University of Barcelona

Master of Geology and Geophysics Reservoir

Master Research Project

Investigation into the Relationship between Geological attributes and Petrophysical parameters to define Carbonate Reservoirs quality at core scale for global trends and a special focus on the Middle East in the Cretaceous.

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Abstract

Prediction of reservoir quality and control flow in heterogenic carbonate reservoirs is one of the most challenging tasks that geoscientists engaged into reservoir characterization face most of the time. This study focus on finding general trends that allow to identify particular behaviors of the geological, petrophysical, and diagenetic attributes in certain locations, depositional environments, and ages.

To achieve this, Resqual beta version database was created as an analytic / statistical center resource where parameters previously mentioned are available. Multiple correlations between geological and petrophysical attributes are achievable by discriminating information according to the data set available. Also, two specific cases from the Cretaceous are presented herein to show the advantages that offer preliminary correlations and how they are linked to more specific geological and diagenetic parameters. Diagenetic effects are considered in the study because have a profound influence in all carbonate reservoirs. One of the most important criteria used to analyze such effects was the pore type. Results obtained in the two studied fields of the Cretaceous age, highlight that diagenesis is the major factor controlling flow in the reservoir as well as reservoir quality (in certain cases).

Other results presented in this study show that petrophysical trends are at times not visible and it is possible such trends have a major impact on case studies correlated through Resqual beta version database. However, those correlations allow having a first look about distribution of lithology, texture, and pore types. All correlations generated by means of this database are of interest in the study of carbonate reservoir because provide a preliminary idea about possible factors that can affect the reservoir.