عنوان مقاله:

Simulation of Liquid-Gas Two-phase Flow in Inclined Pipes

محل انتشار:

هشتمین کنفرانس ملی کاربرد CFD در صنایع شیمیایی و نفت (سال: 1396)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

The prediction of pressure gradients, liquid hold up and flow patterns occurring during the simultaneous flow of gas and liquid in pipes is necessary for designing well tubing and flow lines in the petroleum and chemical engineering. The flow may be vertical, inclined (upward or downward) and horizontal; and methods must be available for predicting pressure drop in pipes at any operational parameters including pipe and fluids properties. The engineer must be able to calculate liquid hold-up in the pipelines at various flow conditions in order to calculate such things as mixture density, actual gas and liquid viscosities, effective viscosity and heat transfer and as a result to design separation and slug catching facilities. The objective of this research is to develop a COMSOL mechanistic model for simulation of gas-liquid two-phase flow and use the experimentally validated model to provide thorough insight and understanding of the effect of different operational parameters such as inlet gas/liquid ratio, flow rate and flow inclination angle on the liquid hold up and pressure drop along the pipe. These multiphysics simulations can be used for understanding pertinent affecting parameters and designing real experiments.

کلمات کلیدی:

two phase turbulent flow, liquid holdup fraction, phase field method, inclined pipes