
Depositional Environment and Diagenesis of the Fahlyian Formation Southwest of Iran

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The Fahlyian formation (Neocomian) is one of the petroleum reservoir rocks in Southwest Iran. It spreads all over Fars province and also northeast of Khuzestan and Lorestan provinces. In this research the Fahlyian formation has been studied in two sections in Khuzestan province: 1) Subsurface section (Haftkel-61 well) in 8km northwest of Haftkel oil-field. 2) Outcrop section (Kuh-e Mungasht, Tang-e Malagha) in 30km east of Izeh city. Each section has a thickness of 450m. According to microscopic studies and wireline well logs (Gamma ray and Norton), four facies belts were recognized in this formation: Tidal flat facies belts consist of pelloid, ooid, pelloid-ooid, bioclast-pelloid, bioclast-ooid and intraclast-ooid grainstones, stromatolite bounstone and lime mudstone. Lagoon includes bioclast, pelloid, bioclast-pelloid, intraclast-pelloid and bioclast-intraclast packstone, bioclast and algal wackstone and fossiliferous lime mudstone. Barrier contains ooid, pelloid, ooid-pelloid, intraclast-ooid and algal grainstone, lithocodium and coral boundstone. Open marine is made of lime mudstone, bioclast wackstone, shale and resedimented carbonates (calciturbidites). Vertical and lateral facies changes suggest that the Fahlyian formation was deposited in a transgressive and deepening basin. Based on depositional features a shallow, distally stipend carbonate ramp was suggested for the Fahlyian formation. Most important diagenetic processes recognized in this formation are; cementation, micritization, neomorphism, dolomitization, dissolution and compaction. Among them dolomitization and dissolution seem to have enhanced reservoir quality.
