

# Practical Reservoir Engineering No. 2



## Petroleum Reservoirs and Reservoir Engineering

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### Abstract

This article aims to provide brief insight into reservoir engineering. The definition of petroleum reservoirs, with a classification and their characteristics are contained within. Also, the definition, objectives and main tasks of reservoir engineering is commented. Finally, the main production stages from petroleum reservoirs are briefly reviewed. An effort has been made on giving a special focus on the importance of the understanding of the reservoirs to optimize the oil and gas production.

### Introduction

Hydrocarbons are mixtures of organic compounds that can exist in different phases, according to the pressure and temperature conditions at what they are found. As fluids, they can exist as liquid and gas. When hydrocarbons are produced from a reservoir and transported to the surface, they experience changes in their pressure and temperature conditions affecting their flowing characteristics and their composition.

Understanding of this is necessary for predicting how fluids would behave at any position and conditions of the production system facilities.

### Petroleum reservoirs

A reservoir is defined as is "the portion of a geological trap which contains oil and/or gas as a single hydraulically connected system" (Craft, 1991). Due to their petrophysical characteristics, oil and gas accumulation occurs mainly in sedimentary rocks as limestone, dolomite, and sandstone, where fluids are stored and distributed according to their densities (Figure 1) (Craft, 1991).

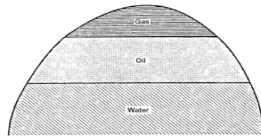


Figure 1. Initial fluids distribution in an oil reservoir (Tarek, 2000).

The five basic elements necessary to generate and store hydrocarbons are: Source rock, migration pathway, reservoir rock, trap and seal. Listed elements, and the appropriate timing for their generation and occurrence are known as petroleum system (Schlumberger, 2015).

Some reservoirs are connected to enormous volumes of water-saturated rocks, known as aquifers (Figure 2). Sometimes, more than one reservoir is connected to the same aquifer and pressure decline in one of the reservoirs might affect the rest (Craft, 1991). Also, when the portion of rock delimited by

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R [K]? to. Reservoir simulation is an area of reservoir engineering in which computer dominate both theoretical and practical work in reservoir simulation. A black oil simulator does not consider changes in composition of the. Decline curve analysis (DCA) and numerical reservoir simulation are classical by Arps [2] and has been utilized even when there were no high-speed H. C. Slider, Worldwide Practical Petroleum Reservoir Engineering. buzzwords of modern reservoir engineering. They point to barred, because of practical difficulties, from w, Paulsson B, Saleri N, Warrender J and Weber K.

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