



## Characterization and Evaluation of Light Hydrocarbon in Northwestern Iranian Crude Oil by Detailed Hydrocarbon Analysis (D.H.A) Gas Chromatography

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### Abstract

Light hydrocarbons are commonly used to evaluate crude oils to determine oil families in reservoirs undergone some kind of alteration process. In this study crude oil contents from Northwestern Iran Delta (samples A, B and C) were analyzed in order to evaluate the Iran Delta petroleum system independent of higher molecular weight markers. Ultra high resolution gas chromatography was used in separation and analysis of the light hydrocarbons. Heptane ratio, invariance, maturity, aromaticity and paraffinicity parameters among the C<sub>7</sub> light hydrocarbons discriminated the oils into two families namely marine and terrigenous and also revealed the Northwestern Iran Delta oils as supermature. Further confirmation of these two sources for crude oils in the Northwestern Iran Delta was obtained from multivariate plots of each crude oil on a star diagram. Sample B and sample C oils were closely matched by their similar path on the star diagram and grossly different from sample A oil which followed a different pattern.

**Key words:** Iran delta, Crude oil, DHA, Light hydrocarbon, Correlation.

### Introduction

Crude oil range hydrocarbons, especially the C<sub>7</sub> compounds, have been widely utilized in petroleum geochemistry studies for determination of oil groups derived from the same source rock, prediction of maturity, alteration of the crude oils and even influence of source rocks [1].

Various secondary processes can alter the

abundance of light hydrocarbons in crude oils. Biodegradation, water washing, thermochemical sulfate reduction, and evaporation can remove light hydrocarbons. Late-stage generation, reservoir cracking, and various migration processes, including phase separation, evaporation, and admixture of condensate, can increase light hydrocarbons [2].

A good knowledge of petroleum system is

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