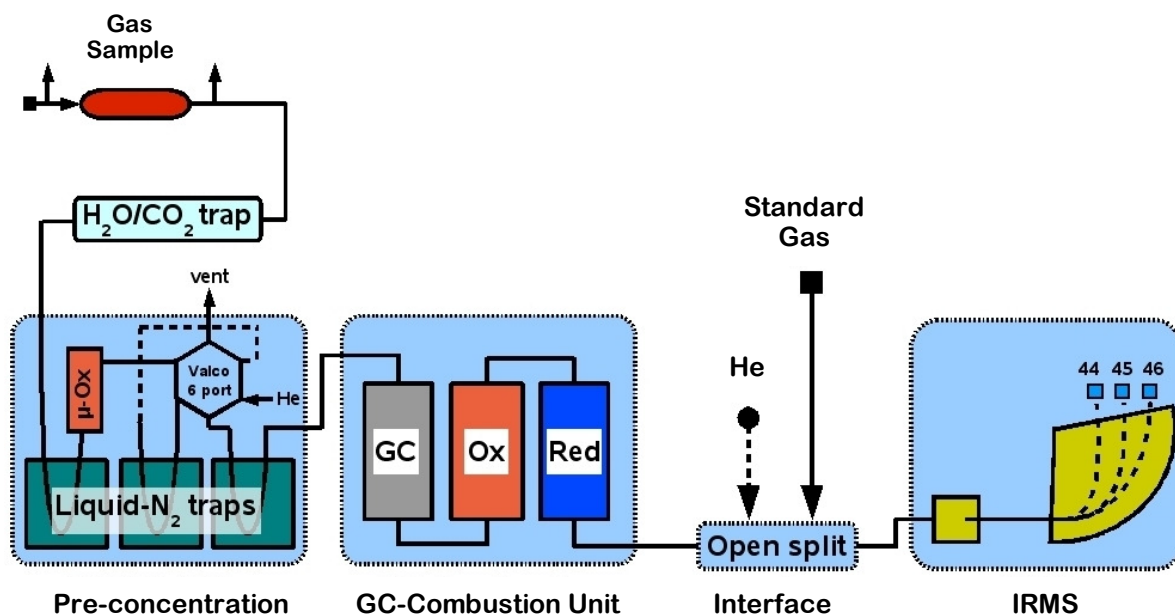


Determination of carbon isotopic composition:

GC-IRMS - Gas Chromatography Isotope Ratio Mass Spectrometry

GC-IRMS offers an elegant, simple and increasingly popular method to determine the carbon isotopic composition ($^{13}\text{C}/^{12}\text{C}$) of individual hydrocarbons. The ratio of these isotopes in natural materials varies slightly as a result of isotopic fractionation due to physical, chemical and biological processes. Carbon isotope ratios can be used to establish the relationship between organic compounds and their source materials. It changes with the age of the material and is therefore used in geological determination.



Standards for individual n-alkanes with 11 to 40 carbons and verified $\delta^{13}\text{C}$ values are now available from Chiron!

Preparation of reference materials

Several alternative sources of hydrocarbon materials were carefully checked for purity by NMR and GC. The hydrocarbons selected were prepared by distillation of hydrogenated α -olefins. For crystalline compounds, the material was carefully homogenized in order to avoid possible referential crystallization of certain isotopes.

δ -values are relative to the PDB Belemnite Standard with MS internal precision of 0.01 ‰ and duplicate reproducibility of ± 0.10 ‰. NBS-22 was used as internal standard.



Available from Chiron:

Individual Standards:

Chiron No.	Product	CAS
0414.11-150-CY	<i>n</i> -Undecane, $\delta^{13}\text{C}$: -26.11	1120-21-4
0415.12-150-CY	<i>n</i> -Dodecane, $\delta^{13}\text{C}$: -32.54	112-40-3
0416.13-150-CY	<i>n</i> -Tridecane, $\delta^{13}\text{C}$: -33.47	629-50-5
0417.14-150-CY	<i>n</i> -Tetradecane, $\delta^{13}\text{C}$: -33.13	629-59-4
0418.15-150-CY	<i>n</i> -Pentadecane, $\delta^{13}\text{C}$: -30.22	629-62-9
0419.16-150-CY	<i>n</i> -Hexadecane, $\delta^{13}\text{C}$: -33.71	544-76-3
0420.17-150-CY	<i>n</i> -Heptadecane, $\delta^{13}\text{C}$: 25.72	629-78-7
0421.18-150-CY	<i>n</i> -Octadecane, $\delta^{13}\text{C}$: -30.71	593-45-3
0422.19-150-CY	<i>n</i> -Nonadecane, $\delta^{13}\text{C}$: -34.60	629-92-5
0423.20-150-CY	<i>n</i> -Eicosane, $\delta^{13}\text{C}$: -33.06	112-95-8
0400.21-150-CY	<i>n</i> -Heneicosane, $\delta^{13}\text{C}$: -28.59	629-94-7
0401.22-150-CY	<i>n</i> -Docosane, $\delta^{13}\text{C}$: -30.35	629-97-0
0402.23-150-CY	<i>n</i> -Tricosane, $\delta^{13}\text{C}$: -26.71	638-67-5
0403.24-150-CY	<i>n</i> -Tetracosane, $\delta^{13}\text{C}$: -26.42	646-31-1
0404.25-150-CY	<i>n</i> -Pentacosane, $\delta^{13}\text{C}$: -28.21	629-99-2
0405.26-150-CY	<i>n</i> -Hexacosane, $\delta^{13}\text{C}$: -34.35	630-01-3
0406.27-150-CY	<i>n</i> -Heptacosane, $\delta^{13}\text{C}$: -25.48	593-49-7
0407.28-150-CY	<i>n</i> -Octacosane, $\delta^{13}\text{C}$: -29.85	630-02-4
0408.30-150-CY	<i>n</i> -Triacontane, $\delta^{13}\text{C}$: -28.60	638-68-6
0409.32-150-CY	<i>n</i> -Dotriacontane, $\delta^{13}\text{C}$: -28.34	544-85-4
0410.36-150-CY	<i>n</i> -Hexatriacontane, $\delta^{13}\text{C}$: -26.15	630-06-8
0411.40-150-CY	<i>n</i> -Tetracontane, $\delta^{13}\text{C}$: -27.05	4181-95-7

Mixtures of individual standards:

Chiron No.	Product	Description
0451.3-150-CY	GC-IRMS Standards (C11($\delta^{13}\text{C}$: -26.11); C15 ($\delta^{13}\text{C}$: -30.22); C20 ($\delta^{13}\text{C}$: -33.06))	3 component mixture
0452.3-150-CY	GC-IRMS Standards (C15 ($\delta^{13}\text{C}$: -30.22); C20 ($\delta^{13}\text{C}$: -33.06); C25 ($\delta^{13}\text{C}$: -28.21))	3 component mixture
0453.3-150-CY	GC-IRMS Standards (C25 ($\delta^{13}\text{C}$: -28.21); C30 ($\delta^{13}\text{C}$: -28.60); C36 ($\delta^{13}\text{C}$: -26.15))	3 component mixture
0454.4-150-CY	GC-IRMS Standards ((C25 ($\delta^{13}\text{C}$: -28.21); C30 ($\delta^{13}\text{C}$: -28.60); C36 ($\delta^{13}\text{C}$: -26.15); C40 ($\delta^{13}\text{C}$: -27.05))	4 component mixture

All products are available as 150 $\mu\text{g}/\text{mL}$ solution in cyclohexane, **1x1mL, 5x1mL or 10x1mL**

Literature:

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 Hayes, J., Popp, B. N., Takiguku, R., and Johnson, M. W. *Geochim. Cosmochim. Acta* 53, 2961-2972. 1989.
 Ocampo, R., Callot, H. J., Albrecht, P., Popp, B. N., Horowitz, M. R. and Hayes, R. M. *Naturwissenschaften* 76, 419-421. 1989.
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 GC-IRMS for compound specific isotope ratio mass spectrometry. (*Brochure and application notes*). Fisons Instruments 1994.