Physical Formulation and Mathematical Analysis of the Production Decline Curve in Calculation of the Decline Rate for Oil Fields

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Abstract:

The study of fluid filtration in porous media, the different stages in which production passes during the exploitation of oil and gas-bearing fields, the mechanisms in which fluid filtration occurs in porous spaces, as well as the pressure (energy) in the reservoir, which also determines the stage in which the underground reservoir of oil and gas has passed, are the main parameters in the application of many calculations in reservoir engineering. In this paper, the decline analysis method is reflected, specifically in the determination of the Production Decline Rate by analyzing each formula that corresponds to each of the types of decline, including Exponential Decline, Harmonic Decline and Hyperbolic Decline. The main objective of this paper is to present a link between the physical context and the mathematical analysis of production decline curves during a certain time period of the exploitation of underground oil and gas reservoirs, helping to determine the production decline rate.

Keywords:

Reservoir, Pressure, Decline Rate, Producing Life