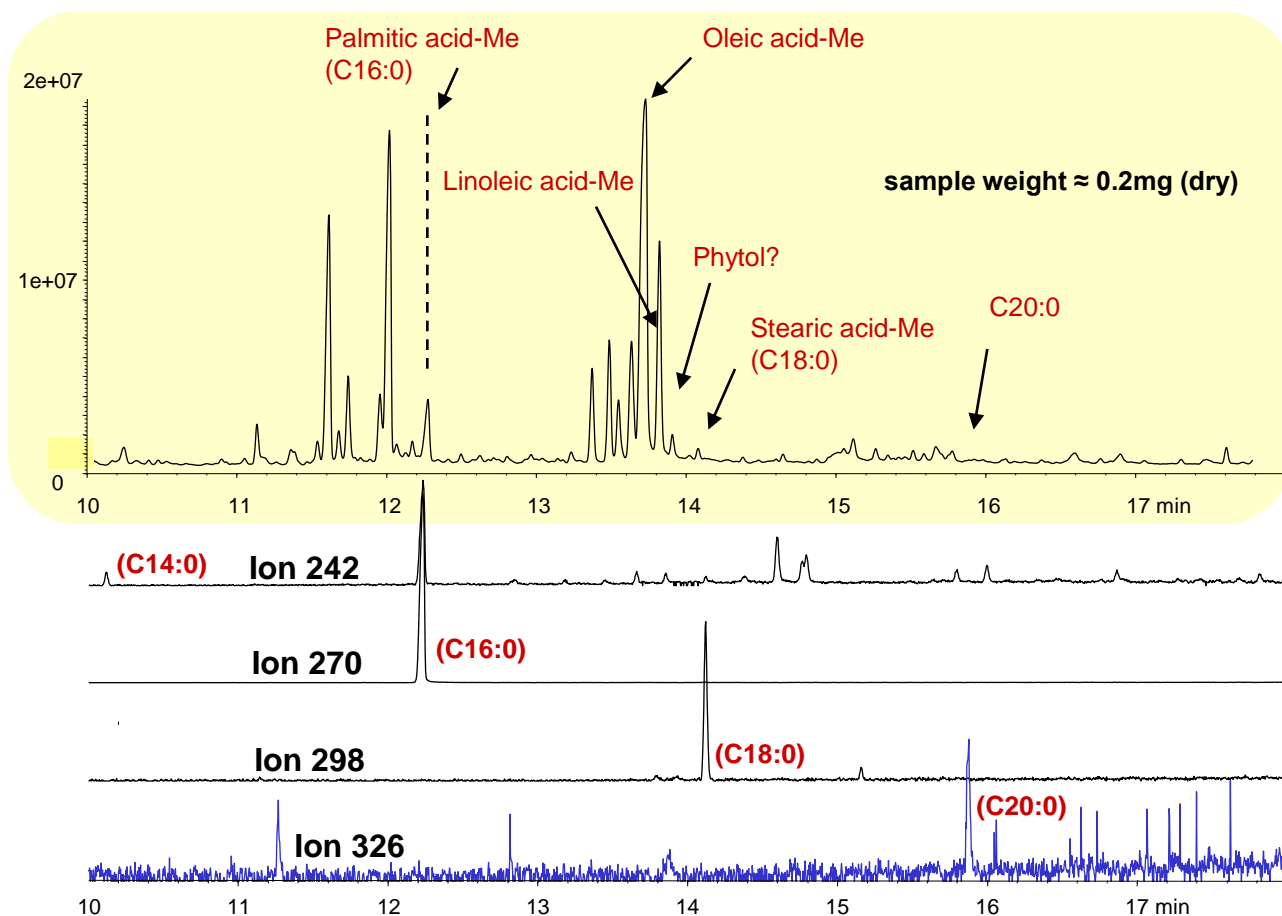


# Characterization of the fatty acid profile in algae using reactive pyrolysis

**[Background]** Beginning in the 1970s the use of algae for the production of energy has been of great interest. Studies show that algae can produce up to 60% of their biomass in the form of oil. Profiling the lipids in algae using conventional methodologies is cumbersome, expensive and often yields data of low quality. Algae can be directly analyzed using thermally assisted hydrolysis and methylation (TMA), i.e., Reactive Pyrolysis (RxPy) – GC/MS.

**[Experimental]** 0.2 mg of dried algae was placed in a sample cup, 10 µL of trimethylsulfonium hydroxide (TMSH) in methanol (0.2M) was added and the cup was dropped into the pyrolyzer's furnace (350°C) in an He atmosphere. The gas-phase reactions occurred instantaneously. The methylated acids were separated and analyzed using GC/MS.

**[Results]** The individual fatty acids can easily be identified and quantitated using extracted ion chromatograms. The separation and identification of the isomers is a function of the column's stationary phase, the phase ratio and the GC oven's temperature profile. The distribution of the fatty acids is one of the primary means used to differentiate algae strains.



<Reactive pyrolysis conditions>

Pyrolyzer: 350°C, separation column: UA-5 (MS/HT) 30m, 0.25mm id., DF=0.25µm, oven temperature: 100~320°C at 10°C/min (10 min hold), He: 1.0 mL/min, split ratio: 1/40, sample weight: ca. 0.2mg (dry), 0.2M TMSH in methanol: 10 µL

**Keywords :** Reactive pyrolysis

**Products used :** Multi-functional pyrolyzer, Vent-free GC/MS adapter, UA-5 (MS/HT)

**Applications :** Algae, Biomass, Reactive pyrolysis

**Related technical notes :**

Please forward your inquiries via our web page or send us a fax message.

**R&D and manufactured by :**  
Frontier Laboratories Ltd.

Phone: (81)24-935-5100 Fax: (81)24-935-5102  
http://www.frontier-lab.com/