World Academy of Science, Engineering and Technology
International Journal of Chemical and Materials Engineering
Vol:18, No:06, 2024

Reservoir Fluids: Occurrence, Classification, and Modeling

Authors : Ahmed El-Banbi

Abstract : Several PVT models exist to represent how PVT properties are handled in sub-surface and surface engineering calculations for oil and gas production. The most commonly used models include black oil, modified black oil (MBO), and compositional models. These models are used in calculations that allow engineers to optimize and forecast well and reservoir performance (e.g., reservoir simulation calculations, material balance, nodal analysis, surface facilities, etc.). The choice of which model is dependent on fluid type and the production process (e.g., depletion, water injection, gas injection, etc.). Based on close to 2,000 reservoir fluid samples collected from different basins and locations, this paper presents some conclusions on the occurrence of reservoir fluids. It also reviews the common methods used to classify reservoir fluid types. Based on new criteria related to the production behavior of different fluids and economic considerations, an updated classification of reservoir fluid types is presented in the paper. Recommendations on the use of different PVT models to simulate the behavior of different reservoir fluid types are discussed. Each PVT model requirement is highlighted. Available methods for the calculation of PVT properties from each model are also discussed. Practical recommendations and tips on how to control the calculations to achieve the most accurate results are given.

Keywords : PVT models, fluid types, PVT properties, fluids classification
Conference Title : ICOGPE 2024 : International Conference on Oil, Gas and Petrochemical Engineering
Conference Location : Montreal, Canada
Conference Dates : June 13-14, 2024