Recent Advances in
Petrochemical Science
ISSN: 2575-8578

Juniper Publishers
key to the Researchers

Mini Review
Volume 1 Issue 1 - April 2017
DOI: 10.19080/RAPSCI.2017.01.555555

Recent Adv Petrochem Sci


# The Relationship between Carbonate Reservoir Unit Features and Well Test Double Logarithmic Curves

**Dapeng G[1]*and fangfang C[2]**

[1]*Institute of Mechanics, Chinese Academy of Sciences, China*

[2]*Research Institute of Exploration and Development, Tarim Oilfield Company, China*

**Submission:** April 08, 2017; **Published:** April 26, 2017

***Corresponding author:** Gao Dapeng, Institute of Mechanics, Chinese Academy of Sciences, Beijing 100190, China, Tel: +86-01-083595191; Fax: +86-01-083595191; Email: gaodapeng2009@163.com

## Introduction

Naturally fractured-vuggy carbonate reservoirs have various type so f units, and making full use of the well test data to study reservoir characteristics is the quit important to enhance oil production. The classification of the reservoir units and identification methods are analyzed. Combination of the results interpreted by multiple medium model and radial composite model, the well test double logarithmic curves are divided into five types corresponding to different reservoir unit's characteristics.

a. The oil well does not drill in any fractured-vuggy unit, but abundant fractured-vuggy units exist in the reservoir.

b. The oil well drill in the fractured-vuggyunits and many fractured-vuggy units exist in the reservoir.

c. The oil well drill in multiple connected water-eroded caves.

d. Carbonate reservoirs contain primarily matric.

e. The oil well drill in some individual water-eroded caves, but the fractured-vuggy reservoir does not develop.

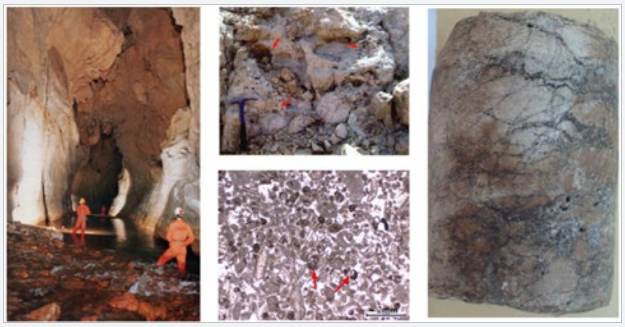

**Figure 1:** Fractured - vuggycarbonate reservoir detection, outcrop and core schematic diagram.

The measured data of 65 Wells in HalaHatang block is classified and summarized, and we find that well test curves is given priority to type I and II, accounted for 26.2% and 53.8% respectively. Two kinds of curves are different because the location relationship between the well and the fractured-vuggy units, so the large scale fractured-vuggy units and their interferences determine the flow of reservoir [1-2] (Figure 1).

Naturally fractured - vuggy carbonate reservoirs, quite developed in Tarim basin, are given priority to with caves, fracture and pore structure. One fractured vuggy unit is composed of one or more interconnected reservoir bodies, and has a uniform pressure and fluid system of reservoir. Well test is widely used to obtain reservoir parameters. Because of well test of strong, parameter interpretation must always be combined with static data, using the data of other constraints on well test interpretation. According to the study of the characteristics of block within a large number of well test curves can be divided into several different types, and then can be according to the classification results summarized well test curve and the corresponding relation of reservoir characteristics. Classification has the role of two aspects: on the one hand, can use classification to find out the laws governing the process of well test interpretation, reduce the uncertainty of well test interpretation. On the other hand, establish the well test curve corresponding relationship and reservoir geological characteristics, can be very intuitive judgment through test curve form the basic characteristics of reservoir.

Many scholars studied the carbonate reservoir well test models in recent years, a lot of work propose a carbonate reservoir description fractured - vuggy triple porosity model. The existing carbonate well test models are divided into double porosity model, double and triple medium permeability model, and the factors affecting the reservoir in the form of curve are analyzed. In order to solve the well test interpretation of bottom water carbonate reservoir, one [3]. Doil-water two

phase numerical well test model of bottom water double pore carbonate reservoir is established. According to the actual geological data in Tahe oil field, a single-phase flow well test interpretation model of triple medium reservoir is established, and a genetic algorithm is proposed for fractured-vuggy reservoir on fitting well test interpretation methods. The comprehensive analysis of well test theory according to the fractured - vuggy carbonate research data, and the main characteristics of this reservoir well test curves are summarized. Combined with the single-well static data and production characteristics, the reservoir percolation medium types can be divided into initial matrix skeleton, constant volume cavity, and double medium and beaded reservoir.

Tarimoil field's well test curves mainly contain type I (26.2%) and type II (53.8%), caused the main reason that the different two types of curve is the relationship between the well and the location of the joint body piercing. The seam of large scale body piercing determines the seepage law of reservoir. For a type I curve characteristics of the wells can be appropriately selecting fracturing, acidizing process, communication with the seam around the hole, in order to gain a higher capacity. When seam hole Wells in the unit well test curve type I and III I characteristics, should be in the later production deployment of injection wells in order to complement formation energy, make it get longer stable production period. In addition corresponding reservoir fracture development of well test curves (III, IV) proportion reaches 14% that has certain mutual interference between seam body piercing.

## References

1. Mao C, Zhong JH, Li Y, et al. (2014) Ordovician carbonate rock matrix fractured-porousreservoir in Taheoilfield[J]. Pet Explor Dev 41(6): 681-689.
2. Li Y (2013) The theory and method for development of carbonate fractured-cavity reservoirs in Taheoilfield [J]. Acta Pet Sinica 34(1): 115-121.
3. Camacho VR, Vasquez CM, Castrejon AR, Rafael CA, Ortiz VA, et al. (2005) Pressure transient and decline curve behaviors in naturally fractured vuggy carbonate reservoirs [J]. SPE Reservoir Evaluation and Engineering 8(2): 95-112.


**DOI:** 10.19080/RAPSCI.2017.01.555555




**How to cite this article:** Dapeng G, fangfang C.The Relationship between Carbonate Reservoir Unit Features and Well Test Double Logarithmic Curves. Recent Adv Petrochem Sci. 2017; 1(1): 555555. DOI: 10.19080/RAPSCI.2017.01.555555.