Partitioning model study of the traction coefficient in a droplet model in a wellbore

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July 20, 2023

Abstract

At present, the main way to deal with the gas well effusion is to use the over-effusion prediction model to calculate the critical fluid carrying velocity and other factors, which provides data support and theoretical basis for the drainage process, so as to achieve the effect of bringing the effusion out of the wellbore. When the prediction results of the hydrops prediction model are biased, hydrops will be generated at the bottom of the wellbore, resulting in a decrease in gas well productivity. Aiming at the problem that the drag coefficient of the wellbore droplet movement model changes greatly in the process of natural gas production, which leads to the error of the wellbore effusion prediction, the commonly used droplet models and the common drag coefficient models are analyzed and evaluated. Considering that the fitting method of the commonly used drag model has different applicability for each Reynolds number region, the literature review, calculation and verification methods are used. The area with the highest fitting accuracy of each method is divided and sorted, and the model is selected. Compared with the model obtained by the partition and the existing drag model and the experimental value, it is found that the model can effectively reduce the average error rate between the calculated results and the experimental value, and can be better applied to the turbulent area and the highly turbulent area, and is more consistent with the actual working condition.

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