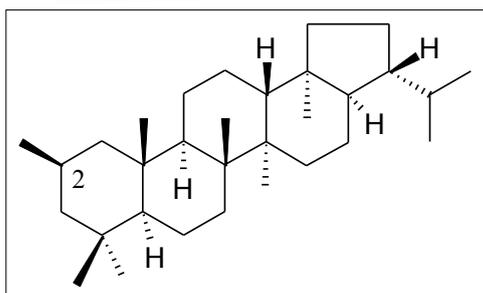
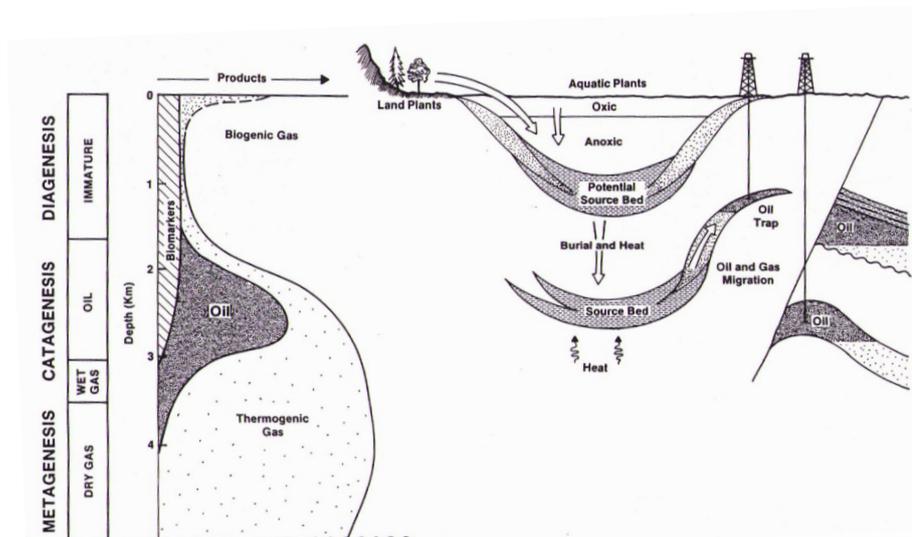
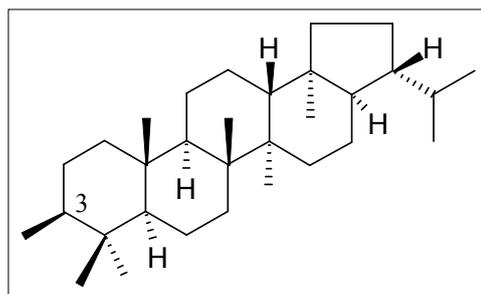


## 2-Methyl and 3-methyl hopanes

Three kind of C<sub>31</sub> methylhopanes have been identified as constituents of ancient sediments and oils. These are 2 $\alpha$ -, 2 $\beta$ -, and 3 $\beta$ -methylhopanes.



8632.31: 2 $\beta$ ,17 $\alpha$ (H),21 $\beta$ (H)-2-Methylhopane



8629.31: 3 $\beta$ ,17 $\alpha$ (H),21 $\beta$ (H)-3-Methylhopane

### Available methylhopans from Chiron:

	<b>2-Methylhopanes</b>
8632.31-10UG	2 $\beta$ ,17 $\alpha$ (H),21 $\beta$ (H)-2-Methylhopane
9077.31-10UG	2 $\alpha$ +2 $\beta$ ,17 $\alpha$ (H),21 $\beta$ (H)-2-Methylhopane (ca 1:3)
	<b>3-Methylhopanes</b>
8628.31-10UG	3 $\beta$ ,17 $\alpha$ (H),21 $\alpha$ (H)-3-Methylhopane
8629.31-10UG	3 $\beta$ ,17 $\alpha$ (H),21 $\beta$ (H)-3-Methylhopane
8630.31-10UG	3 $\beta$ ,17 $\beta$ (H),21 $\alpha$ (H)-3-Methylhopane (purity 93%)
8631.31-10UG	3 $\beta$ ,17 $\beta$ (H),21 $\beta$ (H)-3-Methylhopane
3541.6-KIT	2- and 3-Methylhopanes Kit (8632.31,9077.31,8628.31,8629.31,8630.31,8631.31)

All methylhopanes are supplied as approx. 10  $\mu$ g in convenient 300 $\mu$ L GC-vials for dilution to e.g. 50-100 $\mu$ g/mL (qualitative standard). If not otherwise stated the purity is >95%.



### Origin of methylhopanes

Triterpanoids from the hopane family isolated from living organisms ("biohopanoids") are typically derived from the C<sub>30</sub> 17 $\beta$ ,21 $\beta$  framework. They are the precursors of the many hopanoids encountered in sediments ("geohopanoids") which often possesses the thermodynamically more stable 17 $\alpha$ ,21 $\beta$  configuration and to a lesser extent 17 $\beta$ ,21 $\alpha$ . Methylhopanes are typically present at between 2 and 10% of the abundance of hopanes in oils and rock sources.<sup>1,2,3</sup>

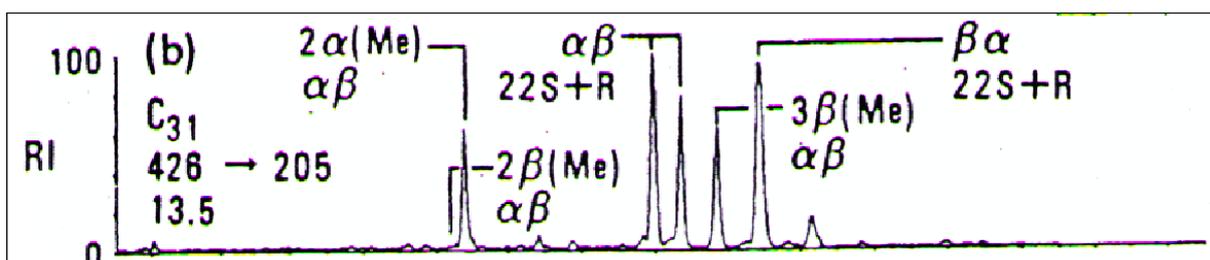
Minor members possessing an additional methyl group attached at position 2 $\beta$  (axial position) or 3 $\beta$  (equatorial position) of the 17 $\beta$ ,21 $\beta$  skeleton have also been isolated from a few bacteria. These are the assumed precursors of the 2-methyl and 3-methyl hopanoids. Because the equatorial alkyl groups are thermodynamically most stable, the fossil hopanes are mixtures dominated by 2 $\alpha$ (Me) and 3 $\beta$ (Me).

In the case of 3-methylhopanoids, only 3 $\beta$ (Me) have been encountered, whereas a mix of 2 $\alpha$ (Me) and 2 $\beta$ (Me) appeared in younger sediments. In more mature sediments, only the 2 $\alpha$ (Me) isomers

### Chromatographic behavior of methylhopanes

Both of the 2-methylhopanes elutes with similar retention time on a non-polar Ultra-1 column. The 2 $\beta$ -methylhopane virtually coelutes with hopane, while 2 $\alpha$ -methylhopane elutes on the trailing side and is incompletely resolved from hopane.

The 3 $\beta$ -methylhopane elutes with a significantly longer retention time and at a point midway between (22R)-17 $\alpha$ (H),21 $\beta$ (H)-homohopane and (22R+22S)-17 $\beta$ (H),21 $\alpha$ (H)-homohopanes. On a moderately polar BP-10 column, the 2 $\beta$ -methylhopane just preceded 2 $\alpha$ -methylhopane and both eluted before 17 $\alpha$ (H),21 $\beta$ (H)-hopane. This observation of a reversal in relative elution positions of hopanes and methylhopanes on columns of different polarities reduces the chance of error in compound identification.<sup>4</sup>



#### Literature:

- 1) P Stampf *et al*: 2 $\alpha$ -Methylhopanoids: First recognition in the Bacterium *Methylobacterium organophilum* and obtention via sulphur induced isomerization of 2 $\beta$ -methylhopanoids; Tetrahedron, Vol 47, No 34, pp 7081-7090, 1991
- 2) R.E. Summons and L.L. Jahnke: Identification of the methylhopanes in sediments and petroleum; Geochimica et Cosmochimica Acta, vol 54, pp 247-251, 1990
- 3) Farrimond P., Talbot H.M., Watson D.F., Schulz L.K. and Wilhelms A. (2004). Methylhopanoids: Molecular indicators of ancient bacteria and a petroleum correlation tool. Geochim. Cosmochim. Acta 68, 3873-3882.
- 4) Biological markers in sediments and petroleum, J.M. Moldowan *et al* (editors), p. 182-200, Englewood Cliffs, New Jersey (1992), Prentice Hall

