HEAT and MASS TRANSFER of FALLING FILM EVAPORATOR for NIRA SOLUTION WITH AIR SYSTEM

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ABSTRACT
Evaporator is used mostly by chemical industries, especially by food and medicine industries for thickening fluids which are sensitive to heat. One of the ways to improve falling film evaporator is by blowing air to decrease. Vapor pressure, so that boiling point of the solution will decrease. The research aims at knowing the influence of feed flow on heat transfer coefficient, the influence of concentration on heat transfer coefficient as well as the influence of air flow acceleration on lowering solution boiling point.

In this research, 2 meter long upright column having inner diameter of 28 mm and outer diameter 34 mm was used, after that Nira solution having different concentration was distributed through over flow weir distribution, wetting the whole column and then it was contacted with hot air from opposite direction in the column. The variables used in this research are liquid flow acceleration of 20 l/hour, gas flow acceleration of 0, 1, 2, 4 and 6m$^3$/hour and bait solution concentration of 1% up to 2%.

Big acceleration of liquid bait flow liquid will make the flow more turbulent and heat transfer coefficient bigger. Result of which is obtained indicate that ever greaterly of rate of flow of liquida hence is ever greater of coefficient transfer of heat, on the contrary condensed progressively condensation concentration bait smaller coefficient transfer of heat. While air rate of flow have an effect on big in degrading dot boiled.

Key words : falling film evaporator, laminar, turbulence, heat transformation coefficient, empirical coo relation