

RESEARCH PAPERS

水平长直管内油水两相流流动特性实验研究

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 The flow patterns and their transitions of oil-water two-phase flow in horizontal pipes were studied. The experiments were conducted in two kinds of horizontal tubes, made of plexiglas pipe and stainless steel pipe with 40 mm ID respectively. No. 46 mechanical oil and tap water were used as working fluids. The superficial velocity ranges of oil and water were: 0.04-1.2 m.s⁻¹ and 0.04-2.2 m.s⁻¹, respectively. The flow patterns were identified by visualization and by transient fluctuation signals of differential pressure drop. The flow patterns were defined according to the relative distribution of oil and water phases in the pipes. Flow pattern maps were obtained for both pipelines. In addition, semi-theoretical transition criteria for the flow patterns were proposed, and the proposed transitional criteria are in reasonable agreement with available data in liquid-liquid systems.

关键词 [oil-water two-phase flow](#) [horizontal pipe](#) [flow pattern](#) [transition criterion](#)

分类号

DOI:

An Experimental Study on the Flow Characteristics of Oil-Water Two-Phase Flow in Horizontal Straight Pipes

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Received Revised Online Accepted

Abstract The flow patterns and their transitions of oil-water two-phase flow in horizontal pipes were studied. The experiments were conducted in two kinds of horizontal tubes, made of plexiglas pipe and stainless steel pipe with 40 mm ID respectively. No. 46 mechanical oil and tap water were used as working fluids. The superficial velocity ranges of oil and water were: 0.04-1.2 m.s⁻¹ and 0.04-2.2 m.s⁻¹, respectively. The flow patterns were identified by visualization and by transient fluctuation signals of differential pressure drop. The flow patterns were defined according to the relative distribution of oil and water phases in the pipes. Flow pattern maps were obtained for both pipelines. In addition, semi-theoretical transition criteria for the flow patterns were proposed, and the proposed transitional criteria are in reasonable agreement with available data in liquid-liquid systems.

Key words [oil-water two-phase flow](#); [horizontal pipe](#); [flow pattern](#); [transition criterion](#)

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