

ABSTRACT

Two-phase flow is a stream of the most simple of multiphase flow. Multiphase Flow simultaneous flow is flowing in a pipe more than one phase (form/shape) fluid (liquid-gas, solid-liquid, solid-liquid-gas). The basic characteristics of the flow of the two phases include flow pattern, flow pattern maps, the fraction vacuum, and pressure gradient. This research discusses the investigation of pressure gradient flow in two phases. In the medical field, a pressure gradient is used to know the system pressure difference the flow of blood and sperm.

In doing this research the used fluid air-water mixture and Glycerin with concentrations of 0%, 10%, 20% and 30% in the capillary pipe with a diameter of 1.6 mm. This research was conducted to find out the influence of superficial gas velocity (J_G) = 0-66.3 m/s or superficial velocity of liquid (J_L) = 0,033-4,935 m/s and the influence of the viscosity of the mixture against the pressure gradient. To get the data pressure gradient using a pressure transducer (PT) connected with the side in and out on the side of the test section. Then PT is connected with a number of data acquisition on the channel change the analog data into digital data in the form of graphs.

On the results of the investigation, the pressure gradient is influenced by the amount of superficial gas velocity (J_G) and liquid superficial velocities (J_L). Experience increased pressure gradient due to the influence of the J_L on the range 0.091; 0.539 and 0.879 m/s by varying the J_G (0 – 66.3) m/s and experience increased pressure gradient due to the influence of J_G at 0.066 range; 3 and 22.6 m/s by varying the J_L (0.033 – 4.935) m/s. Viscosity also affects the pressure gradient, from data research results on GL 0%, 10%, 20%, and 30% by varying the J_G = 0.066 m/s and J_L = 0.149 m/s pressure gradient value increases due to the increase in the viscosity of the mixture of water and Glycerin.

Keywords: two-phase, pressure gradient, capillary pipe, superficial velocity, viscosity