

OIL FAMILIES IN THE EUPHRATES GRABEN, SYRIA

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The Euphrates Graben is located in the southeastern part of Syria and has about 30 oilfields providing about 75 % of the total oil produced in Syria (Litak *et al.*, 1998). The main two shallow to open marine deposited source rocks in the study area are a) the carbonate Upper Cretaceous Shiranish Formation and b) the clastic Silurian Tanf Formation which are believed to be the main source rock in the Middle East petroleum systems.

The aim of this study is to characterize the oil families in the study area and to specify the effects of source rock age, depositional environment, and maturity on oil distribution and composition.

82 oils (DST samples) produced from over 60 wells across the Euphrates Graben were made available by Shell International for this study. All of the samples were analysed by whole oil gas chromatography to obtain information on the gross composition. Based on aliphatic parameters (CPI, Paraffinicity F, Aromaticity B, Heptane ratio H, Isoheptane ratio I, and Pr/Ph) and using cluster analysis, **seven** oil families were initially distinguished. 30 representative oils were selected and fractionated into saturated hydrocarbons, aromatic hydrocarbons, and nitrogen, sulphur and oxygen (NSO) compound fractions using MPLC. GC-MS analyses were carried out on the saturate and aromatic fractions in order to get preliminary insights into the distributions of biomarkers and polycyclic aromatic hydrocarbons (PAHs), respectively. A compositional dataset on another series of 30 oils was made available by Shell International.

Preliminary results show that the Pr/Ph ratio varies between 0.78 and 1.84 representing three band zones extending from southeast towards northwest, that are compatible with the fault system in the region (Fig.1), which may be related to different oxic and anoxic depositional environments of source rocks. Almost all of the samples show a slight even-over-odd carbon number predominance of the n-alkanes which is normally indicative of a carbonate source rock deposited under reducing conditions. The biomarkers (homohopane index, gammacerane index and Ts/Ts+Tm) and some PAH parameters like the methyl dibenzothiophene ratio (MDR) show that the oils were generated from mixed kerogen

type II+III deposited under saline anoxic conditions and that the source rocks have a Ro equivalent to 0.55-1.1%. Currently, more detailed analyses on biomarkers (GC-MS-MS) as well as low-polarity NSO compounds (GC-MS) are being performed. The results of these investigations will be evaluated and interpreted with the aim to characterise the various oil families in more detail and thus to better understand the petroleum system in the study area.

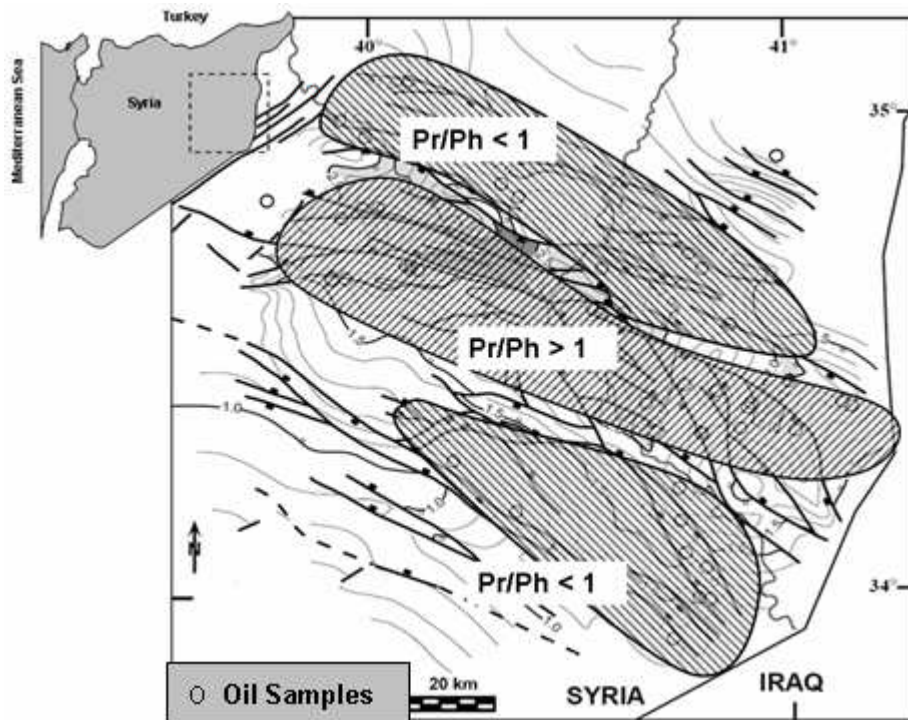


Figure 1. Pr/Ph geographical distribution across the study area.

REFERENCES

- Litak, R.K., Barazangi, M., Brew, G., Sawaf, T., Al-Imam, A., Al-Youssef, W., (1998) Structure and Evolution of the Petroliferous Euphrates Graben System, Southeast Syria. *AAPG Bulletin*, 82(6), 1173-1190.