

Generation of regular acyclic isoprenoid hydrocarbons in simulation experiments

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It is well known that the distribution of isoprenoid alkanes in crude oil is influenced by maturation, beside the source material and oxidicity. Thermal stability of pristane (pr) and phytane (ph) and their ratios (pr/ph) was observed up to above moderate maturities (reservoir temperature: ~160°C, estimated generation temperature: 165-170°C [1])

As a part of a running project involving the analysis of ~200 crude oils, we carried out various heating experiments [isotherm hydrous pyrolysis (330-370°C) and MSSV (350-530°C) and constant heating rate MSSV (0.1, 0.7, 5°C/min; 350-530°C)] to describe the variation in the distribution (relative abundances of the different chain lengths) of regular acyclic isoprenoid hydrocarbons in the range of iC9-iC20 range.

Preliminary results show that the generation trends of short chain isoprenoids from longer ones are not linear, but increase with increasing temperature. Pr/ph ratios show only some increase in high temperatures ranges and severe cracking at highest ones. The iC10 [2] and (iC16+iC18) vs. pr and ph ([3], were a reliable maturity indicator in the crude oil samples, but did not show strong temperature dependence in the experiments.

In the recent study we compare the products generated in the three types of experiments with the untreated crude oil samples of different maturities.

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