عنوان مقاله:

Population Balance Model for Separation of Water in Crude Oil Emulsion in Batch Gravity Coalescer

محل انتشار:

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خلاصه مقاله:

Crude oil consists of various contaminants such as salt water, gas and sediment that should be separated. In the process of separation, water droplets must be separated from crude oil. In this research, a mathematical model for separating water emulsion droplets from crude oil is presented. As a result of the population balance, a differential integral hyperbolic nonlinear equation was obtained and the terms of its population balance integrals was simplified using the fixed pivot method. The partial differential equation (PDE) obtained by the method of line was converted into a group of ordinary equations (ODE). The group of equations (ODE) was solved using MATLAB software. As a result, the profile of the volumetric distribution of water droplets, the average diameter of droplets, the rate of separation of water along the height of the system at different times is plotted. The results of the model were compared with water-oil laboratory data for water emulsions in oil.

کلمات کلیدی:

gravity separation, emulsion, sedimentation, droplet size distribution, Demulsifier, Population Balance Equation

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