

Geological Evolution and Petroleum System of Syria

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In Syria the compressional deformation affected the Arabian Platform since about 25 M.a., while several extensional tectonics and basin openings characterize the Mesozoic pre-collision period. In Paleozoic, extensive erosion processes took place from Upper Ordovician to Permian. Broad shallow marine basins have been identified, where the depositional setting is a clastic-dominated shelf environment. The Triassic rifting in the Palmyrides and the Levant basin dramatically affected and broke up the northwestern Arabian platform. The intracontinental Palmyra rift is the NE extension of the Levant rift that separated the Anatolian Block from Africa in Triassic-Liassic times. In Early Cretaceous, a NNE-trending regional extension dominated associated with the deposition of clastics and magmatism. The following NE-oriented regional extension lasted from Turonian until Early Maastrichtian, with a climax of rifting in Campanian in the Euphrates graben. Following a discrete inversion of the Syrian basins in Late Maastrichtian-Paleocene, the Eocene-Oligocene times were dominated in Levant by a N- to NNE-directed extension. The deformations related with the Arabia-Eurasia collision initiated in uppermost Oligocene in N Syria. The major phase of deformation, associated with a NW-trending compression, developed during the Early Miocene. This led to a platform wide compression, and the inversion in the Palmyrides basin and NW Syria.

The major hydrocarbons fields in Syria are located in the main Mesozoic basins. There is a relationship between the hydrocarbon traps and the main Mesozoic rifts, later inverted during the Cenozoic. In the Palmyrides, Euphrates graben, and Sinjar basin, source and reservoir rocks were deposited during major regional extensional periods. Traps were created in Mesozoic normal fault-blocks, especially in the Euphrates Graben, and/or in Miocene-Pliocene compressional structures such as normal fault-inversions, fault propagation folds and anticlines. Source rocks have been recognized in many formations ranging in age from Ordovician to Eocene. The most likely are Late Paleozoic to Triassic shales (Palmyrides, Euphrates, Sinjar), and Late Cretaceous marly formations (Euphrates, Sinjar). Reservoir rocks are sandstone of Late Paleozoic and Mesozoic age (Euphrates, Palmyrides), and Mesozoic-Cenozoic fractured carbonates (Palmyrides, Aleppo Plateau, Sinjar). These reservoirs are sealed by Mesozoic-Cenozoic shales or evaporites.