 – Mass spectrum and gas chromatogram of the product **hydroxy-HMT**.

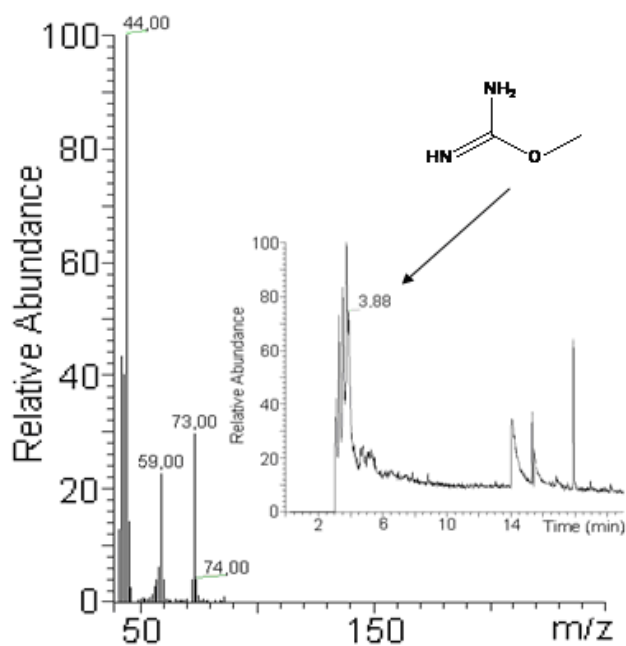


Figure S3 – Mass spectrum and gas chromatogram of the product **O-methylisourea**.

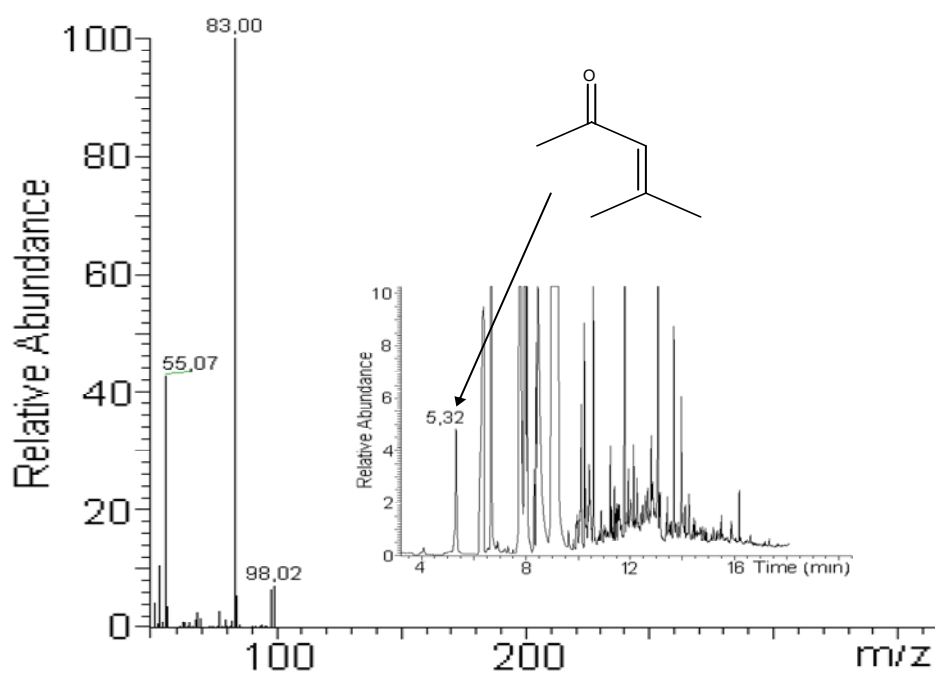


Figure S4 – Mass spectrum and gas chromatogram of the product **mesityl oxide**.

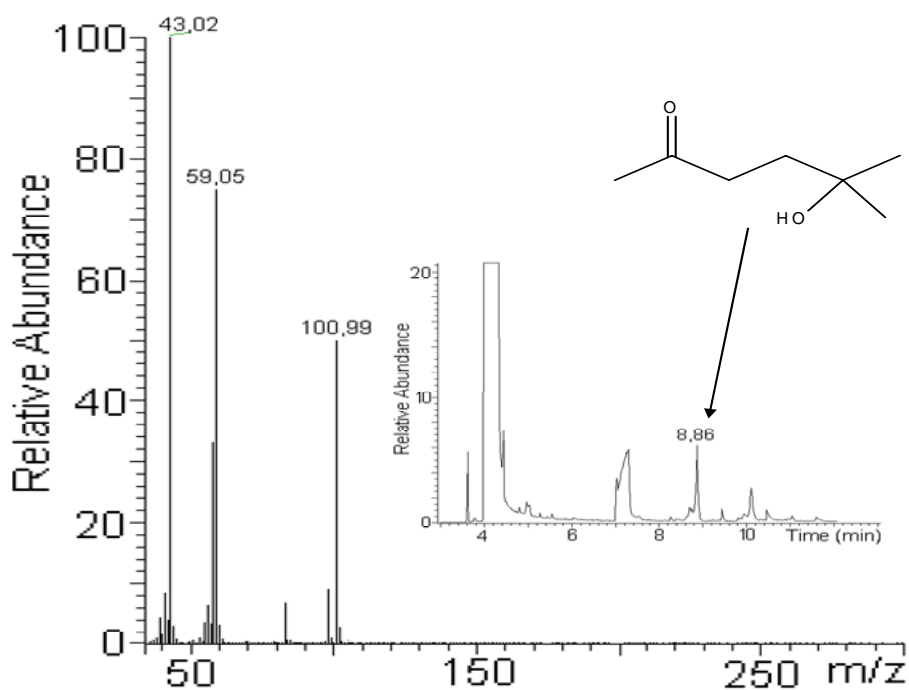


Figure S5 – Mass spectrum and gas chromatogram of the product **4-hydroxy-4-methylpentan-2-one**.

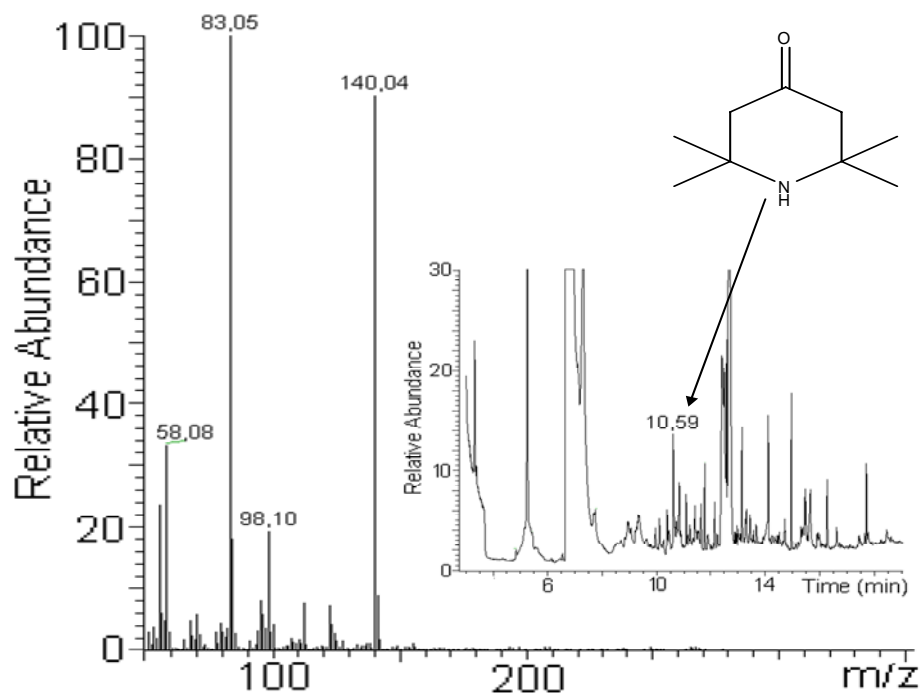


Figure S6 – Mass spectrum and gas chromatogram of the product **2,2,6,6-tetramethylpiperidin-4-one**.

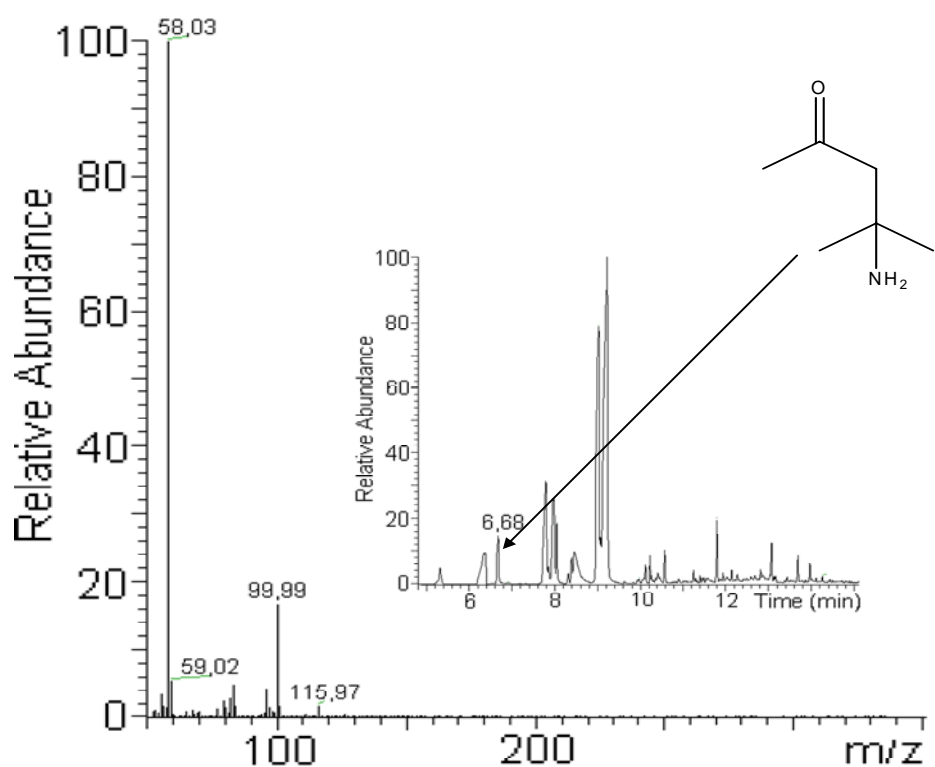


Figure S7 – Mass spectrum and gas chromatogram of the product **diacetoneamine**.

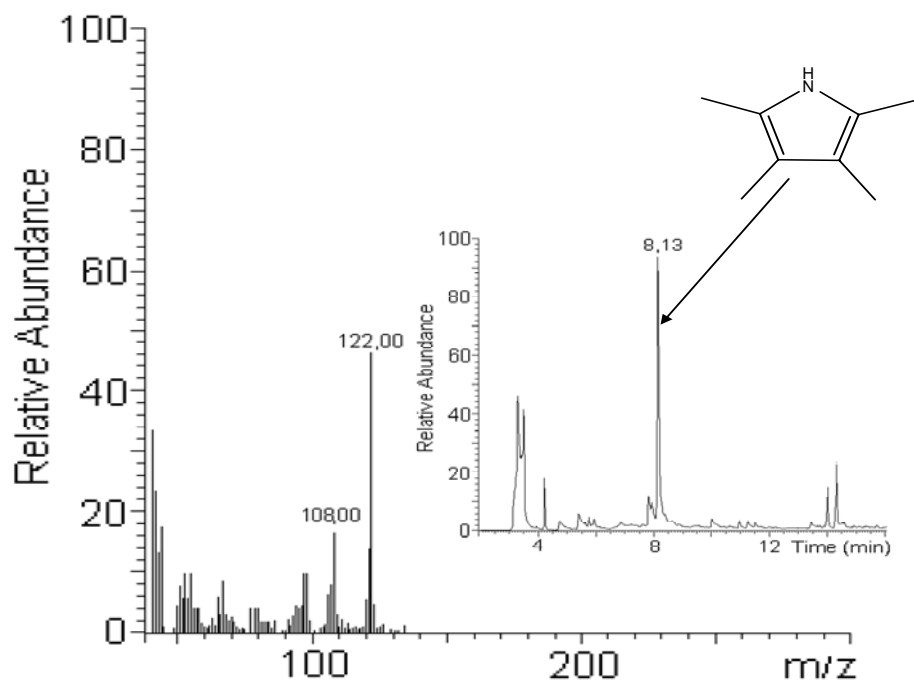


Figure S8 – Mass spectrum and gas chromatogram of the product **2,3,4,5-tetramethylpyrrole**.

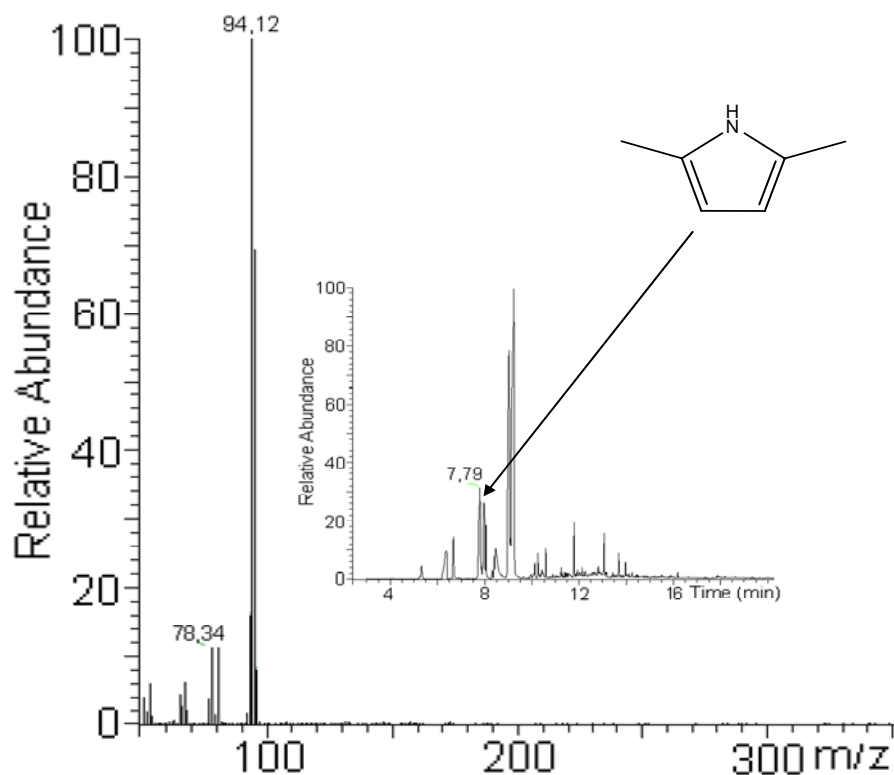


Figure S9 – Mass spectrum and gas chromatogram of the product **2,5-dimethylpyrrole**.

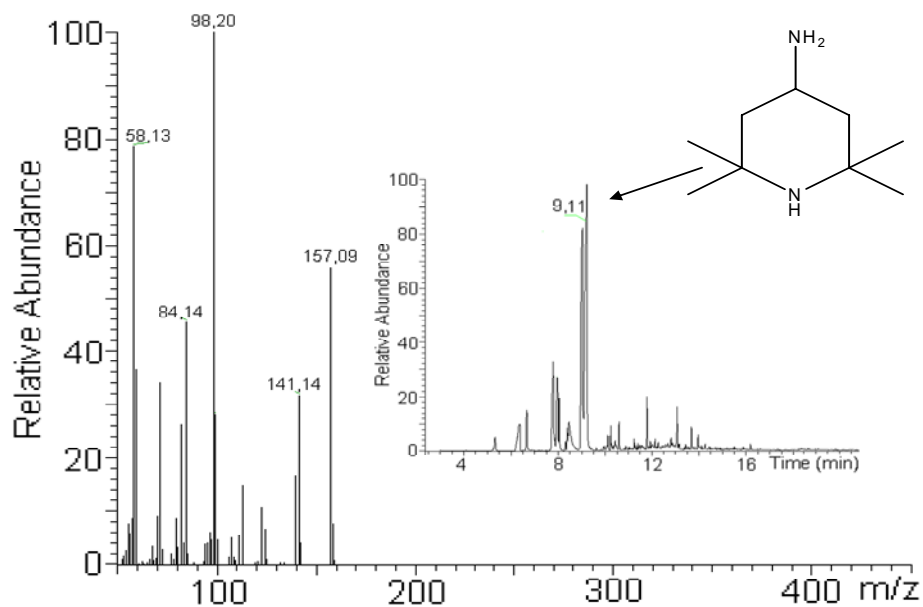


Figure S10 – Mass spectrum and gas chromatogram of the product **4-amino-2,2,6,6-tetramethylpiperidine**.

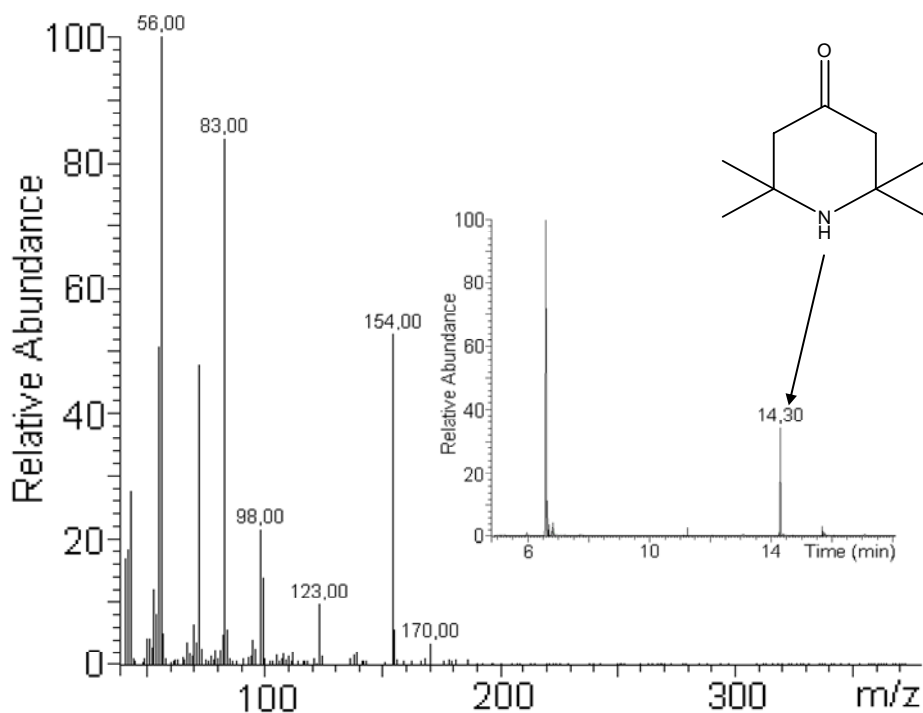


Figure S11 – Mass spectrum and gas chromatogram of the product **N-methyl-2,2,6,6-tetramethylpiperidin-4-one**.

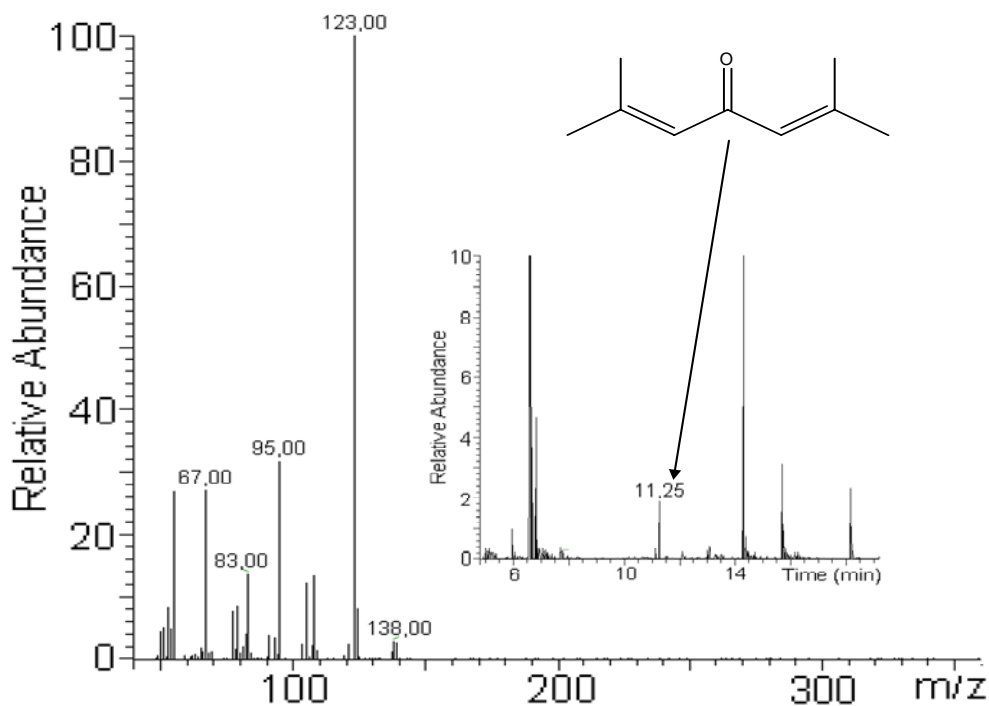


Figure S12 – Mass spectrum and gas chromatogram of the product **2,6-dimethyl-2,5-heptadien-4-one**.

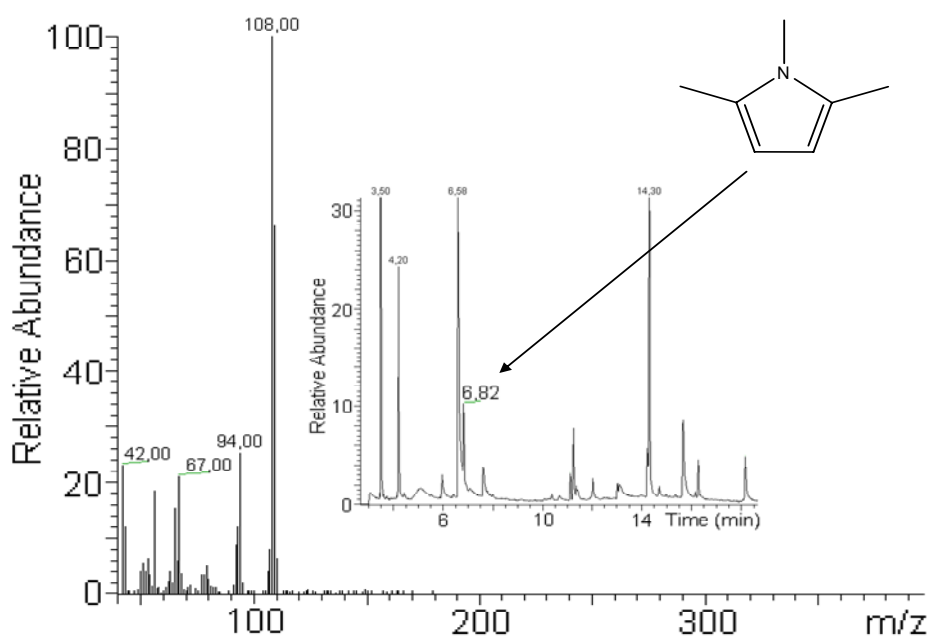


Figure S13 – Mass spectrum and gas chromatogram of the product **1,2,5-trimethylpyrrole**.

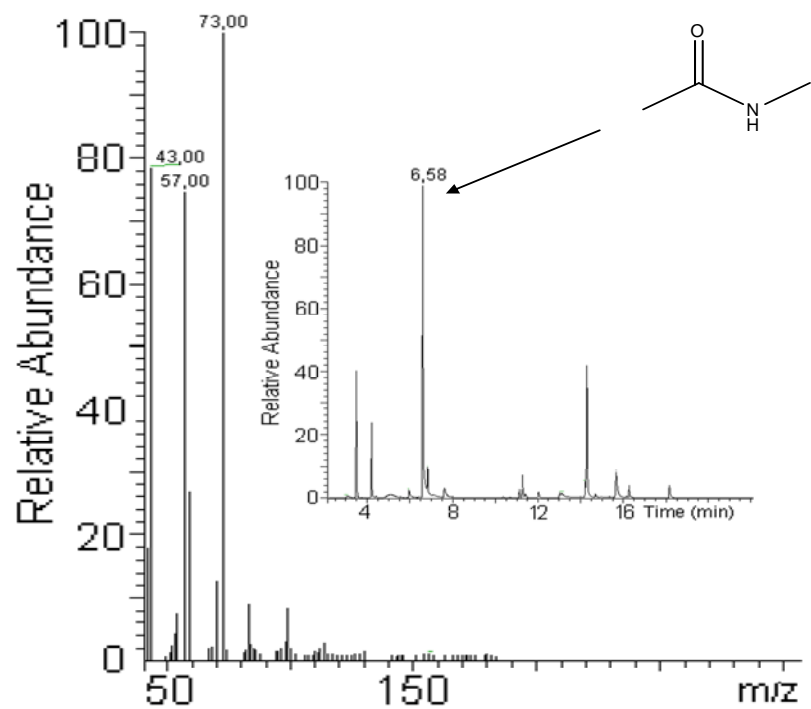


Figure S14 – Mass spectrum and gas chromatogram of the product **N-methylacetamide**.

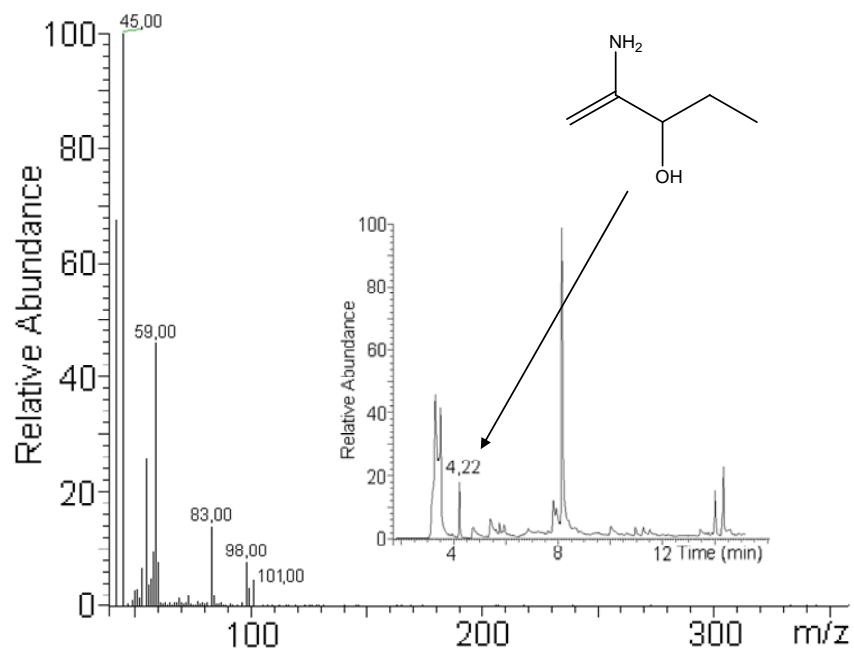


Figure S15 – Mass spectrum and gas chromatogram of the product **2-amino-3-hydroxy-1-pentene**.

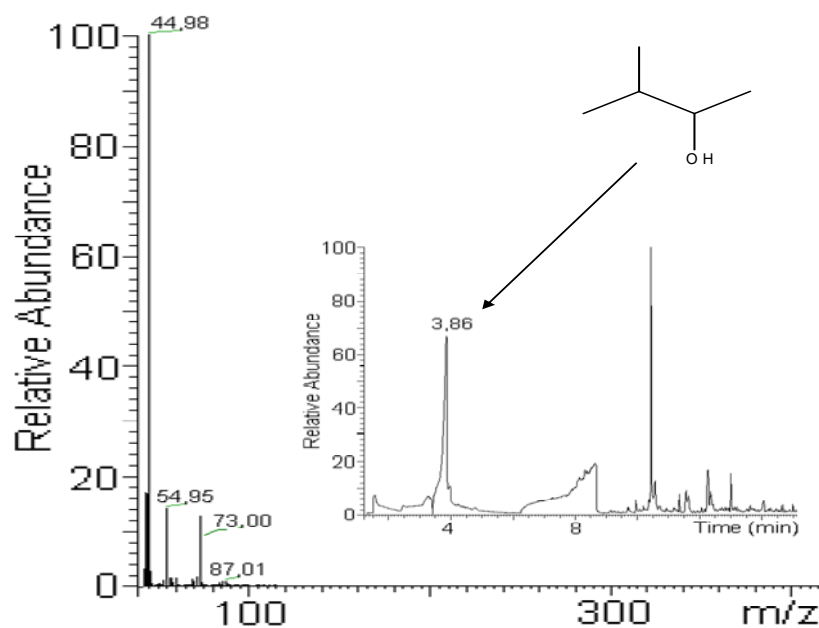


Figure S16 – Mass spectrum and gas chromatogram of the product **3-methylbutan-2-ol**.

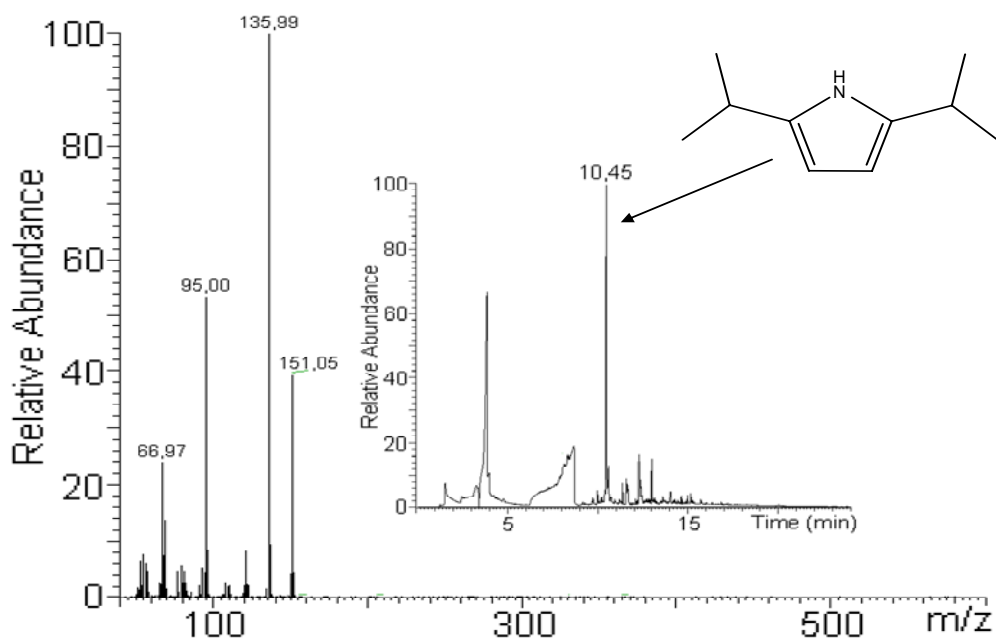


Figure S17 – Mass spectrum and gas chromatogram of the product **2,5-diisopropylpyrrole**.

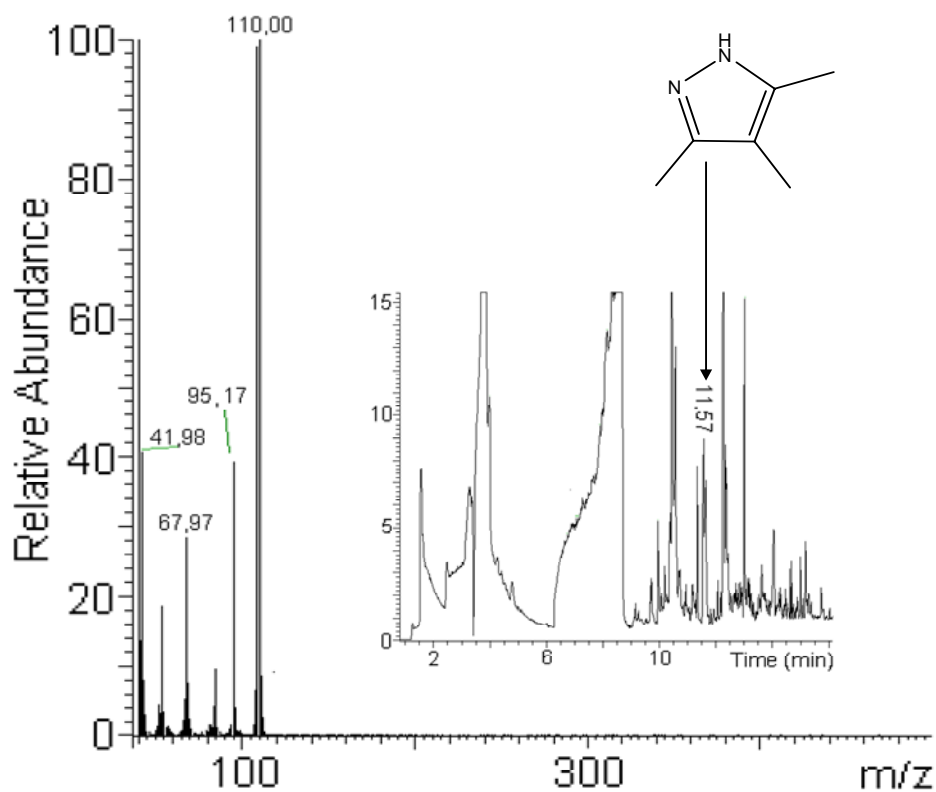


Figure S18 – Mass spectrum and gas chromatogram of the product **2,3,4-trimethylpyrazole**.

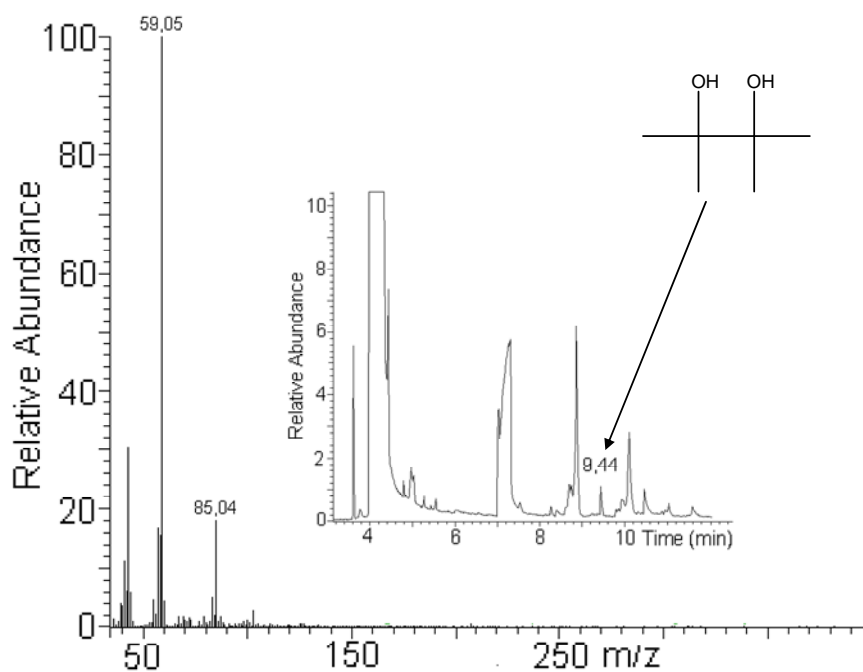


Figure S19 – Mass spectrum and gas chromatogram of the product **2,3-dimethylbutane-2,3-diol**.

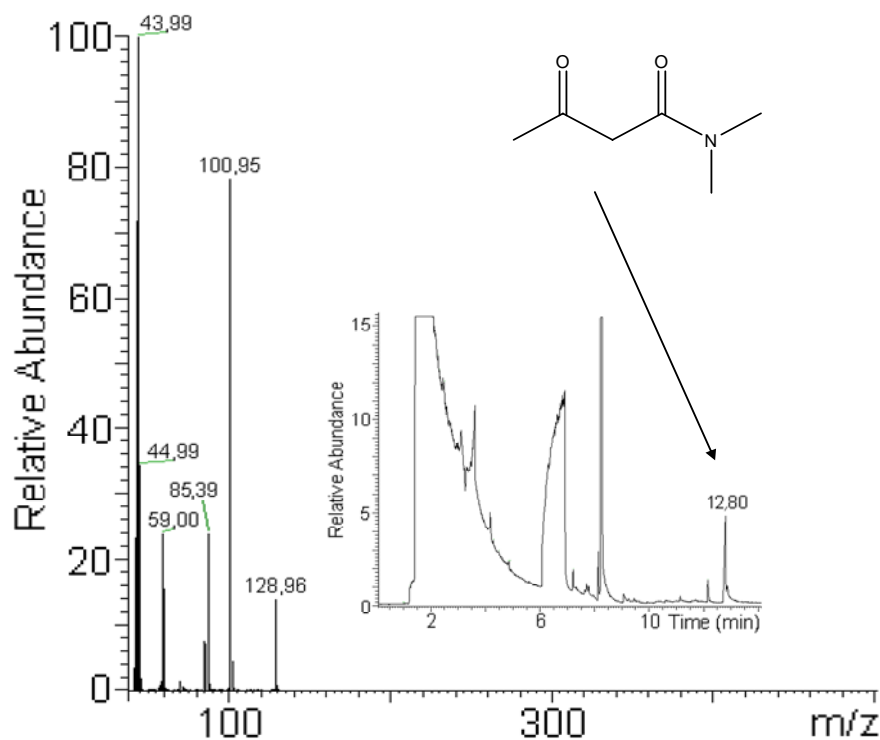


Figure S20 – Mass spectrum and gas chromatogram of the product *N,N*-dimethylbutanamide-3-one.

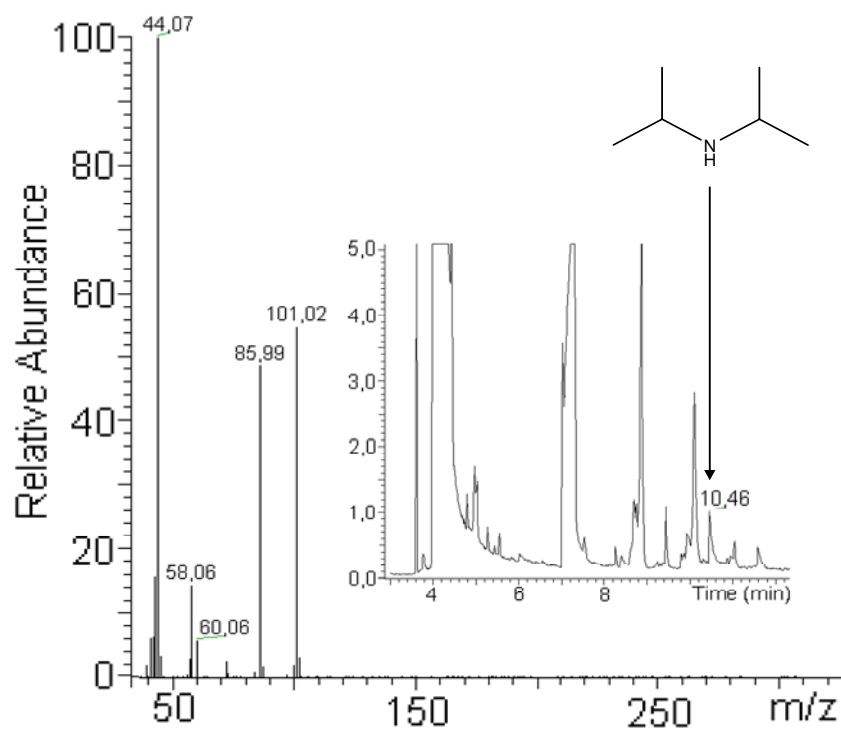


Figure S21 – Mass spectrum and gas chromatogram of the product diisopropylamine.

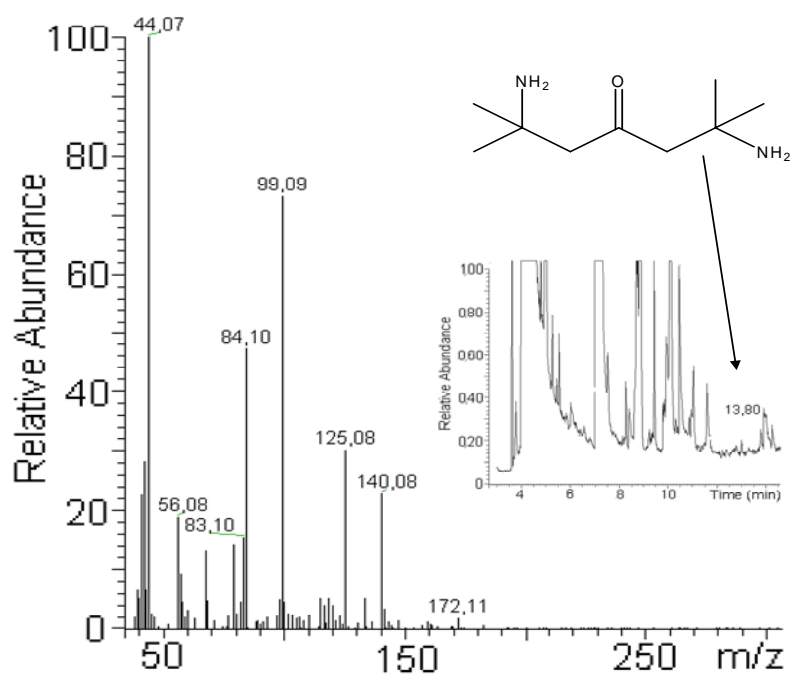


Figure S22 – Mass spectrum and gas chromatogram of the product **2,6-diamino-2,6-dimethylheptan-4-one**.

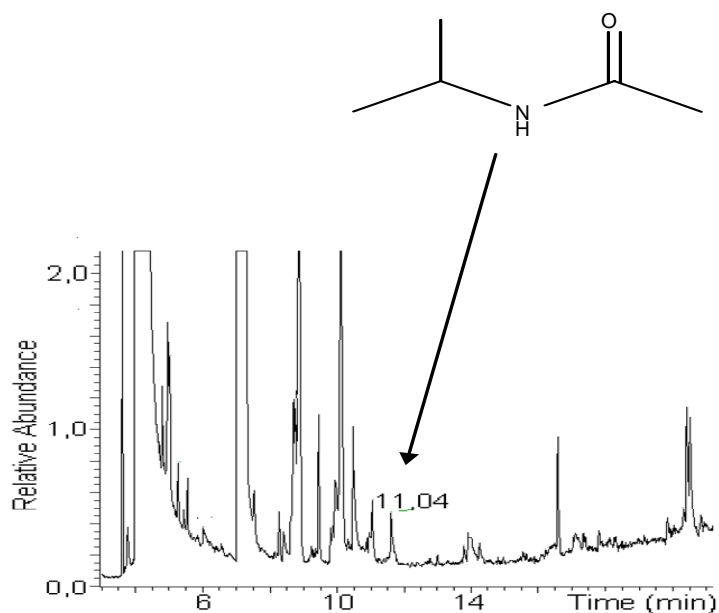


Figure S23 – Gas chromatogram of the product **N-isopropylacetamide**.