

Geochemical comparison of source rock and crude oil and the analysis of hydrocarbon accumulation of T Block in Oriente basin, Ecuador

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This paper analyzes 27 source rocks and 18 oil samples using chemical method, and determines the relationship between crude oil and source rock using correlation method. And also, this paper analyzes the differences of crude oil property in space and determines the cause of the differences. The results show:(1)The source rocks in study area are mainly mudstone and containing lime mudstone, with a certain amount of quartz, calcite and other brittle minerals, clay minerals is mainly illite and smectite mixed-layer minerals. The oil generation indicators and organic abundance of source rocks are mainly good-excellent source rocks. The organic matter type of source rocks is mainly II1 type, with a small amount of type I, II2 and III.(2)The maturity of source rocks is mainly low mature-mature, which has good hydrocarbon generation potential. Source rocks can be divided into two types depositional environment, as the samples of B_ls and LU and UT layer are basically reducing environment, the biogenic is lower aquatic organisms; the samples of the others layers are basically oxidizing environment, the biogenic is higher aquatic organisms.(3)18 crude oil samples are homologous, which are inferred from the Cretaceous marine source rocks basing on biomarker characteristics, are basically reducing environment, water bodies are permanent stratified. The reservoir has experienced two stages filling, the early stage accumulation of crude oil has been biological degraded seriously, the late hydrocarbon contribution can have a major influence on the composition and properties of crude oil. The late stage filling ratio is the major factor in controlling crude oil density.(4)Samples of crude oil are very close to source rocks samples in reducing environment. The source rocks in the study area is not a major contributor to the crude oil of this area, the crude oil is migrated from the west kitchen inside the basin with stronger reducibility and higher maturity.(5)There are two advantage migration pathways of crude oil. The crude oil migrates from the center of the basin to the northeast and divides into two migration pathways in this process. One part crude oil continue to migrate to the northeast region, the other part crude oil migrate toward the southeast region. Relative parameters show that there are two hydrocarbon accumulation period.