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Pengaruh viskositas terhadap pola aliran dan penurunan tekanan aliran dua fase udara-cairan searah ke atas pada pipa vertikal

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Abstrak

Two phase flow is a part of multi-phase flow that is distinguished according to its phase (liquid-gas, solid-liquid, and gas-liquid), flow direction (cocurrent and counter current), and pipe orientation (horizontal, vertical, and inclined). The objectives of this research were to observe pressure drop and visualization of the flow at test section. The experiment test was conducted for constant liquid velocity and variable gas velocity, at constant gas velocity and variable liquid velocity conditions in vertical upward gas-liquid two-phase flow.

The research was conducted by using a transparant pipe (plexiglass) with diameter of 24 mm, air dan liquid (pure water u = 0,98E-3 Pa.s, solution of CMC u = 2,3E-3 Pa.s and 4,7E-3 Pa.s) as working fluids. The flow pattern was observed at JL= 0,007 m/s to 0,003 m/s, whereas JG was between 0,005 m/s to 0,1 m/s at air pressure of 1 atm and temperature of 27° C - 29° C.

The result shows that the change of JG, JL and viscosity influence the pressure drop and flow pattern. Pressure drop increased with the increase of JL under the constant JG. Meanwhile the pressure drop decreases with the increase of JG under the constant JL. It were found that pressure drop increases with the increases of liquid viscosity and the flow pattern transitions strongly depend on the liquid viscosity.