Abstract

The Sinop-Samsun Basin is located in the Central Black Sea Continental Margin of Turkey. North of the Sinop-Samsun Basin, there is Western Black Sea Basin and Mid Black Sea High. Basement of the basin is represented by the Pre-Jurassic Paleotethys Ocean remnants. South margin of the basin is restricted by the Neotethys Ocean ophiolites and ophiolitic mélangé of Late Cretaceous. The Sinop- Samsun Basin consists of the Upper Jurassic-Present sediments, nearly 7000 meters thick. The basin formed as a complex basin from passive continental margin and rift basin to arc basins and retro arc foreland basin.

Sinop-Samsun basin is a prospect area of the petroleum exploration. The Lower Cretaceous the Caglayan Formation in the basin has good oil and gas source rock potential and the Lower Eocene the Kusuri formation has moderate gas source rock potential. The basin has oil and gas seeps. The basin has many potential structural traps, which represented by anticlines and thrusts related collisional tectonics. The generated hydrocarbons from those formations may be accumulated the traps in the folds and thrusts. Although thirteen exploration wells were drilled in 1960s to 1980s in the basin, no oil or gas were discovered. The analysis of the drillings suggest that the wells have been drilled near the Ekinveren, Erikli and Ballifaki thrusts, where structurally complex and oil and gas seeps areas. However, unfortunately the exploration wells were not drilled in the most prospect fold traps, especially near the eastern areas.
Petroleum prospects in the fold-thrust zones of the Sinop-Samsun Basin, Central Black Sea Continental Margin of Turkey

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Introduction

The Black Sea Basins are currently an area of increased interest for the petroleum industry. Exploration wells have recently been drilled by Exxonmobil, British Petroleum and Petrobras with Turkish Petroleum Company co-operations. Chevron has exploration license agreement. The Sinop-Samsun Basin in the central Black Sea of Turkey is a prospect area for petroleum exploration. This study analyzes reasons exploration in the basin has been unsuccessful to date and defines potential for future exploration opportunities.
Conclusions

Although sixteen exploration wells were drilled in the Sinop-Samsun basin from the 1960s to 1990, oil or gas has yet to be discovered. Well log assessments suggest that eleven of these wells did not penetrate any potential reservoir due mainly to the 5,000-meter thickness of the Kusuri, Gürsökü and Yemisliçay Formations. Only three wells penetrated potential reservoirs; however, seal rocks in these wells were eroded and traps were disrupted by thrusts. Due to the thick sediments of the Kusuri, Atbaş, Akveren and Gürsökü Formations that were eroded from the anticlines around Kavak and northwest of Bafra, reservoirs of the Çağlayan and İnaltı Formations are prospects for future exploration.

Petroleum Prospects of the Sinop-Samsun Basin

The Late Triassic–Early Jurassic Akgöl and the Lower Cretaceous Çağlayan Formations in the basin have fair to good hydrocarbon source rock potential and the Middle Eocene Kusuri Formation has limited hydrocarbon source rock potential. The basin has oil and gas seeps. There are many large structures associated with compressional tectonics that could be traps for hydrocarbons. Fifteen exploration wells were drilled in the Sinop-Samsun Basin in 1960s to 1990s, but none of them found commercial quantities of hydrocarbons.