ABSTRACT

Two-phase flow is found in everyday life as well as in the field of industry. The flow of two-phase consists of 3 phases namely liquid-solid, gas-liquid and gas-solid. The basic characteristics of the two-phase flow include flow pattern and flow pattern maps, void fraction, and pressure gradient. This research will discuss the pressure gradient. In medicine, a pressure gradient is used to find out the difference of the pressure system of the blood flow in the human body. Some problems of the pressure gradient are the superficial velocity and viscosity of the fluid mixture flow.

This research uses a capillary pipe with a diameter of 1.6 mm. The fluid used was an air-water mixture and glycerin with a presentation of 40%, 50%, 60%, and 70%. This research was conducted to find out the effect of superficial gas velocity (J_G) and liquid (J_L) and the effect of viscosity on the pressure gradient. The data is measured with a pressure gradient using a pressure transducer.

The result of this research shows that the value of the pressure gradient is affected by the amount of liquid or gas superficial velocity. Pressure gradient will increase due to the effect of J_L with the range 0.15; 0.88; 2.30 [m/s] and variations of J_G 0-66.3 [m/s]. Pressure gradient also increased due to the effect of J_G with a range of 0.07; 7.00; 22.60 [m/s] and variations of the J_L 0.03-4,94 [m/s]. Apart from superficial velocity, viscosity value of the mixture of water and glycerin also effect on pressure gradient. On the GL 40%, 50%, 60% and 70% with J_G = 0.066 [m/s] and the J_L = 0.7 [m/s] indicates an increase in the value of the pressure gradient due to the increase in the viscosity of the mixture of water and Glycerin.

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