عنوان مقاله:

Modeling friction factor in Annular Slug flow in inclined pipes by genetic algorithm

محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

تعداد صفحات اصل مقاله: 7

نویسندگان:

Reza Nobakht Hassanlouei - *Computer Aided Process Engineering lab, CAPE, School of Chem. Eng.,Iran University of Sci. & Tech., IUST, Tehran, Iran*

Hasti Firouzfar - *Computer Aided Process Engineering lab, CAPE, School of Chem. Eng.,Iran University of Sci. & Tech., IUST, Tehran, Iran*

Sara Akhtari - *Computer Aided Process Engineering lab, CAPE, School of Chem. Eng.,Iran University of Sci. & Tech., IUST, Tehran, Iran*

n Kasiri - *Computer Aided Process Engineering lab, CAPE, School of Chem. Eng.,Iran University of Sci. & Tech., IUST, Tehran, Iran*

خلاصه مقاله:

Two-phase flow transportation through pipelines located in hilly terrain is commonly encountered in the process industry. Because of the problems associated with oil and gas production offshore, it is usually necessary to have a common pipeline for the liquid and the gas streams. In gatheringsystems set up for oilfields, two-phase mixtures must be transported from the wells to the separation facility. In this study, two-phase flow of annular slug pattern was created to enablemeasurement of pressure drop in an inclined pipeline of an upward inclination angel 0 to 40o. A test section of 30mm diameter and of 3m length made of plexy-glass was used in the experimental setup. The superficial gas velocity was kept constant at preset values of 20 and 40 lit/min over theexperimentation period. The liquid superficial velocity was changed from 80 to 1000 lit/hr whilethe pipeline inclination was varied at 5o steps over the 40o range. Pressure drop was measured after the flow had become fully developed into an steady state condition.A mixed trigonometricfunction and power series was introduced to provide the friction factor functionality in Fr, Re and θ. A genetic algorithm routine was used to determine the optimal function parameters. The model developed was examined against experimentally measured data and good agreement was recorded with less than 0.012 mean error

کلمات کلیدی:

Pressure drop, Friction factor, Flow pattern, Two phase flow, genetic algorithm