

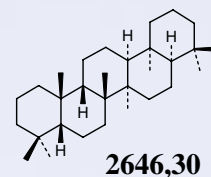
# Biomarker Focus

## Gammacerane

### Occurrence and origin:

Pentacyclic triterpanes like gammacerane are **ubiquitous constituents of sedimentary organic matter**.

The only known precursor of gammacerane is tetrahymanol. Tetrahymanol originate from protozoa<sup>1</sup> and has been associated with ciliates that feed on anaerobic bacteria.

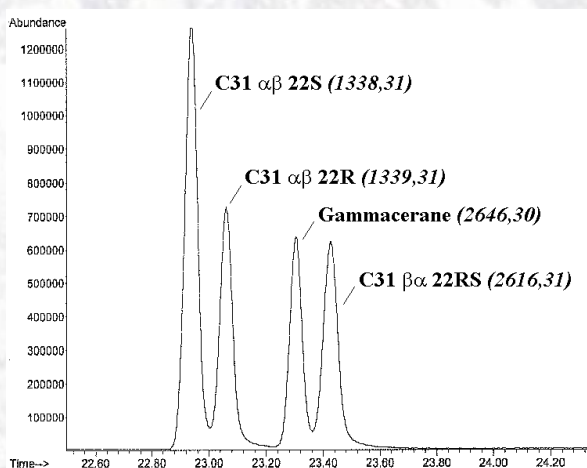


### Geochemical relevance and use in oil spill analysis

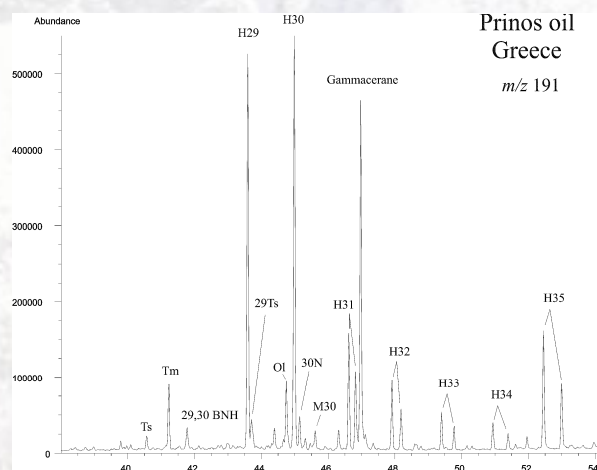
Gammacerane has frequently been associated with **hypersaline lacustrine environments** and gammacerane structures were shown to be **reliable geochemical indicators** for water column stratification in marine deposits.<sup>2</sup> Gammacerane is one of several diagnostic biomarkers useful in **oil spill analysis**.<sup>3,4</sup>

## Methods of Analysis

Gammacerane elutes from the **gas chromatograph** behind C31  $\alpha\beta$  22R homohopane ( $\alpha\beta$ 31 22R) and just in front of C31  $\beta\alpha$  22R+S homohopanes ( $\beta\alpha$ 31), thus making the detection of gammacerane rather difficult. Several laboratories have **misidentified gammacerane** for this reason<sup>3</sup>



**Figure 1.**  
GC-MS of a mixture of synthetic gammacerane and  $\alpha\beta$ 31 and  $\beta\alpha$ 31 isomers.

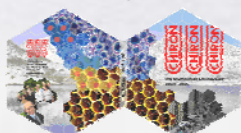


**Figure 2.**  
GC-MS of Prinos oil, Greece  
(Courtesy of Peter Nytoft, GEUS, Denmark)

### References:

1. Mallory et al. J. Am. Chem. Soc., 1963; 85, 1362
2. Sinninghe Damste et al. Geochem. Cosmochim. Acta., 1995; 59, 1985
3. Daling, Faksness, Hansen, and Stout, Environmental Forensics, 2002; 3, 263  
cf: <http://www.nordicinnovation.net/nordtestfiler/tec498.pdf>
4. Wang and Fingas, Marine Pollution Bulletin, 2003; 47, 423, and references therein

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**Chiron now offers** an **authentic gammacerane standard** in addition to the C31 homohopanes for a **safe identification**. Gammacerane has a completely different MS than the C31 homohopanes and **reference spectra obtained** from the standards are useful for this reason.

**See next page for more details!**

Chiron offers

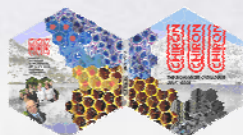
### Gammacerane:

2646,30 Gammacerane 10 µg

### Other Hopanes/Triterpanes available from Chiron:

0615,27	Tm (22,29,30)-Trisnor-17 $\alpha$ (H)- hopane	100 µg
0614,29	17 $\beta$ (H),21 $\alpha$ (H)-30-Norhopane (isoadiantane)	100 µg
1321,29	17 $\alpha$ (H),21 $\beta$ (H)-30-Norhopane	50 µg
1367,29	17 $\alpha$ (H),21 $\alpha$ (H)-30-Norhopane	50 µg
0689,29	17 $\beta$ (H)-28-Norlupane	100 µg
0690,29	17 $\alpha$ (H)/17 $\beta$ (H)-28-Norlupane	100 µg
0613,30	17 $\beta$ (H),21 $\beta$ (H)-Hopane (hopane)	100 µg
0612,30	17 $\beta$ (H),21 $\alpha$ (H)-Hopane (moretane)	100 µg
0132,30	17 $\alpha$ (H),21 $\beta$ (H)-Hopane	100 µg
2179,30	17 $\alpha$ (H),21 $\alpha$ (H)-30-Nor-29-methylhopane	50 µg
2262,30	17 $\alpha$ (H),21 $\beta$ (H)-30-Nor-29-methylhopane	50 µg
0617,30	18 $\alpha$ (H)-Oleanane	100 µg
0618,30	18 $\beta$ (H)-Oleanane	100 µg
0619,30	Friedelane	100 µg
0616,30	Lupane	100 µg
0825,30	Shionane	100 µg
0620,30	Onocerane I	100 µg
0621,30	Onocerane II	100 µg
1192,30	20R/20S-Dammarane	100 µg
1339,31	17 $\alpha$ (H),21 $\beta$ (H)-22R-Homohopane	50 µg
1338,31	17 $\alpha$ (H),21 $\beta$ (H)-22S-Homohopane	50 µg
2255,31	17 $\alpha$ (H),21 $\beta$ (H)-22RS-Homohopane	50 µg
2616,31	17 $\beta$ (H),21 $\alpha$ (H)-22RS-Homohopane	10 µg
2617,31	17 $\alpha$ (H),21 $\alpha$ (H)-22RS-Homohopane	10 µg
2618,31	17 $\beta$ (H),21 $\beta$ (H)-22RS-Homohopane	10 µg
2619,32	17 $\alpha$ (H),21 $\beta$ (H)-22RS-Bishomohopane	10 µg
2620,32	17 $\alpha$ (H),21 $\alpha$ (H)-22RS-Bishomohopane	10 µg
2621,32	17 $\beta$ (H),21 $\beta$ (H)-22RS-Bishomohopane	10 µg
2350,32	Bishomohopane Isomer mixture with 17 $\alpha$ (H),21 $\beta$ (H)-22RS as main compounds	100 µg
2622,33	17 $\alpha$ (H),21 $\beta$ (H)-22RS-Trishomohopane	10 µg
2623,33	17 $\alpha$ (H),21 $\alpha$ (H)-22RS-Trishomohopane	10 µg
2624,33	17 $\beta$ (H),21 $\beta$ (H)-22RS-Trishomohopane	10 µg
2625,34	17 $\alpha$ (H),21 $\beta$ (H)-22RS-Tetrahomohopane	10 µg
2626,34	17 $\alpha$ (H),21 $\alpha$ (H)-22RS-Tetrahomohopane	10 µg
2627,34	17 $\beta$ (H),21 $\beta$ (H)-22RS-Tetrahomohopane	10 µg
2628,35	17 $\alpha$ (H),21 $\beta$ (H)-22RS-Pentahomohopane	10 µg
2629,35	17 $\beta$ (H),21 $\alpha$ (H)-22RS-Pentahomohopane	10 µg
2630,35	17 $\alpha$ (H),21 $\alpha$ (H)-22RS-Pentahomohopane	10 µg
2631,35	17 $\beta$ (H),21 $\beta$ (H)-22RS-Pentahomohopane	10 µg

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- 10 µg quantities are supplied neat in convenient 300 µL micro GC-vials for dilution to 50-100 µg/mL
- 50 and 100 µg quantities are supplied in isoctane (1mL vials)
- The quantities are measured relative to the intensity (TIC) of  $\alpha\beta$ 30 hopane or by gravimetry

Soon available

25,28,30-Trinorhopanes Ts  
28,30-Bisnorhopanes 25-Norhopane