Evaluation of hydrocarbon generation in source rock using geochemical studies and 1D basin modeling in Kish field, northeast Persian Gulf

Azam Salahshoori[1], Ehsan Hosseiny[1]*, Abdolhamid Ansari[1], Seyyed Hossein Mojtahedzadeh[1]

1- Dept. of Mining and Metallurgical Engineering, Yazd University, Yazd, Iran

* Corresponding Author: Ehosseiny@yazd.ac.ir

Keywords	English Extended Abstract
Hydrocarbon potential generation **Burial history** **Thermal modeling** **Sarchahan Formation** **Kish field**	**Summary** The Kish structure is a huge gas field located in the eastern part of the Persian Gulf. It has a significant amount of gas in Kangan and Dalan reservoirs. This work studies the history of burial and thermal, and the hydrocarbon generation potential of probable source rocks in the Kish gas field. Accordingly, a set of 58 rock samples collection was analyzed for pyrolysis of Rock-Eval 6 and vitrinite reflection. Moreover, the

deepest well was modeled to reconstruct the burial and thermal history. The results indicate that the Sarchahan Formation is the main source rock of this field, and has produced 95% of its potential so far.

Introduction

The Persian Gulf basin is one of the most important regions in terms of hydrocarbon resources in the world. The Kish gas field is located in the eastern part of the Persian Gulf. The purpose of this paper is to assess the hydrocarbon generation potential and to model the burial and thermal history of source rocks in this gas field using Rock-Eval pyrolysis, vitrinite reflection, and a 1D model.

Methodology and Approaches

In this study, 58 rock samples were selected from layers with high natural gamma ray in Pabdeh, Gurpi, Ilam, Lafan, Sarvak, Kazhdumi, Dariyan, Gadvan, Fahliyan, Surmeh, Neyriz, Dashtak, Dalan and Faraghan Formations for Rock Eval pyrolysis and vitrinite reflection. In addition, one-dimensional modeling of burial and thermal history was performed using PetroMod software (2011-Schlumberger) on well B of the Kish field.

Results and Conclusions

The TOC and S1+S2 values vary from 0.16 to 1.59%, and from 0.08 to 4.16 mg HC/g Rock, respectively. Most of the samples have low hydrocarbon potential, only a limited number from Gurpi and Pabdeh show fair hydrocarbon generation potential. The samples with fair potential have kerogen type III and II/III with the low level of maturity. The one-dimensional modeling was performed on Pabdeh, Gurpi and Sarchahan source rocks. The thermal model was calibrated with corrected down-hole temperatures and vitrinite reflections. According to the model, Pabdeh and Gurpi are immature, while the Sarchahan is currently in the gas window. It has reached the oil and gas window since 160 and 120 million years ago, and produced 95% of its potential so far.