

**METHANE GASES AND THEIR GENETIC RELATIONSHIP TO THE
PETROLEUM SYSTEMS IN THE WEST CARPATHIAN FORELAND, CZECH
REPUBLIC**

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The contact region of the West Carpathians and Eastern Alps with the North European Platform includes the Vienna Basin, Carpathian Foredeep, Alpine Molasse Zone, Carpathian Flysch Belt and the underlying Bohemian Massif. The highest oil and gas production in the Czech Republic is from the autochthonous units of the platform while the overthrust units serve mainly as seal and load which buried source rocks to depth (Picha et al. 2006).

Gas samples were collected from exploration and production boreholes at the well-heads or using deep sampling equipment and analysed for chemical and isotopic composition. The principal source rocks in the region were characterized in previous studies by Ladwein (1988), Francu et al. (1996) and Picha et al. (2006) and include the Upper Jurassic Mikulov Marls, Menilite Formation of the Ždánice nappe and the Triassic of the Alpine/Central Carpathian Mesozoic nappes.

The gas show broad range of wetness and isotopic composition of carbon in methane suggesting mixing of thermogenic oil-associated gases and shallow microbial dry methane. The latter occurs in reservoirs at depth less than 2100 m where the temperature attains 72-75 °C. The increased amount of the microbial methane is observed in reservoirs where infiltration of surface waters occurred at during certain period of time in the geological past.

The increased thermogenic isotopic signature of methane is associated with more recent oil and gas migration from below the Alpine and West Carpathian overthrust to the foreland basin.

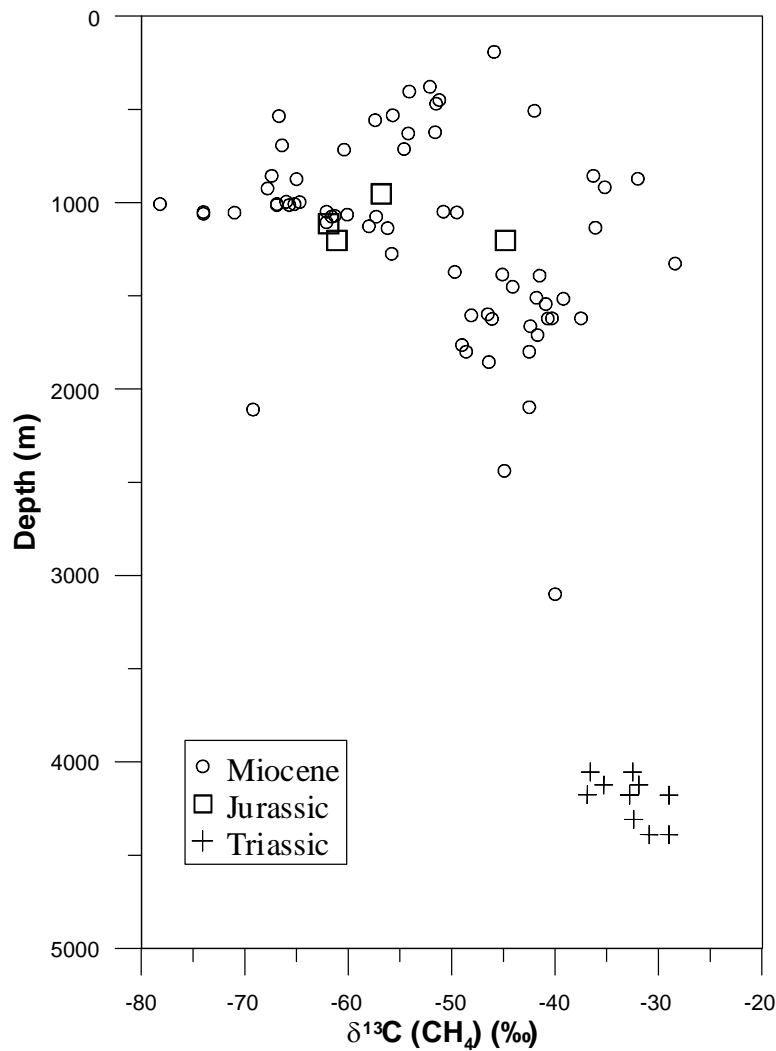


Figure 1. Carbon isotopic composition of methane in gases accumulated in Miocene of the Vienna Basin and Carpathian Foredeep, Jurassic of the Bohemian Massif, and Triassic of the Alpine nappes below the Neogene of the Vienna Basin

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