Mexican Offshore Carbonate Reservoir Types

Colin Stabler[1]

[1]Consulting Geologist, Mexico City

Abstract

The productive carbonates offshore Mexico have a broad range of reservoir types based on the relative importance of the porosity of the rock matrix, vugs/caverns and fractures. These in turn are related to the depositional environment and later diagenesis.

Upper Jurassic oolitic shoal deposits show grain lixiviation and dolomitization giving good matrix porosity reservoirs. In the south, these dolomites are intensely fractured which improves their permeability. Lower Cretaceous shelf margin limestones have matrix and vuggy to cavernous porosity.

Upper Cretaceous deep water dolomitized carbonates have poor matrix porosity but can be productive when highy fractured.
The Upper Cretaceous breccia debris flows are often dolomitized and highly fractured. These reservoirs have matrix, vuggy and fracture porosity and high permeability.

These distinct reservoir types can be portrayed on a triangular diagram with end member matrix, vuggy and fracture porosity at the apices. The fractured dolomitized breccias are a combination of all three porosity types. They are the most prolific producers in offshore southern Mexico. Carefull petrographic analysis needs to be undertaken to better characterise the carbonate reservoirs in offshore Mexico for input in development and re-development models for the investment opportunities that are opening up.