Contribution ID: **408** Type: **Oral Presentation**

A New Precise Correlation for Permeability Estimation of Tight Carbonate Rocks Using Mercury Intrusion Porosimetry (MIP) Data

Tuesday, 31 May 2022 16:45 (15 minutes)

There has been a long-standing concern with the estimation of permeability, particularly in tight carbonate reservoirs. So far, scholars have proposed several empirical correlations for permeability assessment, but the need for a correlation to provide reliable predictions for tight carbonate reservoirs is still felt. In this study, we aim to present a correlation for permeability estimation, based on the results of mercury intrusion porosimetry (MIP) tests and that improves the reliability of the estimation in comparison to regularly-used existing correlations. For this purpose, an extended series of regression analyses, on MIP data of 75 tight carbonate rock samples (selected from a pool of 250 rock samples due to their small pore throat sizes), was performed to find a promising relationship between permeability and the porosity, pore throat sizes of rocks, and a newly-defined dimensionless threshold capillary pressure (Pdt) coefficient. In tight carbonate rocks, the pore throat size range falls below 1 μm, and those corresponding to lower mercury saturations act as predictors. Among them, we used pore throat radii corresponding to a mercury saturation of 10% (r10) as the optimum radii in our correlation, and MIP data of 25 rock samples were used to validate the suggested equation. We demonstrate the superiority of the suggested equation against other regularly-used empirical equations in the permeability estimation of dense carbonate rocks. Thus, this equation can be utilized to accurately predict the rock permeability of dense reservoirs using easily accessible data obtained from tests performed on inexpensive drill cuttings.

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Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

Online

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